UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

APR 16 2013

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA), we enclose for your review the Final Environmental Impact Statement (FEIS) for Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP) RIN 0648-BD17.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA proceeding with Amendment 5. The purposes of Amendment 5 to the Atlantic Herring FMP are to: (1) Improve the catch monitoring program for the limited access herring fishery; (2) address river herring bycatch in the herring fishery; (3) establish criteria for midwater trawl vessel access to groundfish closed areas; and (4) adjust other aspects of the fishery management program to keep the Herring FMP in compliance with the Magnuson-Stevens Act (MSA).

If implemented, the measures recommended by the New England Fishery Management Council in Amendment 5 would:

- Revise regulatory definitions for transfer at-sea and offload;
- Revise administrative/general provisions to enhance the fishery management program;
- Revise the pre-trip and pre-landing notification requirements for limited access herring vessels;
- Revise reporting requirements for federally-permitted dealers;
- Create a new open access permit with a 20,000-lb herring possession limit for limited access mackerel vessels fishing in Herring Management Areas 2/3;
- Increase observer coverage on Category A and B herring vessels with industry-funded measures to be developed in the upcoming year ;
- Implement management measures to improve/maximize sampling at-sea;
- Implement management measures to address net slippage (i.e., dumping of catch as sea before sampling by observers);
- Support river herring bycatch avoidance program developed in cooperation with the fishing industry;
- Create a mechanism to establish a river herring catch cap; and
- Establish provisions to require enhanced sampling and 100 percent observer coverage on all midwater trawl vessels fishing in all of the groundfish year-round closed areas;

Additional copies of the FEIS may be obtained from the Responsible Program Official identified below. The document is also accessible electronically through NOAA's National Marine Fisheries Service's Northeast Regional Office website at http://www.nero.noaa.gov/nero/.

Printed on Recycled Paper

Written comments should be submitted through mail, facsimile (fax), or email to the Responsible Program Official identified below. Written comments submitted during the agency's 30-day public comment period must be received within 30 days of the date of publication in the Federal Register.

When submitting fax or email comments include the following document identifier in the comment subject line: Comments on Amendment 5 to the HER FMP.

Responsible Program Official:

John K. Bullard
Regional Administrator
Northeast Regional Office
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA, 01930
Telephone: 978-281-9250
Facsimile: 978-281-9135
HERAmendment5@noaa.gov

Sincerely,



Patricia A. Montanio
NOAA NEPA Coordinator

Enclosure

VOLUME I

AMENDMENT 5

to the
Fishery Management Plan (FMP)
for
Atlantic Herring



Including a
Final Environmental Impact Statement (FEIS)

Prepared by the
New England Fishery Management Council

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

Date Submitted (NEFMC Final): March 25, 2013

Intentionally Blank

AMENDMENT 5 TO THE ATLANTIC HERRING FISHERY MANAGEMENT PLAN

Proposed Action: Adoption and implementation of management measures to adjust the fishery management program for the federally-managed Atlantic Herring fishery through Amendment 5 to the Atlantic Herring FMP

Type of Statement: Final Environmental Impact Statement (FEIS)

Responsible Agencies:

New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

For Further Information:

Tom Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, Massachusetts 01950
Phone: (978) 465-0492
Fax: (978) 465-3116

Abstract:

The New England Fishery Management Council, in consultation with NOAA's National Marine Fisheries Service, proposes to adopt and implement Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This Final EIS presents the proposed action selected by the Council in Amendment 5, which relates to the goals and objectives outlined in the document. Amendment 5 was developed through a public process consistent with the National Environmental Policy Act (NEPA). The proposed action focuses on establishing a comprehensive catch monitoring program for the limited access herring fishery, addressing river herring bycatch in the herring fishery, 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. This FEIS document also includes a detailed description of the affected environment and valued ecosystem components (VECs), and analyses of the impacts of the proposed action on the VECs, as well as a cumulative effects analysis. It addresses the requirements of the MSA, NEPA, the Regulatory Flexibility Act (RFA), and other applicable laws and Executive Orders. Several alternatives to the proposed action and other management approaches were considered by the Council during the development of Amendment 5; the non-preferred alternatives are described and analyzed in this document as well, relative to the proposed action and relative to taking no action. Alternatives considered but rejected by the Council are also discussed.

Intentionally Blank

Executive Summary

This final amendment document and final environmental impact statement (FEIS) presents and evaluates management alternatives and measures to achieve specific goals and objectives for the Atlantic herring fishery. This document was prepared by the New England Fishery Management Council and its Herring Plan Development Team (PDT), in consultation with the National Marine Fisheries Service (NMFS, NOAA Fisheries), the Atlantic States Marine Fisheries Commission (ASMFC), and the Mid-Atlantic Fishery Management Council (MAFMC). This amendment is being developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, MSA) and the National Environmental Policy Act (NEPA), the former being the primary domestic legislation governing fisheries management in the U.S. Exclusive Economic Zone (EEZ). In 1996, Congress passed the Sustainable Fisheries Act (SFA), which amended and reauthorized the MSA and included a new emphasis on precautionary fisheries management. New provisions mandated by the SFA require managers to end overfishing and rebuild overfished fisheries within specified time frames, minimize bycatch and bycatch mortality to the extent practicable, and identify and protect essential fish habitat (EFH). The MSA was again reauthorized in 2007 to require the establishment of annual catch limits (ACLs) and accountability measures (AMs) in order to end and/or prevent overfishing in all FMPs. The proposed amendment is also consistent with the provisions contained in the reauthorized Magnuson-Stevens Act (January 2007).

This document represents Volume I and includes the Final Amendment as well as its final Environmental Impact Statement (FEIS) and a preliminary evaluation of impacts relative to the Regulatory Flexibility Act (RFA) and other applicable laws. Volume I provides the background and context for Amendment 5 (Affected Environment), describes in detail the proposed management action and all of the management alternatives considered by the Council in the amendment, provides updated information about all of the components of the ecosystem and fishery potentially affected by the measures proposed in Amendment 5, evaluates the potential impacts of the proposed action and other alternatives, addresses the Amendment 5 measures with respect to other applicable laws, and provides the public and the Council with adequate information about the measures and their impacts, which informed decision-making following the public comment period on the Draft EIS. Volume II includes all of the appendices referenced throughout this Draft Amendment document and FEIS.

The primary purpose of this amendment is to modify the management program for the Atlantic herring fishery by:

- Changing the reporting system and fishery management program to improve the collection of real-time, accurate catch information;
- Enhancing monitoring and sampling of herring catch at-sea; and
- Addressing bycatch issues through responsible management.

The MSA defines "bycatch" as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidental catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. Due to the high-volume nature of the Atlantic herring fishery, certain species, including river herring, shad, and some groundfish, may be either discarded or retained and/or sold when harvested during the Atlantic herring fishery. Therefore, for the purpose of this document, the terms "bycatch" and "incidental catch" are sometimes used interchangeably, and measures to "minimize bycatch to the extent practicable" refers to catch of species that may be both bycatch and incidental catch.

The data provided in this document indicate that the majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch (discards). However, as noted, some non-targeted catch that is landed incidentally is not separated and identified as such; this is particularly true with species like river herring and shad, other alosine pelagic fish that look very similar to Atlantic herring. The Council recognizes the need to minimize all catch of river herring in the Atlantic herring fishery, bycatch and incidental, and the management measures proposed in this document are intended to do so. Addressing river herring bycatch in the herring fishery includes both minimizing bycatch at-sea to the extent practicable, consistent with the MSA definition of bycatch, and minimizing the landing of river herring as incidental catch in the herring fishery. Measures to address catch monitoring at-sea (Section 3.2) are focused on minimizing bycatch to the extent practicable by increasing observer coverage and addressing net slippage. Measures to address river herring bycatch (Section 3.3) focus on both at-sea bycatch reduction (through monitoring and avoidance) and minimization of river herring incidental catch through portside sampling (as part of the SMAST/SFC program) and measures to adjust the herring fishery management program (Section 3.1).

The purposes and needs for this amendment are expected to advance the goals and objectives of the herring management program, as modified in Section 2.1.2 of this document. The proposed management action is intended to achieve both the goals and objectives of the management program, the specific goals and objectives of the catch monitoring program (identified in Section 2.1.3), in addition to the primary purposes of this action. The management alternatives considered by the Council in Amendment 5 generally included:

- Adjustments to the Atlantic herring fishery management program (permitting provisions, dealer and vessel reporting requirements, measures to address carrier vessels and transfers of Atlantic herring at sea, and requirements for vessel monitoring systems (VMS) and trip notifications);
- Measures to address/prioritize the allocation of NMFS-approved observers for at-sea sampling on limited access herring vessels;
- Provisions to enhance NMFS-approved observers' ability to maximize sampling at-sea;
- Measures to address/minimize net slippage by limited access herring vessels;
- Monitoring, avoidance, and protection alternatives to address river herring bycatch; and
- Criteria for midwater trawl vessel access to the year-round groundfish closed areas.

The Proposed Management Action in Amendment 5 consists of a series of ***Preferred Alternatives*** selected by the Council from a range of alternatives/options in each of the general categories identified above. The Council is proposing the following ***Preferred Alternatives*** in Amendment 5:

- Regulatory definitions for transfer at-sea and offload (Option B, Section 3.1.1)
- A series of administrative/general provisions to enhance the fishery management program (Option B, Section 3.1.2)
- Dual option for enrollment for herring carriers (Option 3, Section 3.1.3.2)
- No action to address transfers at-sea (Option 1, Section 3.1.3.3)
- Modifications to the pre-trip and pre-landing notification requirements for limited access herring vessels (Options 2 and 3, Section 3.1.4)
- Reporting requirements for federally-permitted dealers, including a requirement that dealers must accurately weigh all fish (Option 2B, Section 3.1.5)

- A new open access permit with a 20,000 pound herring possession limit for limited access mackerel vessels fishing in Areas 2/3 (Option 2, Section 3.1.6)
- Requirement for 100% observer coverage on Category A and B herring vessels, to be funded through a combination of Federal and industry funds, with the industry-funded component implemented one year after Amendment 5, with a maximum target industry contribution of $325 per sea day; waivers will not be issued in river herring monitoring/avoidance areas, and coverage levels will be reviewed by the Council after two years (Alternative 2, Section 3.2.1)
- Management measures to improve/maximize sampling at-sea (Option 2, Section 3.2.2)
- No action for a maximized retention experimental fishery in Amendment 5 (Alternative 1, Section 3.2.4)
- Management measures to address net slippage, including full sampling requirements and trip termination thresholds (10 events) by gear type and management area (Option 4C, Section 3.2.3)
- Establishment of River Herring Monitoring/Avoidance Areas and a two-phase bycatch avoidance program developed in cooperation with the fishing industry (Alternative 2, Option 4, Section 3.3)
- Mechanism to establish a river herring catch cap through either framework adjustment or specifications package, following the completion of a stock assessment by ASMFC (Section 3.3.5)
- Provisions to require Closed Area I sampling rules and 100% observer coverage on all midwater trawl vessels fishing in the groundfish year-round closed areas (Alternative 4, Section 3.4); and
- Additional measures that can be implemented in the future through a framework adjustment or the fishery specifications process (Section 3.5).

The Affected Environment is described in this document based on valued ecosystem components (VECs) that are identified specifically for Amendment 5. The VECs for consideration in Amendment 5 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 of an EIS since they are the "place" where the impacts of management actions are exhibited. The sections of the Affected Environment are therefore divided into the five VECs.

The impacts of the proposed management action and other alternatives considered in Amendment 5 on each of the VECs are generally summarized below. Much of the detailed analyses to support the development of the alternatives/options under consideration in Amendment 5 were provided by the Herring PDT and 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 to the Amendment 5 document (Volume II). The no action alternative represents status quo conditions for the Atlantic herring fishery management program and forms the basis for comparison and assessment of all management options/alternatives under consideration.

Atlantic Herring: The Atlantic herring fishery is managed through an overall annual catch limit (ACL, reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs for management areas that are designed to prevent overfishing on individual stock components. The ACLs and sub-ACLs are set through a specifications process every three years, based on the best available scientific information. The Atlantic herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of no action relative to most of the alternatives/options in

Amendment 5 would not be expected to directly impact the herring resource. This is because the measures are not likely to affect the amount of herring available for harvest and/or total removals. However, some of the indirect long-term benefits likely to result from the alternatives/options under consideration in Amendment 5 (discussed below) would not be realized if no action is taken.

The long-term benefits to the Atlantic herring resource from the proposed management action and other alternatives considered in Amendment 5 are somewhat indirect but stem from improved catch monitoring and data documenting removals from the herring fishery. The measures to improve catch monitoring, address river herring bycatch, and/or establish criteria for midwater trawl vessel access to groundfish closed areas should reduce the likelihood for errors in reporting, and consequently, in the calculation of catch statistics. Relative to taking no action, by implementing some of the alternatives/options proposed in Amendment 5, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term. This will lead to more effective long-term management of the herring resource.

The proposed action in Amendment 5 is summarized above. Overall, the measures proposed in Amendment 5 are likely to have a low positive impact on the herring resource. Many of the ***Preferred Alternatives*** proposed to adjust the fishery management program (regulatory definitions, administrative/general provisions, modifications to provisions for carrier vessels, increased trip notification requirements, and changes to open access provisions for limited access mackerel vessels, see Section 3.1) are administrative in nature; they are unlikely to affect the amount of herring available for harvest, fishing effort, or fishing behavior. The impacts of these options are likely to yield no direct impacts to the Atlantic herring resource. There may, however, be some indirect positive impacts on the herring resource from implementing the proposed changes. The proposed regulatory definitions and administrative/general provisions may reduce the likelihood for errors reporting, and consequently, in the calculation of catch statistics. If catch statistics improve by implementing the proposed adjustments, then management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty. This will lead to more effective long-term management of the resource and therefore result in minor indirect benefits.

The measures most likely to affect the herring resource are the alternatives to allocate observer coverage on limited access herring vessels and the management measures to address net slippage. The alternatives proposed to allocate observer coverage on limited access herring vessels (***Preferred Alternative*** 100% coverage on A/B vessels, Section 3.2.1.2) are intended to improve sampling in the limited access herring fishery and increase precision associated with catch/bycatch estimates of Atlantic herring. Measures to address net slippage (***Preferred Alternative*** full sampling plus trip termination after ten events, Section 3.2.3.4) are intended to provide observers with a better ability to fully sample the catch on herring vessels. To the extent that the proposed measures can improve the observers' access to all of the fish in the net, the observers' ability to identify species composition of bycatch (discarded) may improve. These measures have potential to increase the likelihood of better documenting herring catch (total removals). As catch information improves, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The quantification of previously unaccounted mortality could improve the data used in assessments, thereby decreasing scientific uncertainty, albeit to an unknown degree. In addition, reducing the likelihood for errors in the calculation of catch statistics through increased sampling could reduce management uncertainty (uncertainty about catch estimates is a component of management uncertainty), again enhancing long-term management of the herring fishery.

The ***Preferred Alternative*** to address river herring bycatch (Section 3.3.2) proposes to establish River Herring Monitoring/Avoidance Areas and includes options for implementing additional catch monitoring provisions in those areas. There are indirect long-term benefits to the Atlantic herring resource that would likely result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch (i.e., fish not brought on board), which the measures proposed under ***Preferred Alternative*** are intended to do, primarily to address river herring concerns. The impacts of the proposed long-term river herring bycatch avoidance strategy (two-phase strategy based on the SMAST/SFC project, see Section 3.3.2.2.4) on the Atlantic herring resource are likely to be positive to the extent that they enhance catch monitoring and data collection in the River Herring Monitoring/Avoidance Areas. There may be additional long-term benefits on the herring resource from Option 4, however, if the industry can work cooperatively to develop a long-term avoidance strategy. The communication network and cooperative relationships developed under Option 4 may lead to enhanced catch/bycatch management of all species in the fishery and could ultimately improve herring catch monitoring.

The ***Preferred Alternative*** for establishing criteria for midwater trawl vessel access to the year-round groundfish closed areas would implement the Closed Area I sampling provisions on midwater trawl vessels fishing in all of the year-round groundfish closed areas (Section 3.4.3). While there is not likely to be any direct impact on the herring resource from increasing observer coverage on midwater trawl vessels in the groundfish closed areas, the indirect benefits to the herring resource of increased monitoring/sampling are addressed throughout the analyses in this document and apply to the ***Preferred Alternative*** in the groundfish closed areas. As catch information in the fishery continues to improve, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels.

Non-Target Species and Other Fisheries: *Non-target species* refers to species other than herring which are landed by federally permitted vessels while fishing for herring. These non-target species may be caught by the same gear while fishing for herring, and may be sold assuming the vessel has proper authorization or permit(s). For the purposes of Amendment 5, 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 (multispecies) groundfish fishery. In the Atlantic herring fishery, river herring (alewife, blueback herring) are caught incidentally during certain times and in certain areas. Due to the overlap of the species, measures proposed in Amendment 5 to address river herring bycatch are likely to have similar impacts on shad (American shad and hickory shad). Atlantic mackerel is a primary alternate species caught by herring vessels and is commonly landed. The Northeast multispecies (groundfish) fishery is a primary alternate fishery for some herring vessels, and the areas of operation of both fisheries overlap. The potential impacts of the proposed management action and other alternatives considered in Amendment 5 are evaluated with respect to non-target species and other fisheries throughout this document.

While many of the measures under consideration in Amendment 5 relate to improving catch reporting in the directed herring fishery, positive impacts (indirect) are expected for non-target species and other fisheries from the measures that have been selected. The catch monitoring measures that are likely to have the most positive impact on non-target species and other fisheries are the alternatives that allocate observer coverage on limited access herring vessels and the measures under consideration to address net slippage. The alternatives proposed to allocate observer coverage on limited access herring vessels (***Preferred Alternative*** 100% coverage on A/B vessels) are intended to improve sampling in the limited access herring fishery and increase precision associated with catch/bycatch estimates of non-target species and other fisheries. There may be indirect long-term benefits that would likely result from improvements to catch sampling, increased sampling, a reduction in unobserved catch, and an increase in the accuracy of

bycatch estimates that result from observer sampling. These benefits are discussed throughout this document and relate to improving catch data for stock assessments and enhancing long-term management. Measures to address net slippage (***Preferred Alternative*** full sampling plus trip termination after ten events) are intended to provide observers with a better ability to fully sample the catch on herring vessels. To the extent that the proposed measures can improve the observers' access to all of the fish in the net, the observers' ability to identify species composition of operational discards and other discarded fish may improve. This may improve estimates of bycatch/discards of non-targeted species in the herring fishery and ultimately lead to a more reliable discard estimate that can be factored into stock assessments and utilized for better managing non-target species.

The management measures to address river herring bycatch (***Preferred Alternative*** Monitoring/Avoidance with Two-Phase Avoidance Program) were developed by the Council in response to concerns about the impacts of bycatch of this important species in the directed herring fishery. 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. From this information, the status of 23 stocks were determine 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 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. The ASMFC-managed directed river herring fishery is under a coastwide landings moratorium effective January 1, 2012. States with approved sustainable harvest plans have exemptions from the moratorium. These States include Maine, New Hampshire, New York, North Carolina, and South Carolina. NOAA considers both species, alewife and blueback herring, as species of concern and is reviewing whether they should be listed under the Endangered Species Act. The selection of the no action alternative with respect to river herring measures would therefore not likely be aligned with the coastwide moratorium and exemption process; however, the measures in place under the ASMFC and States would continue for both shad and river herring if the no action alternative was selected. It is likely, however, that the increased monitoring and data collection benefits or reductions in fishing effort in some times/areas that may be realized under the alternatives considered to address river herring bycatch may not be realized under the no action alternative. As previously noted, the catch monitoring measures in Amendment 5 are also expected to have positive impacts on river herring and other non-target species had the no action alternative been selected with respect to additional measures to address river herring bycatch. The additional measures that were selected (river herring monitoring/avoidance, SMAST avoidance program, mechanism to establish catch caps) are expected to have additional positive impacts on non-target species and other fisheries, particularly river herring and shad.

The alternatives to establish criteria for midwater trawl vessel access to the year-round closed areas (***Preferred Alternative*** 100% observer coverage and Closed Area I Sampling Provisions) may have a low positive impact on non-target species and other fisheries. The potential for positive impacts is greatest for the groundfish species, as these areas were selected by the Council to reduce groundfish mortality and rebuild groundfish stocks. Catch information presented in this document indicates that the majority of groundfish bycatch by midwater trawl vessels is haddock, the catch of which on midwater trawl vessels is already managed through a catch cap. The groundfish year-round closed areas were selected and closed to groundfish fishing to reduce fishing mortality and offer protection to groundfish stocks and spawning grounds. The closed areas may provide mortality reductions for some non-target species, especially groundfish. This benefit, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. The ***Preferred Alternative*** that requires 100% observer coverage and Closed Area I sampling provisions in all of the year-round groundfish closed areas is expected to produce positive impacts for non-target species and other fisheries

by enhancing data collection and improving the estimation of species-specific bycatch on midwater trawl vessels.

Physical Environment and Essential Fish Habitat: Most of the alternatives/options that were considered in this amendment are not expected to affect the amount or location of herring fishing effort where impacts can be predicted, and therefore most of the proposed measures are not likely have any adverse effects on EFH. For instance, the measures under consideration for adjustments to the fishery management plan are generally administrative in nature, and therefore not likely to have an effect on EFH. The two options under consideration that would implement changes to the open access provisions for limited access mackerel vessels may result in some impact to EFH by increasing potential for effort in the areas beyond recent or current levels, however the magnitude of the increase in trips that would be taken would not likely be large and would not change the areas in which operation typically occurs, and therefore any increase in bottom contact resulting from this alternative would have no more than a minimal adverse impact on benthic EFH, so the impacts to EFH is expected to be slight.

The measures proposed for catch monitoring at sea are also expected to have a neutral impact overall, as effort in the herring fishery is not expected to increase or decrease as a result, and therefore adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would likely continue to be minimal and temporary if these measures are selected. The impacts of the measures to address river herring bycatch on essential fish habitat are expected to enhance monitoring requirements or close areas; enhanced monitoring requirements are not expected to result in any additional impacts to seabed habitats/EFH, and while predetermined seasonal closures could influence spatial patterns of fishing effort, the changes are difficult to predict. Because seabed contact by midwater trawl gear is rare, it is assumed that herring fishery adverse effects on EFH will continue to be minimal and temporary if monitoring and avoidance areas are implemented. Under Alternative 3 (River Herring Protection), however, a shift in fishing that results in increased effort on Georges Bank during herring spawning (September – November) might lead to an increase in seabed gear contact, and thus an increase in adverse effects to EFH. The management measures to address midwater trawl access would either increase observer coverage in some areas or close areas to midwater trawl vessels; since midwater trawl gear has been determined to only occasionally contact the bottom and its impact on benthic habitats has been determined to be minimal and temporary, the increase in observer coverage would not cause any additional impacts to EFH. Potential changes in the magnitude and location of fishing effort as a result of the closures, and thus potential changes in seabed contact rates, are difficult to predict, however.

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. Due to this ongoing management of protected resources in the areas in which the herring fishery operates, the selection of no action relative to most of the alternatives/options in Amendment 5 would not be expected to directly impact them. Not selecting the other alternatives/options, however, may result in a small lost opportunity. Overall, most of the impacts of the proposed management action and other measures considered in Amendment 5 on protected resources are likely to be neutral or present a low positive impact, as the measures will not be changing operations within the fishery in a way that would negatively or positively impact them, but may increase observer coverage or close areas, thereby benefitting the species by collecting more information that will improve management in the future or removing them from the possibility of being impacted by Atlantic herring fishery operations.

From the standpoint of protection and monitoring of protected resources in the area, most of the measures under consideration for adjustments to the fishery management plan are administrative in nature, and therefore not likely to have an effect. The two options under consideration that would implement changes to the open access provisions for limited access mackerel vessels may result in some impact to protected resources by increasing potential for effort in the areas beyond recent or current levels; however, the magnitude of the increase in trips that would be taken would not likely be large and would not change the areas in which operation typically occurs, so the impacts to protected resources is expected to be slight. The measures proposed for catch monitoring at sea are also expected to have a neutral impact overall, as effort in the fishery is not expected to increase or decrease as a result, although a few measures that would potentially capture more rare events or record information from slipped catch have the potential to present a low positive impact on protected resources. The impacts of the measures to address river herring bycatch on protected resources are harder to predict, as the shift in effort as a result of the measures may or may not concentrate effort where the species overlap; however, most of the impacts are expected to be neutral or have a low positive effect, if observer effort is increased. Finally, the management measures to address midwater trawl access generally have the potential to have a low positive impact on protected resources through the collection of more information during encounters with the herring fishery and in areas which would potentially close as a result of the measure. Some shift in effort may occur as a result of the closures, however, so some impacts are currently unknown or are expected to be neutral as a result.

Fishery-Related Businesses and Communities: The 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 during the winter (January-April), and oftentimes as part of the directed mackerel fishery. There is significant overlap between the herring and mackerel fisheries during the winter months, although catches on Georges Bank (Area 3) tend to be relatively low. The herring summer fishery (May-August) is generally prosecuted throughout the Gulf of Maine and Georges Bank as fish are available. Restrictions in Area 1A (including ASMFC days out measures implemented in response to quota reductions) have pushed the fishery in the inshore Gulf of Maine to later months (late summer). Fall fishing (September-December) tends to be more variable and dependent on fish availability. A complete description of the Atlantic herring fishery, including vessels, dealers, processors, and fishing communities, is provided in the this document.

In general, the catch monitoring program proposed in Amendment 5 is intended to improve reporting and documentation of catch – landings and discards – in the Atlantic herring fishery. The long-term impacts of improving catch monitoring is positive for fishery-related businesses and communities. As reporting and compliance improves, management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty) and long-term management of the herring fishery may improve. For example, some of the measures under consideration could reduce the likelihood for misallocating or double counting herring catches. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term. To the extent that scientific and management uncertainty can be reduced, additional yield can be made available to the herring fishery. The long-term impacts of reducing scientific and management uncertainty are likely to be positive. Some of the fishery-related impacts expected from the alternatives/options under consideration in the Amendment 5 catch monitoring program are summarized in the following bullets; the FEIS presented in this document, as well as the documents in Volume II, should be referenced for more thorough analysis and discussion of impacts.

- The impacts of the proposed measures to address carrier vessels (Section 3.1.3.2) are expected to be positive for vessels engaged in this activity. For those vessels that already have VMS units on board, there would likely be no cost increase to using that unit to declare into the herring fishery as a carrier vessel.

- The measures to address transfers-at-sea (Section 3.1.3.3) may reduce opportunities for some vessels to participate in the herring fishery by limiting their ability to transfer herring at sea (unless they are carrying herring or participating in a pair trawl operation). Because of the high cost of fuel, the requirement to return to port in order to land their catch could negatively impact herring-related businesses that have permits that would fall under a transfer restriction. The impacts of these options on fishery-related businesses and communities, therefore, may be low negative. This is one reason why the Council selected the no action alternative, as discussed in the rationale for the ***Preferred Alternative***.
- Extending the pre-trip and pre-landing notification requirements (Section 3.1.4) may improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery. Thus, data collected via the observer program may be more likely to achieve management goals (e.g., CV targets on discard estimates). Subsequently, management uncertainty may be reduced (uncertainty about discard estimates is a component of management uncertainty) and long-term management of the herring fishery may improve. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term. To the extent that management uncertainty can be reduced, additional yield can be made available to the fishery. The long-term impacts of reducing management uncertainty are positive for fishery-related businesses and communities.
- Overall, the impacts of the options to change open access permit provisions for limited access mackerel vessels (Section 3.1.6) are expected to be positive in comparison to the no action option, because of increased fishing opportunities and potential reductions in regulatory discards of herring.
- The impacts of measures to improve/maximize sampling at-sea (Section 3.2.2) are not expected to be significant for fishery-related businesses and communities. There may be some operational adjustments required by vessel operators and crew to comply with the new provisions; however, the proposed measures codify many of the practices that are already occurring at-sea when vessels take observers on-board. Interviews with captains and representatives/owners of herring businesses suggest that the proposed steps for improving or maximizing sampling at sea are currently a part of every herring vessels' normal operating practices, agreed upon by the fleet. To the extent that there are any vessels who do not comply, this option will make it easier to mandate these steps, thus making certain that observers on every boat have equal opportunity to fully sample the catch. The measures should improve the vessel owner/operator's understanding regarding expectations and the collection of information by observers during a fishing trip, and ensure safe working conditions for observers on all fishing vessels. For the most part, there should be no differential impacts (by permit category) associated with these options. The direct pecuniary economic impacts of this option on the participants in limited access herring fishery are expected to be minimal. Any economic impacts to the herring fishery will be through increased administrative and regulatory burden.
- Some of the options that were considered by the Council to address net slippage (Section 3.2.3) may have negative impacts on fishery-related businesses and communities. Any economic impacts to the herring fishery will be through increased time spent pumping fish aboard the vessel to be sampled and inspected by a NMFS-approved observer. The pecuniary impacts on the participants in herring fishery are therefore expected to be potentially low negative when compared to taking no action. In general, the option/sub-options proposing a catch deduction/trip termination for slippage events are designed to create a disincentive for limited access herring vessels to slip catch. When choosing to slip a net or bring all fish onboard, vessel operators will compare the costs of bringing those fish aboard to the penalty associated with slippage. The costs of bringing fish aboard which would otherwise be slipped are the extra time spent in this activity and, possibly, decreases in vessel safety during poor operating conditions. The extent of impacts would depend on to what extent safety is affected (e.g., injury to loss of life for crewmembers and damage to loss of vessel for the boat) and the result. These costs are the same under all of the options/sub-options under consideration. The

overall impact of the options that propose catch deductions and trip termination, in comparison to no action, is therefore expected to be negative. The Council selected a ***Preferred Alternative*** that does not include a catch deduction provision for many of these reasons (see Section 3.2.3 for more discussion of the Council's rationale).

The Council's ***Preferred Alternative*** proposes ten-trip slippage thresholds by gear type and management area for trip termination provisions. Information collected by observers about slipped catch in 2011 suggests that the proposed trip termination thresholds (by gear type and management area) may particularly impact the purse seine fleet in Area 1A and the midwater trawl fleet fishing in all areas. See Section 6.3.2.2.6 of this document for a more thorough discussion of these potential impacts.

During final decision-making, the long-term positive impacts of improving catch monitoring were weighed by the Council against the negative impacts of implementing the catch monitoring program (and other measures proposed in Amendment 5) on fishery-related businesses and communities. Some of the measures proposed in Amendment 5 are likely to impose a cost on the industry, and the impacts on fishery-related businesses and communities are therefore likely to be negative. The alternatives/options that are most likely to result in negative impacts on fishery-related businesses and communities are the alternatives to allocate observer coverage on limited access herring vessels, measures to address river herring bycatch, and management measures to establish criteria for midwater trawl vessel access to the year-round groundfish closed areas.

Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels (Section 3.2.1)

The impacts of the funding options are discussed in the Draft Amendment 5 document and apply to any alternatives under consideration that would require additional funding. Under Funding Option 1 (proposed for Year 1 only), Alternatives 2-4 are expected to have a neutral effect on fishery-related businesses and communities with respect to the no action alternative. Under Funding Option 2, Alternative 2 is likely to have the largest negative impacts on fishery-related businesses and communities. Alternative 4 is likely to have negative impacts, although the size of these impacts depends on the Council-specified targets/priorities. Alternative 3 is likely to have neutral or low negative impacts on fishery-related business and communities. Options for Observer Service Providers are likely to have neutral impacts on fishery-related businesses.

Alternative 2 (***Preferred Alternative***) requires 100% observer coverage on Category A and B herring vessels and would create negative impacts on herring-related businesses or communities if Federal funds were not used to pay for the additional observer coverage. Under Funding Option 1 (no action), the presumption is that Federal funds would be used for Year 1. Under Funding Option 2, industry funds would be required to cover costs when Federal funds are unavailable; therefore, negative impacts on fishery participants are likely. These increased economic costs would result in less effort, lower landings, and affect the supply of herring bait in other fisheries. It would also negatively affect the businesses that supply (directed) herring-related businesses, and the communities whose economies are partially reliant on them (see the profiles for the Amendment 5 communities of interest, provided in this document).

Relative to the daily operating costs for the fishery, the cost of an observer for limited access herring vessels is fairly high. For example, at full cost (estimated around $1,200/day), a NEFOP observer would increase the per-day costs of Category A and B single midwater trawl, pair trawl, purse seine and bottom trawl by 28%, 36%, 67%, and 153% respectively (see Table 141 in Section 6.2.6). If the industry contribution is limited to $325 per sea day, the impact on revenues and operating costs is greatly reduced (8%, 11%, 19%, and 45% for midwater trawl, pair trawl, purse seine, and bottom trawl, respectively). The impacts of the industry-funded element of the monitoring program will be more thoroughly evaluated

in the action that implements the details of the program (one year following the implementation of Amendment 5).

Similarly, relative to daily revenues, the cost of an observer is lower; the full cost of an observer would represent about 9%, 8%, 6%, and 22% of average daily revenues for the Category A and B midwater, pair trawl, purse seine, and bottom trawl vessels respectively and significantly less if the industry contribution is $325 per sea day (Table 141). These figures are presented for illustration; it is possible that the type of data required in this fishery could result in higher or lower per-day costs than the $1,200 amount used. The costs of observers and the impacts of the industry-funded element will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5).

Measures to Address River Herring Bycatch (Section 3.3)

Relative to the no action alternative, Alternative 2 (River Herring Monitoring/Avoidance, Section 3.3.2) and Alternative 3 (River Herring Protection, Section 3.3.3) are expected to have a negative impact on fishery-related businesses and communities due to the costs associated with increased monitoring and/or area closures.

Under Alternative 2 (***Preferred Alternative***), the extent of the impacts will depend on the option selected for monitoring as well as the availability of Federal funding for observer coverage in the proposed River Herring Monitoring/Avoidance Areas. Option 1, requiring 100% observer coverage in the Monitoring/Avoidance Areas, would likely have the largest negative impact on fishery-related businesses and communities, especially if the industry is required to pay for some or all observer coverage. Option 2 would have a similar negative impact as Option 1 if the sub-option for 100% observer coverage is selected. Option 3 implements either Options 1 or 2 after a catch trigger is reached and would therefore have less impact on fishery-related businesses and communities because the additional monitoring requirements would not become effective until the catch trigger is reached; if the catch trigger is not reached in any area during the fishing year, then no additional monitoring requirements would be applied to the Monitoring/Avoidance Areas. Option 4 represents an approach that builds from some industry-based initiatives and has potential to minimize adverse effects on fishery-related businesses and communities. Option 4 was selected as the ***Preferred Alternative*** and has the potential to mitigate some of the negative impacts of this alternative by phasing-in a bycatch avoidance approach that is developed in cooperation with the fishing industry.

Under Alternative 3, some/all vessels having a Category A, B, C, or D permit would have been prohibited from fishing for, possessing, catching, transferring, or landing herring from the proposed River Herring Protection Areas on all fishing trips using small mesh. The economic impact of this alternative on fishing vessels is the change in profits of these vessels, after accounting for any behavioral changes. Under a spatial closure, the directed herring fleet may undertake different averting behavior to minimize the impact of those spatial closures. Vessels may fish in other areas, likely with lower profits. Vessels may fish in other fisheries, again, likely earning lower profits, or cease fishing operations, in which case they earn zero operating profits. The exact impacts cannot be quantified at this time. However, based on current patterns of use, the impacts are expected to be neutral for vessels that use purse seine gear. The impacts are expected to be negative for vessels that use trawl gear to harvest herring.

Measures to Establish Criteria for Midwater Trawl Access to Groundfish Closed Areas (Section 3.4)

Alternatives 1 and 2 are not likely to result in significant impacts on fishery-related businesses and communities. Alternative 1 would maintain the measures in place that currently govern the Atlantic herring fishery and the associated fishery-related businesses and communities. Alternative 2 would eliminate the Closed Area I sampling provisions and the requirement that vessels take an observer on any trip that may enter Closed Area I. This alternative would likely have positive impacts on fishery-related businesses and communities because it increases flexibility and fishing opportunities while decreasing the regulatory burden associated with fishing in Closed Area I.

Under Alternative 3, 100% observer coverage would be required on midwater trawl vessels fishing in the groundfish closed areas. Using $1,200 per NEFOP-day as the cost of a day of monitoring, the total costs of this observer coverage is estimated at $254,400. However, based on observer days allocated through the current SBRM process, the midwater trawl fleet is likely to receive about 30% coverage. Therefore, the additional impacts to the fishing industry are likely to be approximately $169,000 if industry-funded observers are utilized to cover the additional cost in the groundfish closed areas (see Section 5.2 of the Draft Amendment 5 document for more information). If observer coverage is industry-funded, it is possible that herring vessels will avoid fishing in these areas more often (depending on markets, fish availability, fuel prices, and other factors) because fishing in the groundfish closed areas would be more expensive.

The expected impacts of Alternative 4(A) – the ***Preferred Alternative*** – are similar to the expected impacts of Alternative 3 because this option requires 100% observer coverage in all of the groundfish closed areas. Restrictions on fishing practices as a result of the additional requirements are likely to increase costs of fishing slightly. The other potential impact is diminishing flexibility since the vessel operator would be required to provide notice if fishing in any of the year-round closed areas was contemplated. The requirement that a vessel must leave a Closed Area acts as a disincentive to slip a nets; however, this requirement may not promote safety-at-sea.

Alternative 5 proposes to close the year-round groundfish closed areas to midwater trawl vessels participating in the herring fishery. This alternative would reduce revenues for the midwater trawl fishery, and the number of midwater trawl trips would likely also decrease. While 12% of revenues for the midwater trawl fishery were located in the five closed areas (see analysis in Draft Amendment 5 document), this effort and revenue is not likely to completely disappear. Instead, the midwater fleet is likely to fish in other, less productive areas. This will increase costs for the fleet. The purse seine fleet is likely to benefit from additional catch due to the exclusion of trawl gear from the Western Gulf of Maine Closed Area portion of Area 1A.

The following tables summarize the impacts of the management alternatives/options that were considered in Amendment 5, as well as the ***Preferred Alternative,*** on each of the VECs identified in this amendment and described in the Affected Environment. Some additional discussion regarding the cumulative impacts of the proposed alternatives on fishery-related businesses and communities is also provided following the tables, with more specific focus on social impacts. This table has been updated from the Amendment 5 Draft EIS based on new/updated information provided in this document, and also to include more specific characterization of the Council's ***Preferred Alternatives***.

	Potential Impacts of the Proposed Adjustments to the Fishery Management Plan (Section 3.1)			
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.1.1, Regulatory Definitions: Proposed regulatory definitions for *offload* and *transfer at sea*	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled
Section 3.1.2, Administrative/General Provisions: -Expand possession limits to vessels working cooperatively -Eliminate the VMS power down provision - At-sea Dealer Permit	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled
Section 3.1.3, Carrier Vessels: Option 2 - allow carriers to declare in/out through VMS to eliminate the 7-day minimum enrollment Option 3 - dual option allows SQ for carriers with no VMS	Neutral Measures not likely to affect the amount of herring for harvest or fishing effort	Neutral Measures not likely to affect non-target species encountered in the herring fishery	Neutral Measures not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Negative/Low Positive Option 2 would increase flexibility for limited access vessel but may negatively impact open access vessels that would need to purchase ($1,750-$3,300) and operate ($40-$100/month) a VMS; Option 3 increases flexibility for all vessels without the additional cost of purchasing/ operating a VMS
Section 3.1.3.3, Transfers at Sea: Option 2 - Category A and B vessels only Option 3 - prohibit transfers to non-permitted vessels ****The Council selected Option 1 (No Action) – expected to have neutral impacts across all VECs (see discussion)***	Low Positive Measures not likely to affect the amount of herring for harvest or fishing effort; transfers at sea represent small component of fishery, but options under consideration may improve catch monitoring	Neutral Measures not likely to affect non-target species encountered in the herring fishery	Neutral Measures not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Negative Option 2 decreases flexibility of Category C and D vessels; Option 3 decreases flexibility for all herring vessels by prohibiting vessels from selling herring at sea as lobster bait; Options 2 and 3 increase reporting burden but should have minimal negative economic impacts as less than 0.5% of catch is transferred at sea

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Proposed Adjustments to the Fishery Management Plan (Section 3.1) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Business and Communities
Section 3.1.4: Trip Notification Requirements Option 2 - modify/extend pre-trip notification requirements and add VMS gear declaration Option 3 - extend pre-landing notification requirement	Low Positive Herring harvest or fishing effort is not expected to change, but catch accounting and/or the tracking of catch may improve; either may improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Options 2 and 3 will increase reporting burden, but measures should provide consistency regarding which vessels are subject to the pre-trip and pre-landing notifications and extending notification requirements will likely improve allocation of observer coverage and management uncertainty can therefore be reduced.
Section 3.1.5: Reporting Requirements for Federally Permitted Dealers Option 2 - require dealers to weigh all fish Sub-Option 2A and 2B– requirement for annual/weekly reporting of catch composition estimation method Sub-Option 2C – vessel owner/operator confirmation of SAFIS	Neutral/Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; sub-options may provide more information	Neutral/Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; sub-options may provide more information	Neutral Measures are not likely to affect EFH or Protected Resources; Sub-Options is not likely to improve separation of protected resources	Neutral Sub-Option 2A/2B Low Negative Sub-Option 2C Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; Sub-Options 2A/2B would require extra time and effort for owner/operators; 2C may improve quality of data, resulting in better monitoring against sub-ACLs (potential economic benefit)
Section 3.1.6: Changes to Open Access Provisions for Limited Access Mackerel Vessels in Areas 2/3 Option 2 - 20K pound possession limit of LA mackerel vessels with OA herring permit Option 3 - 10K pound possession limit option for LA mackerel vessels with OA herring permit	Neutral Increases the potential for targeted fishing for herring in SNE and MA areas; should not be a concern for herring because of quota management (controls F) but impact on inshore stock depends on timing of catch and stock component mixing	Unknown Impacts will depend largely on how many vessels/which tiers the Council agrees to apply these options to; will also depend on if additional measures are implemented to monitor or manage the catch of non-target species in the times and areas where vessels with the new mackerel permit may fish	Neutral Increase in effort may lead to more encounters with EFH and/or Protected Resources, however the effort increase is expected to be minimal based on the magnitude of the overall fishery	Positive Could decrease the occurrence of regulatory discards and increase revenues for vessels that qualify for this permit category; vast majority of mackerel are landed by vessels which are not subject to the 3 mt possession limit; equity issue between LA herring and mackerel permit holders may be resolved by permitting similar levels of non-directed catch in both fisheries

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2) VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Business and Communities
Section 3.2.1.2, Alternative 2 - 100% Observer Coverage: Funding Option 2 - federal and industry funds States as Service Providers Option 2 - states authorized ****The Council selected this alternative for A/B vessels only, with industry funding starting in Year 2, target max $325/day; review coverage after 2 years***	Positive Benefits to resource would be highest under this alternative because it increases the likelihood of better documenting herring catch the most; may improve the precision of estimates of discards and/or landed bycatch; long-term effects may have low positive effects; relationship between observer coverage and precision important to consider at high levels of coverage	Positive Benefits from significant increase in sampling and coverage, which should lower CVs and increase precision of bycatch estimates in the herring fishery; relationship between observer coverage and precision important to consider at high levels of coverage	Neutral/Low Positive Measures are not likely to affect EFH; the effects to Protected Resources result from significant increase in sampling and observer coverage	Potentially High Negative Likely to create negative impacts on herring-related businesses or communities to the extent that Federal funds cannot pay for the additional observer coverage; full cost of 100% coverage of the A/B/C herring fishery is likely to be approximately $2.5M per year; costs of ***Preferred Alternative*** mitigated by limiting to A/B vessels only, phasing-in industry funding, and reviewing after two years
Section 3.2.1.3, Alternative 3 – Require SBRM Coverage Levels as Minimum: Funding Option 2 - federal and industry funds	Unknown/Potentially Low Positive Unclear how observer allocations may differ from the status quo; if sampling increases, may improve the precision of estimates of discards and/or landed bycatch; have low positive long-term effects	Unknown/Neutral Unclear how observer allocations may differ from the status quo; if sampling increases, will only affect a minor component of Northeast Region fisheries	Neutral/Unknown Measures are not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Unknown/Potentially Low Negative Similar to status quo; unclear what additional coverage would result from adopting this approach; would negatively affect fishery-related businesses if industry has to pay for additional coverage
Section 3.2.1.4, Alternative 4 - Council Specified Targets: Funding Option 2 - federal and industry funds	Low Positive May improve the precision of estimates of discards and/or landed bycatch; long-term effects may have low positive effects	Positive Allocation of additional observer coverage of river herring and haddock may lead to a great understanding and reliability of their bycatch estimates; would not impact the SBRM allocation scheme, and would therefore not cause other fisheries to be under-sampled	Neutral/Low Positive Measures are not likely to affect EFH; Protected Resources may benefit from additional monitoring	Potentially Negative Impacts depend on funding options for observer coverage; would negatively impact herring-related businesses if the industry has to pay for coverage; depends on the Council-specified targets/priorities

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Businesses and Communities
Section 3.2.2.2, Additional Measures Improve Sampling: Option 2A - requirements for a safe sampling station Option 2B - requirements for reasonable assistance Option 2C - requirements to provide notice Option 2D - requirements for trips with multiple vessels Option 2E - pair trawl communication Option 2F - visual access to net/codend	Neutral May have little impact on the Atlantic herring resource; several of the measures may provide some additional information on the contents of slipped nets, discards, and landed catch, but likely to be qualitative	Neutral Several of the measures may provide some additional information on the contents of slipped nets, discards, and landed catch, but likely to be qualitative and not likely to affect the outcome of future assessments of non-target species	Neutral Measures are not likely to affect EFH or Protected Resources	Neutral Minimal direct economic impacts on the herring fishery; the proposed steps for improving or maximizing sampling at sea are currently a part of every herring vessels' normal operating practices, according to interviewed captains; it is unknown how this measure may affect purse seine operations; any economic impacts to the herring fishery will be through increased administrative and regulatory burden, but expected to be slight
Section 3.2.3.2, Measures to Address Net Slippage: Option 2 - require released catch affidavit for slippage events	Unknown May improve accounting of Atlantic herring catch but still represents an estimate; may therefore be redundant and unlikely to affect herring resource	Neutral May improve accounting of non-target species/other fisheries catch, but still represents an estimate	Neutral Released catch affidavits are not likely to affect EFH or Protected Resources	Neutral Minimal impacts on the directed herring fishery
Section 3.2.3.3, Measures to Address Net Slippage: Option 3 - CAI Sampling Provisions	Positive Likely to improve accounting of Atlantic herring catch; may improve statistics used in stock assessment and reduce uncertainty to an unknown degree	Low Positive Likely to improve accounting of non-target species/other fisheries	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Minimal direct economic impacts on the herring fishery; however there may be new challenges associated with bringing operational discards on board for some vessels; increased times spent pumping fish to be sampled and observed; it is unknown how this measure may affect purse seine operations

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Businesses and Communities
Section 3.2.3.4, Measures to Address Net Slippage: Option 4 - catch deduction (and possible trip termination) for slippage events Option 4A -catch deduction, possible trip termination Option 4B - with CAI provisions Option 4C - with CAI provisions (10 events) Option 4D - with CAI provisions (5 events) ***The Council selected Option 4C, with trip termination thresholds (10) by gear type and management area***	Low Positive Would likely result in sub-ACLs being attained more quickly with subsequent directed fishery closures occurring sooner; possible increase in herring abundance	Neutral/Potentially Low Positive Effects difficult to predict; trip termination could reduce the amount of effective fishing effort in an area throughout the course of the fishing season, thereby reducing bycatch and mortality of non-target species; the extent of the impacts will be determined by how fishing effort shifts and whether or not the fleet moves into an area(s) with a higher potential of encountering these species.	Unknown Not likely to affect EFH; impacts to Protected Resources will vary based on reaction of the fleet to the new measures	Negative Trip termination increases costs to participants; sub-ACL deductions could reduce catch and revenue, although this is likely to have an effect only in Areas 1A and 1B unless sub-ACLs are fully utilized in other areas; aggregate revenues expected to decline by $12,000-$15,000 per slippage event in areas where ACLs are fully utilize -Potential safety concerns with trip termination and measures that are perceived as punitive ***Preferred Alternative*** likely to impact purse seine vessels in Area 1A and midwater trawl vessels fishing in all areas
Section 3.2.4.2, Alternative 2: Evaluation of maximized retention through the annual issuance of exempted fishing permits ***The Council selected Option 1 (No Action) – expected to have neutral impacts across all VECs and unknown impacts on fishery-related businesses and communities (see discussion)***	Unknown/Low Positive Would likely have little effect on the herring resource because it would not affect the mortality rate exerted on the stock; dealers may record previously undocumented catch	Unknown/Low Positive Could increase the scientific knowledge available to fisheries managers about bycatch of non-target species; impacts to mackerel fishery would need to be evaluated by NMFS when the alternative is developed	Neutral Exempted fishing permits are not likely to affect EFH or Protected Resources	Unknown Could degrade the quality of the catch by damaging in while in the fish hold; retention of non-marketable fish in the hold of a vessel reduces the amount of marketable fish which can be landed; magnitude of these effects are unknown at this time.

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Potential Impacts of the Management Measures to Address River Herring Bycatch (Section 3.3)				
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.3.2.2.1, 3.3.2.2.2, and 3.3.2.2.3; Alternative 2 - Monitoring/Avoidance Management Options: Option 1 - 100% Observer Coverage Option 2 - CAI sampling provisions Option 3 - trigger based monitoring	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Potentially Positive May improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring and could lead to possible reductions in river herring mortality if the fleet avoids those areas; more monitoring may mean more bycatch/discards information in specific areas where river herring may be missed; monitoring specific areas instead of across the full range of the species may miss important river herring encounters by the fleet	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Negative Potential for increased costs associated with industry payment for observers; could trigger additional losses, thereby affecting bait supplies; slightly higher regulatory/compliance costs; indirect users of the river herring resource may benefit if higher stock levels of river herring are achieved; uncertainty of trigger mechanisms makes business planning difficult; complexity of trigger reporting options likely to be very challenging for fishery participants to provide accurate catch information in a real-time manner; impact may be mitigated for shrimp fishery and large-mesh bottom trawl vessels if exemption is approved
Section 3.3.2.2.4, Alternative 2 - Monitoring/Avoidance Management Options: Option 4 - two phase bycatch avoidance approach based on SFC project	Neutral No direct biological impact on the herring resource; indirect long-term benefits if the industry can work cooperatively to develop a long-term avoidance strategy	Potentially Positive Could be reductions in river herring mortality in the bimonthly avoidance areas; would need to be adequate incentives in place for the fleet to avoid the areas	Neutral The shift in effort is not likely to affect EFH or Protected Resources	Low Negative Collaboration with trusted institutions may allow herring fishery participants to participate in observations and facilitate monitoring/sampling that will lead to appropriate adjustments of Monitoring/Avoidance Areas and to the development of avoidance strategies; could ultimately reduce costs associated with bycatch avoidance because the industry would likely prioritize cost-effectiveness when developing strategies

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

***Amendment 5 also proposes to establish river herring catch caps in the future, through the framework adjustment or specifications process; the impacts of this provision are not reflected in the table. See Section 3.3.5 for related discussion.*

Measure Description	Potential Impacts of the Management Measures to Address River Herring Bycatch (Section 3.3)			
	VEC 1: Atlantic Herring	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.3.3.2.1, Alternative 3 - River Herring Protection: Option 1 - closed areas	Neutral Not likely to affect total removals of herring from the fishery; many of the blocks proposed for seasonal closure under Alternative 3 overlap substantially with the herring fishery, suggesting that directed herring fishing effort may be reduced, at least seasonally, in some of the areas, but the areas are small and closed for short durations; other fishing activity is likely to occur as well; no benefits to the resource are expected	Potentially Positive May provide river herring protection during at-sea migrations, leading to reductions in mortality; fixed protection areas would not provide river herring mortality protection outside of protection areas; open areas could therefore have increased river herring encounter rates, depending on year-to-year variability associated with river herring distribution	Unknown Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Decreases in revenue in the directed fishery and/or increases in costs of fishing may occur with the closures; trawl fishery participants during the winter season may experience hardship due to the overlap with Protection Areas; may be straight-forward option to enforce; economic and social costs may be incurred though the variability of the hotspots; impact may be mitigated for shrimp fishery and large-mesh bottom trawl vessels if exemption is approved
Section 3.3.3.2.2, Alternative 3 - River Herring Protection: Option 2 - trigger based closed areas	Neutral Not likely to affect total removals of herring from the fishery; many of the blocks proposed for seasonal closure under Alternative 3 overlap substantially with the herring fishery, suggesting that directed herring fishing effort may be reduced, at least seasonally, in some of the areas, but the areas are small and closed for short durations; other fishing activity is likely to occur as well; no benefits to the resource are expected	Potentially Positive May provide river herring protection during at-sea migrations, reducing mortality; fixed protection areas would not provide river herring protection outside of the areas; open areas could therefore have increased river herring encounter rates, depending on year-to-year variability associated with river herring distribution; triggered closures may not be implemented quickly enough to protect river herring during migration	Unknown Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Decreases in revenue in the directed fishery and/or increases in costs of fishing may occur with the closures; trawl fishery participants during the winter season may experience hardship due to the overlap with Protection Areas; economic and social costs may be incurred though the variability of the hotspots, complexity of reporting catch under triggers, and uncertainty associated with reaching the triggers during the fishing year

Potential Impacts of the Management Measures to Address Midwater Trawl Access to Groundfish Closed Areas (Section 3.4)				
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.4.1, Alternatives 1, 2: No Action/ Pre-CAI Provisions	Neutral/Low Negative Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral/Low Negative Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral/Potentially Positive No impact (status quo); Alt 2 increases flexibility and fishing opportunities while decreasing the regulatory burden associated with fishing in CAI
Section 3.4.2, Alternative 3: 100% observer coverage in closed areas	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Low Positive May improve accounting and precision of estimates of discards and/or landed bycatch for non-target species, especially groundfish (i.e. haddock, cod); almost all groundfish catch by herring vessels is haddock, which is already managed under a catch cap	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Impacts depend on funding options for observer coverage; would only create negative impacts on herring-related businesses or communities if Federal funds were not used to pay for the additional observer coverage
Section 3.4.3, Alternative 4: Apply CAI provisions Option 4A - 100% observer coverage Option 4B - Less than 100% observer coverage	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Low Positive Likely to improve accounting of non-target species/other fisheries; may improve estimation of principle bycatch species (herring, haddock, river herring, etc.)	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Minimal direct economic impacts on the herring fishery; however there may be new challenges associated with bringing operational discards on board for some vessels; unknown how measure may affect purse seine operations; diminishing flexibility may result since the vessel operator would be required to provide notice if fishing in any of the closed areas
Section 3.4.4, Alternative 5: Closed Areas - prohibit midwater trawl fishing in year-round closed areas	Neutral/Low Positive Not likely to affect total removals because of shifts in fishing effort; may be beneficial for herring in Georges Bank closures (CAI and CAII) and in the more inshore closures in the Nantucket Lightship Closure, GOM Closure, and Cashes Ledge Closures; may offer protection for biodiversity rich areas	Positive May offer protection against groundfish mortality extended beyond existing gear exclusions; may be beneficial for haddock in GB closures (CAI and CAII) and a diverse suite of species (such as river herring, shad, and mackerel) in the more inshore closures in the Nantucket Lightship Closure, GOM Closure, and Cashes Ledge Closures; may offer protection for biodiversity rich areas	Neutral/ Potentially Low Positive Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Would likely reduce revenues for the midwater trawl fishery; number of midwater trawl trips would likely also decrease; midwater fleet is likely to fish in other, less productive areas while purse seine fleet benefits from their exclusion

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

List of Acronyms

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
AE	Affected Environment
AHE	Affected Human Environment
AM	Accountability Measure
APA	American Pelagic Association
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
BT	Border Transfer
CAI	Closed Area I
CAII	Closed Area II
CAA	Catch at Age
CEQ	Council on Environmental Quality
CHOIR	Coalition for the Atlantic Herring Fishery's Orderly, Informed, and Responsible Long-Term Development
CZMA	Coastal Zone Management Act
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DEA	Data Envelopment Analysis
DMF	Division of Marine Fisheries
DMR	Department of Marine Resources
DEIS	Draft Environmental Impact Statement
DWF	Distant-Water Fleets
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
FMP	Fishery Management Plan
FY	Fishing Year
GB	Georges Bank
GEA	Gear Effects Evaluation
GIFA	Governing International Fisheries Agreement

GMRI	Gulf of Maine Research Institute
GOM	Gulf of Maine
GRT	Gross Registered Tons
HCA	Habitat Closed Area
HPTRP	Harbor Porpoise Take Reduction Plan
ICNAF	International Commission for the Northwest Atlantic Fisheries
IRFA	Initial Regulatory Flexibility Analysis
IOY	Initial Optimal Yield
IVR	Interactive Voice Response
IWC	International Whaling Commission
IWP	Internal Waters Processing
JVP	Joint Venture Processing
LWTRP	Large Whale Take Reduction Plan
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
MR	Maximized Retention
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
NAO	North Atlantic Oscillation
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NLSCA	Nantucket Lightship Closed Area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
NT	Net Tonnage
NSGs	National Standard Guidelines
OCS	Outer Continental Shelf
OFL	Overfishing Limit

OLE	Office of Law Enforcement
OY	Optimum Yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PS/FG	Purse Seine/Fixed Gear
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RH	River Herring
RIR	Regulatory Impact Review
SARC	Stock Assessment Review Committee
SAV	Submerged Aquatic Vegetation
SAW	Stock Assessment Workshop
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
SFA	Sustainable Fisheries Act
TAC	Total Allowable Catch
TALFF	Total Allowable Level of Foreign Fishing
TC	Technical Committee
TRAC	Transboundary Resource Assessment Committee
USAP	U.S. At-Sea Processing
USFWS	US Fish and Wildlife Service
VEC	Valued Ecosystem Component
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
VTR	Vessel Trip Report

Intentionally Blank

Table of Contents

1.0 INTRODUCTION AND BACKGROUND 1
1.1 DOCUMENT ORGANIZATION 2
1.2 BACKGROUND – MANAGEMENT HISTORY AND FMP DEVELOPMENT 3
1.3 NOTICE OF INTENT AND SCOPING PROCESS 6
1.3.1 General Scoping Comments 7
1.3.2 Comments About Bycatch 7
1.3.3 Comments About River Herring (Alewife and Blueback Herring) 7
1.3.4 Comments about Interactions with the Atlantic Mackerel Fishery 7
1.3.5 Comments About the Multispecies (Groundfish) Fishery 8
1.3.6 Comments About Social and Community Impacts 8
1.4 PURPOSE AND NEED FOR ACTION 12
2.0 GOALS AND OBJECTIVES 13
2.1.1 Background – Goals and Objectives for the Herring Fishery Management Program 13
2.1.2 Goals and Objectives of Amendment 5 to the Atlantic Herring FMP 14
2.1.3 Goals and Objectives of the Amendment 5 Catch Monitoring Program 14
3.0 PROPOSED MANAGEMENT ACTION AND OTHER ALTERNATIVES CONSIDERED 16
3.1 ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM 17
3.1.1 Regulatory Definitions (Transfer at Sea and Offload) 17
3.1.2 Administrative/General Provisions 18
3.1.3 Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea 20
3.1.4 Trip Notification Requirements 26
3.1.5 Reporting Requirements for Federally Permitted Herring Dealers 31
3.1.6 Changes to Open Access Permit Provisions for Limited Access Mackerel Vessels in Areas 2/3 34
3.2 CATCH MONITORING: AT-SEA 38
3.2.1 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels 38
3.2.2 Management Measures to Improve/Maximize Sampling At-Sea 50
3.2.3 Measures to Address Net Slippage 53
3.2.4 Maximized Retention Alternative (Experimental Fishery) 60
3.3 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH 63
3.3.1 Alternative 1: No Action 63
3.3.2 Alternative 2: River Herring Monitoring/Avoidance *(Preferred Alternative)* 63
3.3.3 Alternative 3: River Herring Protection 82
3.3.4 Mechanism for Adjusting/Updating River Herring Areas (*Preferred Alternative*) 93
3.3.5 River Herring Catch Caps *(Preferred Alternative)* 94
3.3.6 Summary of Measures Under Consideration to Address River Herring Bycatch 95
3.4 MANAGEMENT MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS 96
3.4.1 Alternatives 1 and 2 97
3.4.2 Alternative 3: 100% Observer Coverage 98

3.4.3 Alternative 4: Closed Area I Provisions *(Preferred Alternative)* 98
3.4.4 Groundfish Alternative 5: Closed Areas 101
3.5 ADDITIONAL MEASURES THAT CAN BE IMPLEMENTED THROUGH A FRAMEWORK ADJUSTMENT TO THE HERRING FMP 102
4.0 MANAGEMENT MEASURES CONSIDERED BUT REJECTED 103
4.1 MEASURES TO ADDRESS QUOTA MONITORING AND REPORTING 103
4.2 MEASURES TO ADDRESS MAXIMIZED RETENTION 105
4.3 MEASURES TO ADDRESS PORTSIDE SAMPLING 107
4.4 OPTIONS TO MAXIMIZE SAMPLING AND ADDRESS NET SLIPPAGE 110
4.5 MEASURES TO REQUIRE ELECTRONIC MONITORING 113
4.6 MEASURES TO REQUIRE CATCH MONITORING AND CONTROL PLANS 113
4.7 OPTIONS FOR FUNDING 114
4.8 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH 115
4.9 OTHER MEASURES CONSIDERED BUT REJECTED 117
5.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT 118
5.1 ATLANTIC HERRING 118
5.1.1 Distribution and Life History 118
5.1.2 Migration 119
5.1.3 Stock Definition 122
5.1.4 Trends in Abundance and Biomass of the Atlantic Herring Resource 122
5.1.5 Importance of Herring as a Forage Species 146
5.2 NON-TARGET SPECIES AND OTHER FISHERIES 152
5.2.1 Non-Target Species 152
5.2.2 Other Fisheries 172
5.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT 205
5.3.1 Physical Environment 205
5.3.2 Essential Fish Habitat (EFH) 210
5.3.3 General Statement About Impacts on Physical Environment and EFH (Background) 225
5.4 PROTECTED RESOURCES 227
5.4.1 Species Present in the Area 227
5.4.2 Species Potentially Affected 230
5.4.3 Interactions Between Gear and Protected Resources 237
5.4.4 Actions to Minimize Interactions with Protected Species 239
5.5 FISHERY-RELATED BUSINESSES AND COMMUNITIES 240
5.5.1 Fishery-Related Businesses 240
5.5.2 Canadian Herring Fisheries 301
5.5.3 Communities 307
6.0 ENVIRONMENTAL CONSEQUENCES OF MANAGEMENT ALTERNATIVES UNDER CONSIDERATION 359
6.1 IMPACTS OF PROPOSED ADJUSTMENTS TO FISHERY MANAGEMENT PROGRAM (SECTION 3.1) 359

6.1.1 Impacts of Regulatory Definitions and Administrative/General Provisions (Sections 3.1.1 and 3.1.2) 359
6.1.2 Impacts of Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea (Sections 3.1.3) 363
6.1.3 Impacts of Trip Notification Requirements (Section 3.1.4) 371
6.1.4 Impacts of Reporting Requirements for Federally Permitted Dealers (Section 3.1.5) 375
6.1.5 Impacts of Changes to Open-Access Permit Provisions for Limited Access Mackerel Vessels in Areas 2/3 (Section 3.1.6) 383
6.2 IMPACTS OF ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE ON LIMITED ACCESS HERRING VESSELS (SECTION 3.2.1) 390
6.2.1 Background 390
6.2.2 Impacts on Atlantic Herring 395
6.2.3 Impacts on Non-Target Species and Other Fisheries 405
6.2.4 Impacts on Physical Environment and EFH 416
6.2.5 Impacts on Protected Resources 417
6.2.6 Impacts on Fishery-Related Businesses and Communities 421
6.3 IMPACTS OF OTHER MEASURES TO ADDRESS CATCH MONITORING AT-SEA (SECTIONS 3.2.2, 3.2.3, AND 3.2.4) 434
6.3.1 Impacts of Management Measures to Improve/Maximize Sampling At-Sea (Section 3.2.2) 434
6.3.2 Impacts of Measures to Address Net Slippage (Section 3.2.3) 437
6.3.3 Impacts of Maximized Retention Alternative 476
6.4 IMPACTS OF MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH (SECTION 3.3) 480
6.4.1 Background Information 481
6.4.2 Impacts on Atlantic Herring 488
6.4.3 Impacts on Non-Target Species and Other Fisheries 491
6.4.4 Impacts on Physical Environment and EFH 502
6.4.5 Impacts on Protected Resources 503
6.4.6 Impacts on Fishery-Related Businesses and Communities 505
6.4.7 Impacts of Option to Establish River Herring Catch Caps (*Preferred Alternative*) 532
6.5 IMPACTS OF MANAGEMENT MEASURES TO ADDRESS MIDWATERAWL ACCESS TO GROUNDFISH CLOSED AREAS 534
6.5.1 Background Information 534
6.5.2 Impacts on Atlantic Herring 535
6.5.3 Impacts on Non-Target Species and Other Fisheries 537
6.5.4 Impacts on Physical Environment and EFH 543
6.5.5 Impacts on Protected Resources 544
6.5.6 Impacts on Fishery-Related Businesses and Communities 545
6.6 CUMULATIVE EFFECTS ANALYSIS 548
6.6.1 Introduction 548
6.6.2 Valued Ecosystem Components (VECs) 548
6.6.3 Spatial and Temporal Boundaries 549
6.6.4 Analysis of Total Cumulative Effects 550
6.6.5 Past, Present, and Reasonably Foreseeable Future Actions 550
6.6.6 Baseline Conditions 568

6.6.7 Summary of Impacts from Amendment 5 Alternatives 570
6.6.8 Cumulative Effects Summary 579
7.0 CONSISTENCY WITH THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (MSFCMA) 581
7.1 NATIONAL STANDARDS 581
7.2 OTHER REQUIRED PROVISIONS OF MSFCMA 591
8.0 RELATIONSHIP TO OTHER APPLICABLE LAW 597
8.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) 597
8.1.1 Introduction/FEIS Table of Contents 597
8.1.2 Summary of Amendment 5 Scoping Process 598
8.1.3 Areas of Controversy and Issues to be Resolved 599
8.1.4 DEIS Comments and Responses 601
8.1.5 FEIS Circulation List 616
8.2 MARINE MAMMAL PROTECTION ACT (MMPA) 617
8.3 ENDANGERED SPECIES ACT (ESA) 617
8.4 PAPERWORK REDUCTION ACT (PRA) 618
8.5 INFORMATION QUALITY ACT (IQA) 618
8.6 IMPACTS ON FEDERALISM/E.O. 13132 620
8.7 ADMINISTRATIVE PROCEDURES ACT (APA) 620
8.8 COASTAL ZONE MANAGEMENT ACT (CZMA) 620
8.9 REGULATORY FLEXIBILITY ACT (RFA)/E.O. 12866 (REGULATORY PLANNING AND REVIEW) 621
8.9.1 Regulatory Flexibility Act (RFA) – Initial Regulatory Flexibility Analysis 621
8.9.2 E.O. 12866 (Regulatory Planning and Review) 623
8.10 E.O. 13158 (MARINE PROTECTED AREAS) 625
9.0 DATA AND RESEARCH NEEDS 626
9.1 AMENDMENT 5 RESEARCH PRIORITIES 626
9.2 OTHER HERRING-RELATED RESEARCH PRIORITIES 627
9.3 OUTREACH PROGRAMS 628
10.0 LIST OF PUBLIC MEETINGS 628
11.0 LIST OF PREPARERS AND AGENCIES CONSULTED 631
12.0 GLOSSARY 632
13.0 INDEX 638
14.0 REFERENCES 641

List of Tables

Table 1 Purpose and Need for Amendment 5 12
Table 2 Summary of Current Letters of Authorization for the Atlantic Herring Fishery 21
Table 3 Summary of Alternatives Under Consideration to Allocate Observer Coverage on Limited Access Herring Vessels 49
Table 4 Sub-Options for River Herring Catch Triggers (Pounds) 71
Table 5 Sub-Options for River Herring Catch Triggers (Pounds) 85
Table 6 Proposed Action: Additional Measures that can be Implemented through a Framework Adjustment and/or Herring Fishery Specifications Process 102
Table 7 Number of Herring Tagged by Year, Spatial and Temporal Strata 2003-2006 119
Table 8 NMFS Trawl Survey – Herring Catch Per Tow (Mean Number and Weight in kg), 1990-2011 123
Table 9 Atlantic Herring Biological Reference Points 141
Table 10 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2009-2011 154
Table 11 Number of Observed Trips 2009/2010 by Gear, Category, and Six-Month "Season" 155
Table 12 Catch and Discards of All Species on Observed Trips, 2009-2010, Paired and Single Midwater Trawl, Permit Category A and B 156
Table 13 Catch and Discards of All Species on Observed Trips, 2009-2010, Purse Seine, Permit Category A and B 157
Table 14 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Large Mesh (>5.5 inch) 158
Table 15 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Small Mesh (<5.5 inch) 159
Table 16 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Large Mesh (>5.5) 160
Table 17 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Small Mesh (<5.5 inch) 161
Table 18 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Large Mesh (>5.5 inch) 162
Table 19 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Small Mesh (<5.5 inch) 163
Table 20 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Unknown Mesh Size 164
Table 21 Total Number of Trips Observed for the Directed Atlantic Herring Fishery in Area 1A (Small Mesh Area 1) and Area 2 (Rhode Island) 165
Table 22 Total Catch (Retained and Discards) in Pounds of Species Observed on SMBT Fishing Trips During 2010 and 2011 in Area 1A – Small Mesh Area 1 166
Table 23 Total Catch (Retained and Discards) in Pounds of Species Observed on SMBT Fishing Trips During 2010 in Area 2 167
Table 24 Bycatch Ratios on Top Six Trips Sampled by MA DMF 171
Table 25 Typical Migration Patterns and Locations for American Shad 174
Table 26 Typical Migration Patterns and Locations for Blueback Herring 176
Table 27 Typical Migration Patterns and Locations for River Herring 177

Table 28 Commercial Shad Landings (lbs.) by State from Maine to New Jersey, 1970-2010 184
Table 29 Commercial River Herring Landings (lbs.) by State from Maine to New Jersey, 1960-2010 .. 185
Table 30 2011 State-Reported River Herring Catch 186
Table 31 NAFO River Herring Catch by Country 188
Table 32 Summary of Mackerel Limited Access Program and Predicted Number of Qualifiers 191
Table 33 Mackerel Quota Performance 194
Table 34 Atlantic Mackerel Landings (%) by Gear 195
Table 35 Stock Status Summary (Biomass), February, 2012 (13 Groundfish Stocks) 203
Table 36 Stock Status Summary (Fishing Mortality) February, 2012 (13 Groundfish Stocks) 204
Table 37 – EFH Designation of Estuaries and Embayments for Atlantic Herring 211
Table 38 – Demersal Species/Lifestages for Which Designated EFH Overlaps with the Atlantic Herring Fishery, Listed Alphabetically by Common Name 216
Table 39 – Listing of Sources for current EFH Designation Information* 223
Table 40 Species Protected Under the ESA and MMPA That May Occur in the Operations Area for the Atlantic Herring Fishery 229
Table 41 Descriptions of the Tier 2 Fishery Classification Categories 237
Table 42 Marine Mammals Impacts Based on Herring Gear (Based on 2012 List of Fisheries) 238
Table 43 Number of MWT Incidental Takes Recorded by Fisheries Observers 239
Table 44 Total Landings (Metric Tons) of Atlantic Herring from VTR Data, 1960-2010 241
Table 45 2010-2012 Atlantic Herring Fishery Specifications (Metric Tons) 243
Table 46 Atlantic Herring Catch by Year and Management Area, 2003-2012 245
Table 47 Atlantic Herring Discard Estimates 2010 – 2011 247
Table 48 Atlantic Herring Catch – 2011 and 2012 Overages and Resulting 2013 and 2014 Sub-ACLs 248
Table 49 Number of Vessels by Atlantic Herring Permit Category, 2008-2010 249
Table 50 “Active” vs. “Latent” Vessels by Category, 2008-2010 249
Table 51 Number of Other Federal Permits Held by Herring Category Permit Held, 2008-2010 250
Table 52 Total Revenue (Thousands of Nominal Dollars) and Landings (Thousands of Pounds), by Species Caught and Vessel Category, 2007-2010 255
Table 53 Percent Dependence of Herring Vessels on Different Species by Category, Calculated Using Revenue 256
Table 54 Total Revenue (Thousands of Dollars) and Landings (Thousands of Pounds) of All Species by Landed States and Species, 2007-2010 257
Table 55 Top Ports of Landing (State and City) and Total Revenue (Thousands of Dollars), 2007-2010 258
Table 56 Distribution of Herring Vessel Length for Category A and B Vessels, 2008-2010 259
Table 57 Number of Category A and B Herring Vessels by Permit Category and Principal Port, 2008-2010 260
Table 58 Average Crew Size (Including Captain) by Home Port for Category A and B Vessels, 2008-2010 261
Table 59 Average Crew Size (Including Captain) by Gear Category (A and B), 2008-2010 261
Table 60 Atlantic Herring Landings (Thousands of Pounds) for Federally Permitted Herring Vessels by Area Fished, Gear Type and Permit Category (A and B), 2008– 2010 262
Table 61 Category A Atlantic Herring Landings by Gear Type, as a Percent of Category A Herring Landings and Total Herring Landings, 2008-2010 262
Table 62 Herring Category A and B/C Vessel Landings by Species, 2008-2010 263

Table 63 Distribution of Herring Vessel Length for Category C Vessels, 2008-2010 264
Table 64 Number of Category C Herring Vessels by Principal Port, 2008-2010 265
Table 65 Average Crew Size (Including Captain) by Home Port for Category C Vessels, 2008-2010 .. 266
Table 66 Average Crew Size (Including Captain) by Gear Type for Category C Vessels, 2008-2010 ... 266
Table 67 Atlantic Herring Landings (Thousands of Pounds) for Category C Vessels by Area Fished and Gear Type, 2008 – 2010 267
Table 68 Category C Atlantic Herring Landings by Gear Type, as a Percent of Category C Herring Landings and Total Herring Landings, 2008-2010 267
Table 69 Herring Category C Vessel Landings by Species, 2008-2010 268
Table 70 Distribution of Herring Vessel Length for Category D Vessels, 2008-2010 269
Table 71 Number of Category D Herring Vessels by Principal Port State, 2008-2010 269
Table 72 Average Crew Size (Including Captain) by Home Port for Category D Vessels, 2008-2010 .. 270
Table 73 Average Crew Size (Including Captain) by Gear Type for Category D Vessels, 2008-2010 ... 271
Table 74 Atlantic Herring Landings (000's of pounds) for Category D Vessels by Area Fished and Gear Type, 2008 – 2010 271
Table 75 Category D Atlantic Herring Landings by Gear Type, as a Percent of Category D Herring Landings and Total Herring Landings, 2008-2010 272
Table 76 Herring Category D Vessel Landings by Species, 2008-2010 272
Table 77 2010 Herring Permits by Category and Herring/Multispecies Combinations 273
Table 78 Herring Trips, Days, and Herring Landed (thousands of pounds) by Area Caught and Category Permit, 2008-2010 274
Table 79 Herring Trips, Days, and Herring Landed (thousands of pounds) by Area Caught and Gear Type, 2008-2010 275
Table 80 Yearly Number of Federally Permitted Dealers Who Purchased Herring, by State of Registration 277
Table 81 Revenue (thousands of dollars) and Landings (thousands of pounds) Purchased by Federally Permitted Dealers, by state of purchase 278
Table 82 Percent of Herring Purchased by Federally Permitted Dealers, by State of Registration, 2007-2010 279
Table 83 Total Herring Vessels that Received a Letter of Authorization (LOA) by Year and Type of Exemption 280
Table 84 Total VTR Herring Carrier Reports by Year; Only Herring Carrier Activity That Was Reported 281
Table 85 Vessel Permit and Size Information for Herring Vessels Carrying LOAs, 2009 282
Table 86 Vessel Permit and Size Information for Herring Vessels Carrying LOAs, 2010 283
Table 87 Commercial Landings of Total Tuna by Location, 2009 294
Table 88 Summary of New England Whale Watching Statistics, 1998 and 2008 300
Table 89 Historical Series of Annual Landings (t) by Major Gear Components and Seasons of the 4WX Herring Fishery, 1963-2010 302
Table 90 Total Atlantic Herring Catch During, 1964 – 2011 304
Table 91 Number of Active Weirs and the Catch per Weir in the New Brunswick, Canada Fishery from 1978-2011 305
Table 92 Monthly Weir Landings (mt) for Weirs Located in New Brunswick, 1978-2010 306
Table 93 Portland Dollar Value by Species 1997-2008 314
Table 94 Portland Vessel Permits/Landings Values 1997-2010 314
Table 95 Rockland Dollar Value by Species 1997-2008 316

Table 96 Rockland Vessel Permits/Landings 1997-2010 317
Table 97 Stonington Dollar Value by Species 1997-2010 319
Table 98 Stonington Vessels Permits/Landings 1997-2010 319
Table 99 Deer Isle Dollar Values by Species 321
Table 100 Deer Isle Vessel Permits/Landings Value 1997-2010 321
Table 101 Vinalhaven Value by Species 1997-2008 323
Table 102 Vinalhaven Vessel Permits/Landings Value Between 1997 and 2010 323
Table 103 Phippsburg Dollar Values by Species 1997-2008 328
Table 104 Phippsburg Vessels Permits/Landings Values 1997-2010 328
Table 105 Newington Dollar Value by Species 1997-2008 330
Table 106 Newington Vessel Permits/Landings Value 1997-2010 331
Table 107 Portsmouth, Average Annual Value of Landings by Species 333
Table 108 Portsmouth Vessel Permits/Landings Value 1997-2010 333
Table 109 Dollar Value by Federally Managed Groups of Landings in Hampton 335
Table 110 Hampton Vessel Permits/Landings Value 1997-2010 336
Table 111 Seabrook Dollar Value by Species 1997-2008 338
Table 112 Seabrook Vessel Permits/Landings Value 1997-2010 338
Table 113 Landings in Pounds for State-Only Permits in Gloucester 341
Table 114 Gloucester Vessel Landings Average Annual Value 1997-2008 342
Table 115 Gloucester Vessel Permits/Landings Value 1997-2010 342
Table 116 Landings in Pounds for State-Only Permits in New Bedford in 2003 346
Table 117 New Bedford Average Annual Value 1997-2008 347
Table 118 New Bedford Vessel Permits/Landings Values 1997-2010 347
Table 119 Narragansett (Point Judith) Average Annual Dollar Value of Landings by Species 1997-2008 350
Table 120 Narragansett (Point Judith) Vessel Permits/Landings Value 1997-2010 350
Table 121 Newport Dollar Values of Landings by Species 1997-2008 352
Table 122 Newport Vessel Permits/Landings Value 1997-2010 353
Table 123 North Kingstown Dollar Values of Landings by Species 1997-2008 355
Table 124 North Kingston Vessel Permits/Landings Value 1997-2010 355
Table 125 Cape May Dollar Values of Landings by Species 1997-2008 357
Table 126 Cape May Vessel Permits/Landings Value 1997-2010 358
Table 127 VTR-Reported Herring Catch (Pounds) Sold At-Sea/Retained as Bait 369
Table 128 Summary of Examples Used to Characterize Impacts of Dealer Reporting Options 378
Table 129 Summary of Impacts of Dealer Reporting Sub-Options 382
Table 130 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits (from Amendment 5 DEIS) 388
Table 131 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits (Updated Based on 2011 Data) 389
Table 132 Number of NEFOP and VTR Trips and Percentage Observer Coverage for SBRM 2009, 2012, and 2011 Years 399
Table 133 Total Trips by Fishery, Landings, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Atlantic Herring) 402
Table 134 Combined Trips, Average Length of Trips, and Total Observer Days Needed to Meet CV Targets by Strata (Based on 2010) 403

Table 135 Total Trips by Fishery, Landings, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (River Herring) 411
Table 136 Landings Total Trips by Fishery, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Haddock) 412
Table 137 Combined Trips, Average Length of Trips, and Total Observer Days Needed to Meet CV Targets by Strata (Based on 2010) 413
Table 138 2008-2010 Average Revenues/Costs Per Day and Average Revenues/Costs Per Trip for Category A/B/C Herring Vessels 423
Table 139 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs for Category A/B/C Herring Vessels 423
Table 140 2008-2010 Average Revenues/Costs Per Day and Average Revenues/Costs Per Trip for Category A and B Herring Vessels 424
Table 141 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs for Category A and B Herring Vessels 425
Table 142 Aggregate Days Fished and Observer Costs for 2000-2009 by Herring Permit Category 428
Table 143 Number of Trips and Days Fished By Category C Herring Permit Holders 429
Table 144 Relationship of SBRM Fleets to Herring Limited Access Vessels 431
Table 145 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2007-2011 439
Table 146 Summary of NEFOP Observer Coverage Levels by Gear Type, 2009 440
Table 147 Observer Program Coverage Rates for 2009-2010, by Gear and Permit Category 440
Table 148 Frequency of Released Catch Events 2008/2009 442
Table 149 Summary of 2010 Observed Events on Limited Access Herring Vessels (by Number and Estimated Weight of Fish in Lbs.) with Fish Not Brought on Board 448
Table 150 Summary of 2011 Observed Events on Limited Access Herring Vessels – Declared Herring Trips (by Number and Estimated Weight of Fish in lbs.) with "*Fish Not Brought on Board*" Codes 456
Table 151 Summary of NEFOP 2011 Released Catch Data from Limited Access Vessels on Declared Herring Trips (Number of Hauls by Gear and Area) 459
Table 152 Summary of NEFOP 2011 Released Catch Data from Limited Access Vessels on Declared Herring Trips (Number of Pounds by Gear and Area) 460
Table 153 Quantification of Fish NK and Herring NK (in Pounds) on Observed Hauls by Limited Access Herring Vessels in 2010 463
Table 154 Quantification of Fish NK and Herring NK (in Pounds) on Observed Hauls by Limited Access Herring Vessels in 2011 464
Table 155 Potential Impacts of Catch Deduction/Trip Termination Options (Based on 2010 Observer Data) 475
Table 156 River Herring Catch Comparison for 2010 Data 486
Table 157 Summary of Seasonal River Herring Hotspot Analysis Using NMFS Bottom Trawl Surveys 492
Table 158 Biological – River Herring-Focused Trade-offs of Spatial Management Approaches 500
Table 159 Biological – Other Small Pelagics-Focused Trade-offs of Spatial Management Approaches 501
Table 160 2008-2010 Average Revenues, Costs Per Day and Average Revenues, Costs Per Trip for Category A/B/C Herring Vessels 508
Table 161 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs . 508

Table 162 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1A, if This Option had been Effective in 2010 510
Table 163 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1B, if This Option had been Effective in 2010 510
Table 164 Fishing Time (Hours) Inside and Outside the Monitoring Areas 510
Table 165 Fishing Time (%) Inside and Outside the Monitoring Areas 511
Table 166 Herring Catch (lbs.) Inside and Outside the Monitoring Areas 511
Table 167 Herring Catch (%) Inside and Outside the Monitoring Areas 511
Table 168 Herring Revenue ($) Inside and Outside the Monitoring Areas 511
Table 169 Herring Revenue (%) Inside and Outside the Monitoring Areas 512
Table 170 Total Revenue ($) Inside and Outside the Monitoring Areas 512
Table 171 Total Revenue (%) Inside and Outside the Monitoring Areas 512
Table 172 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Monitoring Areas by Limited Access Herring Permit Category 513
Table 173 Fishing Time (Hours) Inside and Outside the River Herring Protection Areas 519
Table 174 Fishing Time (%) Inside and Outside the River Herring Protection Areas 519
Table 175 Herring Catch (lbs.) Inside and Outside the River Herring Protection Areas 519
Table 176 Herring Catch (%) Inside and Outside the River Herring Protection Areas 519
Table 177 Herring Revenue ($) Inside and Outside the River Herring Protection Areas 520
Table 178 Herring Revenue (%) Inside and Outside the River Herring Protection Areas 520
Table 179 Total Revenue ($) Inside and Outside the River Herring Protection Areas 520
Table 180 Total Revenue (%) Inside and Outside the River Herring Protection Areas 520
Table 181 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Protection Areas by Limited Access Herring Permit Category 521
Table 182 Number of Vessels by Atlantic Herring Permit Category, 2008-2010 522
Table 183 Number of Observed Trips and Percent Coverage in the Gulf of Maine Northern Shrimp Fishery, 2005-2010 523
Table 184 Total Catch Observed in the Northern Shrimp Fishery (Retained and Discarded) in Pounds by Species (2005-2010) 524
Table 185 Number of Shrimp Trips in 2010 by Herring and Non-Herring Permit Categories 525
Table 186 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Large Mesh (>5.5 inch) 525
Table 187 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Large Mesh (>5.5) 526
Table 188 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Large Mesh (>5.5 inch) 526
Table 189 Economic – Atlantic Herring Fishery Participants Focused Trade-offs of Spatial Management Approaches 528
Table 190 Social – Focused Trade-offs of Spatial Management Approaches 529
Table 191 Monitoring – Focused Trade-offs of Spatial Management Approaches 530
Table 192 – Summary of Catch (Pounds) on Observed MWT Trips to GB in CY 2010 538
Table 193 FY 2010 (May 1 – April 30) Commercial Haddock Catch (mt) 541
Table 194 Herring Fishing Effort and Revenues in the Groundfish Closed Areas in 2010 546
Table 195 Number of Trips and Observer Days Projected for 100% Coverage in Year-Round Groundfish Closed Areas 547

Table 196 Terms Used in Tables to Summarize Cumulative Impacts 549
Table 197 Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC) 555
Table 198 Summary Effects of Past, Present, and Reasonably Foreseeable Future Actions on the VECs Identified for Amendment 5 567
Table 199 Cumulative Effects Assessment Baseline Conditions of the VECs 568
Table 200 List of Public Meetings Related to the Development of Amendment 5 629

Intentionally Blank

List of Figures

Figure 1 Atlantic Herring Fishery Management Areas 4
Figure 2 Alternative 2: River Herring Monitoring/Avoidance Areas January – February 64
Figure 3 Alternative 2: River Herring Monitoring/Avoidance Areas March – April 65
Figure 4 Alternative 2: River Herring Monitoring/Avoidance Areas May – June 65
Figure 5 Alternative 2: River Herring Monitoring/Avoidance Areas July – August 66
Figure 6 Alternative 2: River Herring Monitoring/Avoidance Areas September – October 66
Figure 7 Alternative 2: River Herring Monitoring/Avoidance Areas November – December 67
Figure 8 River Herring Catch Trigger Areas (Shaded) 71
Figure 9 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for January – February 76
Figure 10 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for March – April 76
Figure 11 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for May – June 77
Figure 12 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for July – August 77
Figure 13 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for September – October 78
Figure 14 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for November – December 78
Figure 15 Alternative 3: River Herring Protection Areas January – February 82
Figure 16 Alternative 3: River Herring Protection Areas March – April 83
Figure 17 Alternative 3: River Herring Protection Areas September – October 83
Figure 18 Alternative 3: River Herring Protection Areas November – December 84
Figure 19 River Herring Catch Trigger Areas (Shaded) 86
Figure 20 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for January – February 91
Figure 21 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for March – April 91
Figure 22 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for September – October 92
Figure 23 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for November – December 92
Figure 24 Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch 95
Figure 25 Year-Round Multispecies Closed Areas (Solid Shading) 96
Figure 26 Tagging Locations (gray dots) and Returns (black dots) from Atlantic Herring Released in the GOM During the Summer Feeding and Spawning 120
Figure 27 Tagging Locations (gray dots) and Returns (black dots) from Atlantic Herring Released in SNE During the Winter Feeding 120
Figure 28 Herring Mean Number Per Tow Indices from the NMFS Spring and Autumn Survey Through 2011 124

Figure 29 Herring Mean Number Per Tow Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1963-2010 125
Figure 30 Herring Mean Weight Per Tow (Kilograms) Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1963-2010 126
Figure 31 Herring Mean Number Per Tow Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1968-2011 126
Figure 32 Herring Mean Weight Per Tow (Kilograms) Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1968-2011 127
Figure 33 MA DMF Spring Survey Stratified Mean Number per Tow for Strata 25-36 128
Figure 34 MA DMF Fall Survey Stratified Mean Number per Tow for Strata 25-36 129
Figure 35 Number of MA DMF Spring (1978-2010) and Fall (1978-2010) Survey Tows That Encountered Herring as a Proportion of Total Tows for Strata 25-36 130
Figure 36 Stratified Mean Number per Tow at Length for MA DMF Spring Survey, 1978-2010 131
Figure 37 Proportion of Mean Number per Tow at Length for MA DMF Spring Survey, 1978-2010 ... 132
Figure 38 Stratified Mean Number per Tow at Length for MA DMF Fall Survey, 1978-2010 133
Figure 39 Proportion of Mean Number per Tow at Length for MA DMF Fall Survey, 1978-2010 134
Figure 40 ME DMR Fall Inshore Bottom Trawl Survey Catch (# Fish) Per Tow 136
Figure 41 ME DMR Spring Inshore Bottom Trawl Survey Catch (# Fish) Per Tow 136
Figure 42 Length Frequencies for Herring Sampled by the ME DMR Fall Inshore Bottom Trawl Survey 137
Figure 43 Length Frequencies for Herring Sampled by the ME DMR Spring Inshore Bottom Trawl Survey 137
Figure 44 Survey Areas of the Atlantic Herring Acoustic Survey 138
Figure 45 Atlantic Herring Acoustic Index of Abundance on Georges Bank (Biomass Estimates with Standard Error), 1999-2011 139
Figure 46 Total Weight at Age for the Atlantic Herring Stock Complex Through 2010 143
Figure 47 Total Length at Age for Inshore Spawners (>230 mm and > GSI 0.10) Through 2010 144
Figure 48 Completed Maine Herring Time Series, Reported and Predicted Values, 1871-2007 145
Figure 49 Completed Canadian Herring Time Series, Reported and Predicted Values, 1871-2007 146
Figure 50 Total Consumption of Gulf of Maine–Georges Bank Atlantic Herring by All Predators, Including Fishing, 1959–2002 148
Figure 51 Comparison of Atlantic Herring Biomass and Predation Mortality Rate (M2) in the Gulf of Maine–Georges Bank Region, 1959–2002 148
Figure 52 Consumptive Removals of Herrings (Clupeidae) by Thorny Skate, 1976-2005 151
Figure 53 Area of Focus for Winter 2011 Bycatch Avoidance System 170
Figure 54 NEFOP Observed Midwater Trawl Tows from January 2000-September 2010 Ranked Lowest to Highest by Amount of Bycatch 171
Figure 55 2011 River Herring Regulations for Commercial Vessels 179
Figure 56 2011 River Herring Regulations for the Recreational Fishery 180
Figure 57 NAFO Convention Area 187
Figure 58 NAFO River Herring Catches, 1960-2009 189
Figure 59 Atlantic Mackerel Landings Within 200 Miles of the US Coast (2010 preliminary) 193
Figure 60 US and Canadian Atlantic Mackerel Landings (2010 preliminary) 193
Figure 61 Georges Bank Haddock Catch Projections, 2011 198
Figure 62 Georges Bank Haddock SSB Projections, 2011 199

Figure 63 Gulf of Maine Haddock Spawning Stock Biomass, 2012 200
Figure 64 Atlantic Herring Management Areas and the Northeast U.S. Shelf Ecosystem 205
Figure 65 – EFH Designation for Atlantic Herring Eggs 212
Figure 66 – EFH Designation for Atlantic Herring Larvae 213
Figure 67 – EFH Designation for Atlantic Herring Juveniles 214
Figure 68 – EFH Designation for Atlantic Herring Adults 215
Figure 69 Total Landings (Metric Tons) of Atlantic Herring from VTR Data, 1960-2010 242
Figure 70 Total Annual Landings (Thousands of Pounds) and Value of Herring (Thousands of 2009 Dollars), 2004 -2010 252
Figure 71 Total Landings (Thousands of Pounds) and Average Price Per Pound (Dollars), 2005 - 2010 254
Figure 72 Number of Federally Permitted Dealers Registered as Herring Dealers, by Purchase Status, 2007-2010 276
Figure 73 Percentage of Herring Landings Reported for Food and Bait Usage 2000-2010 292
Figure 74 The International Commission for the Conservation of Atlantic Tunas (ICCAT) Convention Area 295
Figure 75 Relationship Between Precision Surrounding Estimates of River Herring Bycatch and the Number of Observed Trips 407
Figure 76 Analysis of Comments Regarding Released Catch 2008/2009 443
Figure 77 Analysis of Comments Regarding Released Catch 2008/2009 (continued) 444
Figure 78 Information About Full and Partial Slippage Events 2008/2009 444
Figure 79 Analysis of Comments Regarding Released Catch 2008/2009 by Gear Type 445
Figure 80 Observed Events on Limited Access Herring Vessels (by Number of Hauls) with Fish Not Brought on Board in 2010 449
Figure 81 Observed Events on Limited Access Herring Vessels (by Estimated Weight of Fish in Pounds) with Fish Not Brought on Board in 2010 450
Figure 82 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Number of Hauls) in 2010 451
Figure 83 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Estimated Weight) in 2010 452
Figure 84 Summary of 2010 Observed Catch (Pounds) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition 453
Figure 85 Summary of 2010 Observed Discards (as Percent of Total Observed Catch) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition 454
Figure 86 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (by Species and Number of Hauls) 457
Figure 87 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (By Species and Estimated Weight of Fish in Pounds) 458
Figure 88 Summary of 2011 Observed Catch (Pounds) on Limited Access Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition 460
Figure 89 Summary of 2011 Observed Discards (as Percent of Total Observed Catch) on Limited Access Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition 461
Figure 90 Proposed River Herring Monitoring/Avoidance Areas (Alternative 2, *Preferred Alternative*) 482
Figure 91 Proposed River Herring Protection Areas (Alternative 3) 483

Figure 92 Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch 484
Figure 93 2010 Midwater Trawl Trips in CAI and CAII 539
Figure 94 2010 Midwater Trawl Trips in CAI and CAII 540

AMENDMENT 5 TO THE ATLANTIC HERRING FMP

1.0 INTRODUCTION AND BACKGROUND

This amendment document and final environmental impact statement (FEIS) proposes and analyzes management measures to achieve specific goals and objectives for the Atlantic herring fishery. This document was prepared by the New England Fishery Management Council and its Herring Plan Development Team (PDT), in consultation with the National Marine Fisheries Service (NMFS, NOAA Fisheries), the Atlantic States Marine Fisheries Commission (ASMFC), and the Mid-Atlantic Fishery Management Council (MAFMC). This amendment is developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, MSA) and the National Environmental Policy Act (NEPA), the former being the primary domestic legislation governing fisheries management in the U.S. Exclusive Economic Zone (EEZ). In 1996, Congress passed the Sustainable Fisheries Act (SFA), which amended and reauthorized the MSA and included a new emphasis on precautionary fisheries management. New provisions mandated by the SFA require managers to end overfishing and rebuild overfished fisheries within specified time frames, minimize bycatch and bycatch mortality to the extent practicable, and identify and protect essential fish habitat (EFH). The MSA was again reauthorized in 2007 to require the establishment of annual catch limits (ACLs) and accountability measures (AMs) in order to end and/or prevent overfishing in all FMPs. The proposed amendment is also consistent with the provisions contained in the reauthorized MSA, implemented in Amendment 4 to the Herring FMP.

Although this FMP amendment has been prepared primarily in response to the requirements of the MSA and NEPA, it also addresses the requirements of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). When preparing a Fishery Management Plan or FMP amendment, the Council also must comply with the requirements of the Regulatory Flexibility Act (RFA), the Administrative Procedures Act (APA), the Paperwork Reduction Act (PRA), the Coastal Zone Management Act (CZMA), the Information Quality Act (IQA), and Executive Orders 13132 (Federalism), 12898 (Environmental Justice), 12866 (Regulatory Planning), and 13158 (Marine Protected Areas). These other applicable laws and executive orders help ensure that in developing an FMP/amendment, the Council considers the full range of alternatives and their expected impacts on the marine environment, living marine resources, and the affected human environment. This integrated document contains all required elements of the FMP amendment, including a FEIS as required by NEPA and information to ensure consistency with other applicable laws and executive orders.

1.1 DOCUMENT ORGANIZATION

This document is organized into the following volumes:

Volume I: Final Amendment 5/FEIS Document

Volume I includes the Final Amendment as well as its Final Environmental Impact Statement (FEIS) and an evaluation of impacts relative to other applicable laws. Volume I provides the background and context for Amendment 5 (Affected Environment), describes in detail the proposed management action as well as all of the management alternatives considered by the Council during the development of the amendment, provides detailed information about all of the components of the ecosystem and fishery potentially affected by the measures proposed in Amendment 5, evaluates the potential impacts of the proposed action and other management alternatives, addresses the Amendment 5 alternatives with respect to the National Environmental Policy Act (NEPA) as well as other applicable laws, and provides the public and the Council with adequate information about the measures and their expected impacts.

Volume II: Amendment 5 Appendices

Appendix I. Discussion Paper: *Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery*

Appendix II. Herring PDT Portside Sampling/Sea Sampling Data Analysis

IIA. *Comparison of (Landed) Bycatch Estimates from Portside and At-Sea Observer Sampling Programs in the Atlantic Herring Fishery* (July 2010)

IIB. *A Comparison of Portside and At-Sea Sampling Methods of Estimating Bycatch in the Atlantic Herring Fishery* (May 2011)

Appendix III. *Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*

Appendix IV. Herring PDT Analysis: Development of Measures to Address River Herring Bycatch

IVA. *Identification of river herring hotspots at sea using multiple fishery dependent and independent datasets* (July 2010)

IVB. *Update: Identification of river herring hotspots at sea using fisheries dependent and independent datasets (8/30/2010)*

IVC. *Update (Supplemental Material): Identification of river herring hotspots at sea using fisheries dependent and independent datasets (8/30/2010)*

IVD. *Spatial Management Alternatives to Address River Herring Bycatch in the Directed Atlantic Herring Fishery* (12/20/2010)

Appendix V. *Spatial and Temporal Analysis of River Herring Bycatch in the Northern Shrimp Fishery* (Cournane November 2011)

Appendix VI. *Detailed Analysis of Impacts of Management* Measures Under Consideration in Amendment 5 to Address River Herring Bycatch

Appendix VII. Discussion Paper: *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery* (December 2010)

Appendix VIII. Discussion Paper: *Summary of Available Information and Management Approaches to Addressing Spawning Atlantic Herring*

Appendix IX. Amendment 5 Written Comments

Appendix X. Amendment 5 Public Hearing Summaries

1.2 BACKGROUND – MANAGEMENT HISTORY AND FMP DEVELOPMENT

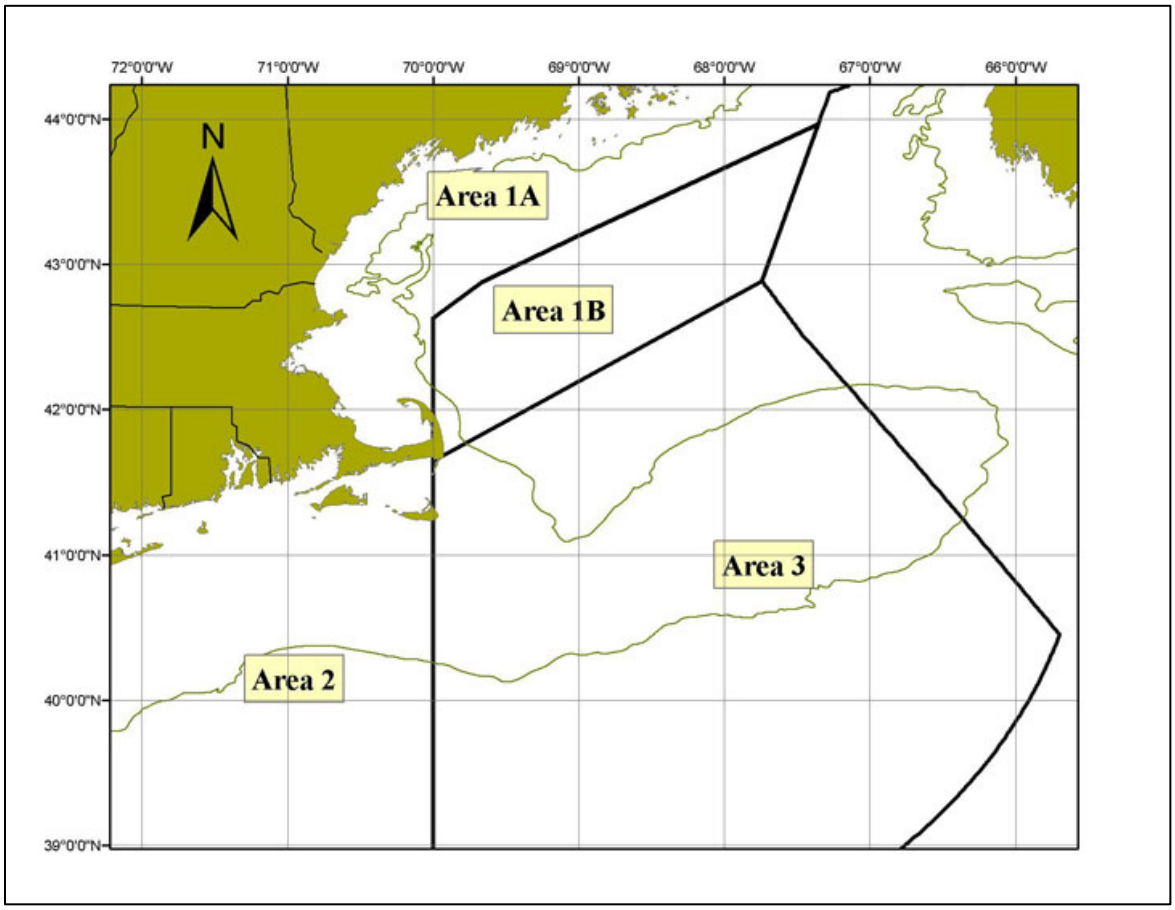
Atlantic herring stocks were first managed in 1972 through the International Commission for the Northwest Atlantic Fisheries (ICNAF). ICNAF regulated the international fishery until the United States withdrew from the organization in 1976 with the passage of the Magnuson Fishery Conservation and Management Act (MSA). From 1976-1978, the National Marine Fisheries Service (NMFS, NOAA Fisheries) developed a Preliminary Management Plan (PMP) to regulate foreign fishing for herring in the U.S. Exclusive Economic Zone (EEZ). Under the aegis of the MSFCMA, the newly-established New England Fishery Management Council (NEFMC) developed a Fishery Management Plan (FMP) for Atlantic herring, which was approved by the Secretary of Commerce and implemented on December 28, 1978. In 1982, NMFS withdrew the Federal Herring FMP once it became clear that catch quotas for adult herring in the Gulf of Maine were not enforced in State waters. In the absence of a Federal FMP, Atlantic herring was placed on the prohibited species list, thereby eliminating directed fisheries by foreign nationals or joint ventures in the EEZ and requiring any herring bycatch by such vessels to be discarded.

While directed fishing for Atlantic herring was prohibited in Federal waters in 1983, the herring fishery in State waters was managed through an agreement among the States of Maine, New Hampshire, Massachusetts, and Rhode Island. The final draft of the "Interstate Herring Management Plan of Maine, New Hampshire, Massachusetts, and Rhode Island" was adopted in late 1983 and formally recognized by the Atlantic States Marine Fisheries Commission (ASMFC) in 1987. The premise of the Interstate Herring FMP was to gather information to further develop and facilitate the implementation of a more robust management program for Atlantic herring in the future. The Interstate FMP also protected spawning herring through spawning closures and promoted complementary management throughout the species' range.

As the size of the resource grew, so did the interest in Internal Water Processing (IWP) operations. It became clear that the 1983 Interstate FMP was no longer adequate to manage the U.S. Atlantic herring resource. Utilizing spawning closures as the primary management tool, the agreement was not comprehensive enough to maintain a healthy resource or equitably distribute IWP shares between the States with IWP applicants. In 1993, a second Memorandum of Understanding (MOU) was circulated among the States of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York and New Jersey. Through the MOU, the participating States demonstrated their intent to cooperatively manage Atlantic herring. The ASMFC developed the Atlantic Herring Fishery Management Plan in 1993 to address the growth of the herring resource, formalize the allocation process for IWP shares, and lay the foundation for a joint ASMFC-NEFMC management plan (ASMFC 1993).

The New England Council's Herring FMP became effective on January 10, 2001 and included administrative and management measures to ensure effective and sustainable management of the herring resource. The FMP establishes Total Allowable Catches (TACs, now referred to as sub-ACLs) for each of four management areas as the primary control on fishing mortality (see Figure 1 for current herring management areas).

Figure 1 Atlantic Herring Fishery Management Areas



Other elements of the Federal Herring FMP include requirements for vessel, dealer, and processor permits as well as reporting requirements and restrictions on the size of vessels that can take, catch, or harvest herring. Framework Adjustment 1 to the Council's Herring FMP was implemented for the 2002 fishing year (January 1, 2002 – December 31, 2002) and currently remains in effect. Framework 1 split the TAC for Area 1A (inshore Gulf of Maine/GOM) into two seasonal components in an attempt to prevent an early closure of the fishery in 1A when the TAC is reached.

Amendment 1 to the Herring FMP was submitted in 2006 to improve resource conservation, address new scientific information to the extent possible, minimize the potential for excess harvesting capacity in the fishery, and provide a platform to promote long-term economic stability for harvesters, processors, and fishing communities. The primary purpose of Amendment 1 was to modify the management program for the Atlantic herring fishery by implementing:

- A limited access program for all management areas in the Atlantic herring fishery – separate limited access program for Area 1 and Areas 2/3 with two-tier permit system to qualify vessels for a directed fishery and an incidental catch fishery; limited access permit provisions consistent with those in other Northeast Region limited access fisheries; open access incidental catch permit and 3 mt possession limit for vessels that do not qualify for any limited access permits and catch small amounts of herring incidentally;

- Adjustments to herring management area boundaries – re-specification of Area 3 and consequent modifications to the boundaries for Areas 1B and 2;
- Establishment of a seasonal purse seine/fixed gear-only area – all of Area 1A from June – September of each fishing year;
- Specification of a proxy for maximum sustainable yield (220,000 mt);
- Adjustments to the herring fishery specification process, including a more flexible process for determining the distribution of TACs, a process for multi-year specifications (three fishing years); and a process for establishing TAC set-asides for research;
- Measures to address fixed gear fisheries, including an approach to account for the Downeast ME fixed gear fishery catch as part of the New Brunswick weir fishery catch when determining fishery specifications, and a 500-mt set-aside of the TAC in Area 1A for the remainder of fixed gear fisheries in this area until November 1 of each year; and
- Changes to the regulatory definition of midwater trawl gear.

Amendment 2 to the Herring FMP was part of an omnibus amendment developed by NMFS to ensure that all FMPs of the Northeast Region comply with the Standardized Bycatch Reporting Methodology (SBRM) requirements of the MSA. Amendment 3 to the Herring FMP is currently under development by the Council and represents an omnibus amendment to all Council FMPs to address Essential Fish Habitat (EFH) consistent with the MSA. Amendment 4 implemented a process for establishing annual catch limits and accountability measures in the herring fishery and brought the Herring FMP into compliance with the recently reauthorized MSA.

Amendment 4 included management measures to:

- Establish annual catch limits (ACLs) in the fishery, a measure which consists of four components:
    - Define terms which would bring the Atlantic Herring FMP into compliance with the MSA, which included setting an interim ABC control rule;
    - Eliminate Joint Venture Processing (JVP), Internal Waters Processing (IWP), Total Allowable Level of Foreign Fishing (TALFF) and Reserve specifications from the process (the council decided upon this sub-option as opposed to the status quo sub-option which would have retained JVP, IWP, TALFF and Reserve in the specifications process);
    - Establish the possibility of sub-ACLs in the fishery, along with possible corresponding AMs or other sub-ACL measures; and
    - Establish the Atlantic Herring Fishery Specification Process which utilizes the elements being established within Amendment 4;
- Establish accountability measures (AMs) for the herring fishery:
    - Institute the current management measures, which close the fishery when 95% of the sub-ACL is projected to be reached, as an AM;
    - Create a consequential AM that can apply to ACLs or sub-ACLs for overages by subtracting the amount of the overage from subsequent ACLs; and
    - Create a haddock catch cap which complies with current management.

1.3 NOTICE OF INTENT AND SCOPING PROCESS

The New England Fishery Management Council published a Notice of Intent (NOI) to announce its intent to develop this amendment (Amendment 4 at the time) and prepare an EIS to analyze the impacts of the proposed management alternatives on May 8, 2008. A second, Supplementary NOI was published on December 28, 2009 to announce the intent to prepare an EA for Amendment 4 and EIS for Amendment 5, after the two amendments were split. The purpose of both of the NOIs was to alert the interested public to the commencement of the scoping process and to provide for public participation in the development of this amendment, consistent with the requirements of 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 impacts to the extent practicable. The scoping process is the first and best opportunity for members of the public to raise issues and concerns for the Council to consider during the development of an amendment. The Council relies on public input during the scoping process both to identify management issues and develop alternatives that meet the Herring FMP objectives. Public comments early in the amendment development process help the Council to address issues of concern in a thorough and appropriate manner.

A scoping document was prepared and distributed to inform the public of the Council's intent to gather information necessary for the preparation of Amendment 4 and ask for suggestions and information on the range of issues to be addressed in this amendment. During the scoping period for Amendment 4 (May 8 – June 30, 2008), four scoping meetings were conducted, and numerous written comments were received. Comments received during the scoping process were considered carefully by the Council when developing the management alternatives under consideration in this amendment.

The measures proposed in this amendment were originally developed as part of Amendment 4 to the Atlantic Herring FMP, but Amendment 4 was split in June 2009 so that the Council could develop annual catch limits (ACLs) and accountability measures (AMs) for implementation for the 2011 fishing year (as mandated by the MSA). The ACL/AM component was designated to be part of Amendment 4, and other measures under consideration (catch monitoring program, river herring bycatch measures, criteria for midwater trawl access to groundfish closed areas, measures to address interactions with the Atlantic mackerel fishery) required additional work/discussion and was developed for this amendment.

The Herring Committee, Advisory Panel, and Plan Development Team considered all the scoping comments during the development of the range of alternatives in this amendment. The major issues that were identified and discussed during the scoping process for the Amendment 5 EIS are generally summarized below. This summary is not intended to reflect every comment that was received, and the letters and scoping meeting summaries should be referenced to gain a better perspective on individual comments, ideas and suggestions.

1.3.1 General Scoping Comments

- It was suggested that the regulations for the vessel monitoring system (VMS) system were antiquated and duplicative with the call-in and interactive voice response (IVR) system. Complications with the system and the observer program were also mentioned. Likewise, difficulties with the IVR system were brought forward. It was asked that these issues be addressed to make the reporting system simpler.
- One issue that also arose was dealer reporting. It was suggested that species identification and reporting requirements for dealers be improved so that the information gathered could be more consistent.

1.3.2 Comments About Bycatch

- Many interested parties felt that the midwater trawl sector of the Atlantic herring fleet was more detrimental to stocks in the ocean than had been previously observed. Bycatch was a primary concern, and many felt that the observer coverage at the time did not adequately detect it. Some who commented felt that the protocols utilized by observers were not adequate to capture what was occurring in the fishery. Some felt that punitive measures should be taken to avoid bycatch in the fishery. Others felt that higher observer coverage would provide more data to better understand herring and their role in the ecosystem (as a forage fish), which was a significant concern for many parties.
- A few interested parties suggested that observation of the fishery could benefit from video monitoring (cameras) and newer technology, as well as scales. A few other parties felt that maximized retention should become an alternative in the document, which would allow for a full sampling of bycatch in the fishery. Several commenters suggested that a more robust dockside monitoring program would be beneficial.

1.3.3 Comments About River Herring (Alewife and Blueback Herring)

- There was concern from several interested parties that bycatch of river herring by the Atlantic herring fleet was high. Some suggested that higher monitoring would allow for better estimates of the amount of river herring being caught. Others felt that more restrictive measures should be taken in the herring fishery.
- Some also requested that the Council consider spatial restrictions such as “safe zones”, in which the Atlantic herring fleet would not be able to operate. Although many issues were mentioned with regard to degraded habitat in coastal areas and inland, most were in reference to how those issues are being addressed. The greatest concern for the decline in river herring populations was believed by many to be occurring during the ocean stage of the river herring’s life.

1.3.4 Comments about Interactions with the Atlantic Mackerel Fishery

- The overlap of the herring and mackerel fisheries and the potential for bycatch of these species to occur in the fisheries was raised as an issue during scoping by some parties. More specifically, one concern expressed was regarding mackerel vessels that did not qualify for a herring limited access

permit and may be restricted by a low herring trip limit when fishing for mackerel. Although an open access incidental catch permit exists, the limit is such that it may be restrictive for mackerel fishing. It was suggested that increasing the limit would benefit both fisheries.

1.3.5 Comments About the Multispecies (Groundfish) Fishery

- Some individuals mentioned the need to protect stocks in the groundfish fishery from herring trawlers, such as haddock. A few mentioned the particular need to protect juvenile and spawning fish. Buffer zones and closed areas were suggested approaches to consider.

1.3.6 Comments About Social and Community Impacts

The following is a general discussion of the social and community impacts related to Amendment 5 to the Herring FMP. These impacts are discussed from the industry/community perspective, as well as the perspective of other affected stakeholders.

Herring Fishery-Related Businesses and Communities

For midwater and pair trawl vessels, reduced sub-ACLs (quotas) for Atlantic herring, combined with the summertime ban on midwater trawling in Area 1A and the haddock catch cap on Georges Bank led to 2010 being one of the worst herring fishing years since 1986. ASMFC regulations that limited landing days further exacerbated the losses. Purse seine vessels, that are permitted to fish in Area 1A in the summer, appear to also have had a poor fishing year in 2010. Some observers said that the impacts on the seiners came largely from fish behavior since herring was "tight to the bottom" which makes them more inaccessible to the purse seiners. Other observers argue that too much herring is caught by the trawlers, thereby limiting the amount of herring resident or moving through Area 1A.

Another effect of the lowering the sub-ACLs was that the Connor Brothers, the owner of the only remaining sardine cannery in the Northeast (Prospect Harbor, ME), could argue that they should be permitted to close due to lack of herring, despite an agreement with the State of Maine to keep the plant open and buying herring for a specified number of years after its purchase from Stinson Seafoods.

Higher fuel costs also increased the impact of regulatory changes in herring management. Herring processing plants with their associated midwater and pair trawl vessels depend on mackerel to bolster their income, but in some years mackerel moves farther offshore and/or is harder to locate. With fewer vessels "searching" because of the high fuel costs and the regulations, mackerel did not provide the necessary supplement in 2010. Two of the major herring processing plants in New Bedford and Gloucester have been struggling to stay viable. One of the plants has lost its vessels and, according to a company representative, the other has at least one of its dedicated vessels up for sale.

Larger vessels may also have certain disadvantages relative to smaller vessels in coping with lower quotas and restricted landing days. According to representatives of the companies that own or lease several of these multimillion-dollar vessels, they do not believe that their business is sustainable when they are limited to one or two landing days per week. Consequently, even the larger purse seines that are allowed to fish in Area 1 A in the summer have been forced to move offshore. Fishing in Area 3, however, takes a 12 to 16 hour steam with the concomitant high cost of fuel. In contrast, the smaller purse seines fish only three or four hours from their dock.

Furthermore, the cap on haddock bycatch was set based on a calculation of uncertainty that envisioned limited observer coverage, and was not adjusted when the uncertainty was lessened due to increased observer coverage. As a result, vessels tried to avoid fishing on Georges Bank (Area 3), for fear of encountering haddock and prematurely closing the entire herring fishery. Neither the catch cap for haddock nor the Area 3 sub-ACL for herring was taken in 2010. The Council addressed this issue during 2011 through Framework 46 to the Multispecies FMP by specifying a haddock bycatch cap adjustment based on the expected observer coverage for each haddock stock.

The market for herring used as lobster bait generally extends from May to November, though August and September are usually the busiest months. The summer restriction on Area 1A to fixed gear and purse seines is said to have led to a significant increase in the price of herring for bait, potentially a major impact on the lobster fishery.

Herring boats that are not associated with a particular plant need a winter market, since lobster fishing is rarely active in the winter. If the processing plants in New Bedford and Gloucester close, only Lund's in Cape May, New Jersey and the Canadian canneries would likely remain as buyers of winter herring from independent vessels.

With lower landings and higher fuel costs, fewer herring-dependent companies have been able to retain full-time representatives to speak on their behalf at NEFMC meetings or other regulatory venues. In contrast, environmental organizations have continued to provide funding to representatives who are opposed to midwater and pair trawling for herring. These organizations are more supportive of weirs (fixed gear) or purse seines than trawls because they believe these are more ecologically friendly (Ruais 2006; Pew Environmental Group, 2008).

Effects on specific processors and/or dealers depend in part on what alternative fisheries or products are available to the company. Mackerel and/or squid, for example, may be processed in the same plants as herring. Although the facilities in New Bedford and Gloucester do process mackerel when available, they are not as diversified as Lund's in New Jersey. Lund’s benefits from their ability to handle diverse species.

Similarly, herring closures triggered by bycatch, for example, affect individual fishing businesses differently. Some vessels have permits to catch a variety of species; because they are not solely dependent on herring they can switch to another species when herring is closed if the species are in the same region. However, this is a less viable option for vessels with permits and quota for species in distant regions (e.g., Bering Sea pollock).

Interviews with participants in the fishery suggest that regulations have affected herring markets; led to decreased revenues from the fishery; decreased participants' sense of well-being; and reduced some participants' children's options to continue family participation in fishing. Lower revenues (after costs) may also affect safety since companies may postpone vessel maintenance. As noted in Figure 71, the total ex-vessel value of herring sold by federally permitted dealers in 2010 showed a 22% decrease in revenues from 2009.

Other Herring-Related Businesses

While the lobster industry relies on the availability of herring for bait in their lobster traps, commercial tuna fishermen and charter boat businesses rely on the availability of herring as forage for their target species. In addition, groundfishermen point to the need for sufficient herring to form egg beds that may be critical to the development of haddock as well as quantities of juvenile herring that serve as prey to a host of other groundfish. Consequently, these stakeholders are affected indirectly, though no less

seriously, by herring management. The social and economic impacts, however, are a result of what these businesses regard as insufficient controls on herring fishing rather than what the directed herring fishery considers "overly-precautionary" restrictions on their industry.

Scientific models used to determine if fish populations are being overfished incorporate estimates of the portion of a population that serves as prey. Even with the estimates of mortality due to forage, herring is not considered overfished, however, the literature suggests that local or traditional ecological knowledge (LEK or TEK) may identify patterns missed by science (Breton-Honeyman et.al. 2010; Thornton et al. 2010). Consequently, the issues raised by herring-related businesses is appropriate to consider when weighing the socio-economic impacts of herring management.

The CHOIR Coalition was formed in 2002 by commercial and recreational fishermen concerned about the increased use of midwater and pair trawling for herring in inshore areas as well as a lack of monitoring (CHOIR Coalition 2011). The Coalition has grown to include ecotourism businesses, a variety of researchers, and environmental conservation groups. Another, separate organization focused on herring is The Herring Alliance, a group of environmental organizations that formed in 2007 with members from Maine to Virginia.

CHOIR is a diverse group that includes members from Maine to Connecticut, so many of the communities described in the "Communities" section could be considered impacted by herring fisheries management from this perspective. Some of these communities are representative of the dual impacts of the management plan. For example, Gloucester is home to Cape Seafoods (see profile under "Processors"), lobster fishing vessels, several ecotourism businesses (including whalewatch vessels), charter boat businesses, recreational fishermen, groundfishermen and commercial tuna boat fisheries. Impacts may therefore be attributed to either tighter controls on the herring fishery that could threaten the viability of the herring plant and cause higher prices for bait for the lobstermen (because too few herring are landed), or looser controls on herring that could negatively impact the businesses that rely on herring for forage to attract their species of interest (because too many herring are allowed to be caught). Achieving a balance is a major challenge.

One concern voiced by CHIOR is that if the midwater and pair trawl operations catch something other than herring, while the volume maybe low based on a percentage of their catch, the total numbers can be large. This is a particularly sensitive issue for groundfishermen who are not allowed to fish in certain closed areas in order for the groundfish stocks to rebuild, while the herring vessels can fish in these areas. If the herring vessels are catching juvenile groundfish, their recovery will be slowed, thus impacting the groundfishermen.

Related to the concerns about catches of non-targeted species is the herring industry's practice of releasing catches or dumping. This can occur when there are mechanical problems or when, for example, a pump is blocked by dogfish, but it also may occur when the herring fishermen find that the herring they have caught is too small, too "feedy" or otherwise unsellable. With the increase in monitoring, dumping/releasing events have decreased, so these herring-related businesses consider this a benefit of the increased controls.

Measuring the effect of increased herring fishing on these other businesses is hampered by a lack of quantitative data. The stock assessments and scientific research, for example, do not demonstrate such phenomena as "localized depletion," that these businesses say they have observed. Though localized depletion per se has not been scientifically demonstrated, there are several studies that identify localized stocks and the potential problems (e.g., loss of subpopulations) that can arise if management fails to manage at correct spatial scales (Fogarty and Myers 1998; Smedbol and Stephenson 2001, Ames 2004). Nevertheless, numerous accounts suggest that there is at least a perceived effect of herring fishing on the

availability of forage for other species. In the 1990s, the tuna fishing industry showed graphically that as herring catches associated with midwater trawling increased, the success rate of general category permitted bluefin tuna fishing decreased (Ruais 2011). (See graph in Herring Alliance 2009:12).

While this analysis has not been replicated lately, some of the businesses have noted benefits of the adoption of controls on the herring fishery. For example, Amendment 1 to the Herring FMP that restricted Area 1A to fixed gear and purse seine only in the summer has reportedly resulted in benefits to the various members of the Coalition. (Several representatives of the group noted that they had coexisted with purse seine herring fishermen for many years.) Bluefin landings have reportedly increased since 2009. Nevertheless, the summer closure of the inshore area is not considered sufficient. In particular, the access of the midwater/pair trawlers to Area 1A in October and November is believed to disrupt nascent spawning aggregations of herring and may interfere with rebuilding inshore herring stocks.

Coalition members also note that the bluefin are moving to Canadian waters where midwater trawling is not allowed. Drawing the inference that more herring is available, so the bluefin are attracted to Canada, members suggest that their presence in Canadian waters (and thus availability of bluefin tuna to the Canadian fisheries) has radically increased. This view is supported by the Report of the 2010 Atlantic Bluefin Tuna Stock Assessment Session that includes graphs that compare trends in the indices of abundance for western bluefin tuna by area fished. The graph for Canada's Gulf of St. Lawrence shows a significant relative increase (ICCAT 2010:61).

Like the U.S., Canada has a quota agreed upon internationally through the International Commission to Conserve Atlantic Tuna or ICCAT. A summary of landings in Canada by Neilson et al. 2011 shows a fairly stable quantity of landings from 2002 to 2008, with the exception of a significant increase in 2006. CBS News-Canada reported that both Prince Edward Island (PEI) and Nova Scotia tuna fishermen caught their quota in two days in 2010, leading to the PEI imposing stringent regulations to slow down their landings in 2011 (CBS News, 2010).

According to Fisheries and Oceans Canada's Atlantic Bluefin Tuna management plan (effective 2007), "bluefin tuna are at the northern edge of their range in Canada and often show unpredictable and changeable distribution. This, combined with their schooling behavior, the patchiness of their prey, and age-specific preference for waters of particular temperatures associated with annual variability in hydrographic/oceanographic conditions, accounts for the considerable year-to-year variation in fishing location." However, conditions in 2010 and 2011, possibly including prey availability, have clearly succeeded in attracting the bluefin tuna to Canada.

Increased monitoring (observer coverage) and catch sampling in 2010 of the commercial midwater and trawl herring vessels was also considered a benefit by the coalition, although representatives of the group suggest that greater coverage, especially 100 percent coverage, would ensure that the midwater and pair trawlers are neither catching juvenile groundfish or other non-targeted species in their small mesh nets nor dumping/releasing unsampled catch.

Observer reports under the increased coverage in 2011 suggest that the midwater and pair trawl operations can avoid catching and dumping non-targeted species. What the representatives of the other businesses say, however, is that they are concerned that this avoidance is a result of an observer effect, i.e., if there were no observer on board (or alternative monitoring) that the catch would not be so clean.

The members of the Coalition and the Herring Alliance both refer to the cumulative impact of over a decade of midwater and pair trawling on herring as having negative impacts on the quantity of herring needed for forage, especially as groundfish stocks begin to rebound. Further, they criticize the overreliance on inshore areas that concentrates fishing effort in vulnerable areas important to small

fishing operations. Finally, they express concern about the bycatch of herring fishing that includes endangered river herring, as well as marine mammals and other protected species. In summary, the impacts affect the businesses that depend on herring to attract the species that they fish or watch.

1.4 PURPOSE AND NEED FOR ACTION

The need for this action arose shortly after the development of Amendment 1 to the Herring FMP, which included a limited access program for the herring fishery and established a seasonal purse seine/fixed gear area in the inshore Gulf of Maine, along with implementing other measures to address the long-term management of the fishery. Since the implementation of Amendments 1, 2, and 4, concerns about the fishery have led the Council to determine that additional action is warranted to further address issues related to the long-term health of the herring resource, how the resource is harvested, how catch/bycatch in the fishery are accounted for, and the important role of herring as a forage fish in the Northeast region. These concerns are reflected in the unprecedented level of interest in managing this fishery by New England's commercial and recreational fishermen, eco-tourism and shoreside businesses, and the general public.

The primary purpose of this amendment, therefore, is to improve catch monitoring and ensure compliance with the MSA. One purpose of the amendment is to implement measures to improve the long term monitoring of catch in the herring fishery. Additionally, a purpose of this amendment is to specifically address river herring bycatch, while ensuring that the amendment is consistent with the provisions of the MSA, including the National Standard to minimize bycatch and bycatch mortality to the extent practicable.

The purposes and needs for this amendment are expected to advance the goals and objectives of the herring management program identified in Section 2.0 of this document. The proposed management action is intended to achieve both the goals and objectives of the management program and the specific goals and objectives of the catch monitoring program (identified in Section 2.1.3), in addition to the primary purposes of this action (Table 1).

Table 1 Purpose and Need for Amendment 5

Need for Amendment 5	Corresponding Purposes of Amendment 5
Address long term health of the herring resource, including how herring is harvested in order to sustain the important biologic role of herring as a forage fish in the Northeast Atlantic	To improve long term catch monitoring and to ensure better compliance with the provisions of the MSA
Improve how catch and bycatch from the herring fishery are accounted for	Better monitor bycatch in the herring fishery, including specifically monitoring river herring bycatch, and to ensure that the FMP is consistent with the bycatch provisions of the MSA

2.0 GOALS AND OBJECTIVES

2.1.1 Background – Goals and Objectives for the Herring Fishery Management Program

The goals and objectives of the Atlantic herring fishery management program were specified in Amendment 1 to the Herring FMP and will continue to frame the long-term management of the resource and fishery:

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:

1. Harvest the Atlantic herring resource consistent with the definition of overfishing contained in the Herring FMP and prevent overfishing.

2. Prevent the overfishing of discrete spawning components of Atlantic herring.

3. Avoid patterns of fishing mortality by age which adversely affect the age structure of the stock.

4. Provide for the orderly development of the herring fishery in inshore and offshore areas, taking into account the viability of current and historical participants in the fishery.

5. 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.

6. Prevent excess capacity in the harvesting sector.

7. Minimize, to the extent practicable, the race to fish for Atlantic herring in all management areas.

8. Provide, to the extent practicable, controlled opportunities for fishermen and vessels in other Mid-Atlantic and New England fisheries.

9. 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.

10. Promote compatible U.S. and Canadian management of the shared stocks of herring.

11. 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.

2.1.2 Goals and Objectives of Amendment 5 to the Atlantic Herring FMP

At this time, it is intended that the management measures proposed in this amendment will address one or more of the following:

GOAL

To develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA)

OBJECTIVES

I. To implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;

II. To implement other management measures as necessary to ensure compliance with the MSA;

III. To implement management measures to address bycatch in the Atlantic herring fishery;

IV. In the context of Objectives I-III (above), to consider the health of the herring resource and the important role of herring as a forage fish and a predator fish throughout its range.

2.1.3 Goals and Objectives of the Amendment 5 Catch Monitoring Program

The Council has identified ***catch monitoring*** as a primary management issue for consideration in Amendment 5 and approved a specific set of goals and objectives for the catch monitoring program. A catch monitoring program for the Atlantic herring fishery that supplements and improves the existing program can take on many forms and include several different approaches. At-sea monitoring should focus on both total catch and bycatch– maximizing the sampling of everything that enters the net and is either pumped aboard the fishing vessel or discarded at sea. Another important element of catch monitoring is improving reporting and ensuring real-time monitoring of the management area sub-ACLs for the Atlantic herring fishery. A thorough understanding of the strengths and weaknesses of the existing catch monitoring program is a fundamental first step towards designing a new and better program. This was the focus of the Herring Committee and Advisory Panel's discussions during and since the initiation of Amendment 5. The existing catch monitoring program is described in detail and evaluated to the extent possible as part of the description and discussion of the no action alternative in this document.

In general, the goals (numbered) and objectives (bulleted) of the catch monitoring program established in Amendment 5 are:

1. To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species caught in the herring fishery;

- Review federal notification and reporting requirements for the herring fishery to clarify, streamline, and simplify protocols;

2. Develop a program providing catch of herring and bycatch species that will foster support by the herring industry and others concerned about accurate accounts of catch and bycatch, i.e., a well-designed, credible program;

- Avoid prohibitive and unrealistic demands and requirements for those involved in the fishery, i.e., processors and fishermen using single and paired midwater trawls, bottom trawls, purse seines, weirs, stop seines, and any other gear capable of directing on herring;

- Improve communication and collaboration with herring vessels and processors to promote constructive dialogue, trust, better understanding of bycatch issues, and ways to reduce discards;

- Eliminate reliance on self-reported catch estimates;

3. Design a robust program for adaptive management decisions;

4. Determine if at-sea sampling provides bycatch estimates similar to dockside monitoring estimates;

- Assure at-sea sampling of at-sea processors' catches is at least equal to shoreside sampling;

- Reconcile differences in federal and states' protocols for dockside sampling, and implement consistent dockside protocols to increase sample size and enhance trip sampling resolution.

3.0 PROPOSED MANAGEMENT ACTION AND OTHER ALTERNATIVES CONSIDERED

The management alternatives/options proposed by the Council in Amendment 5 can be grouped into four major "categories": (1) Adjustments to the Fishery Management Program; (2) Measures to Address Catch Monitoring At-Sea; (3) Management Measures to Address River Herring Bycatch; and (4) Management Measures to Address Midwater Trawl Access to Groundfish Closed Areas.

The Council selected preferred alternatives for Amendment 5 at its June 19-21, 2012 meeting in Portland, ME. The Council's rationale for selecting the preferred alternatives is provided in the discussion below the proposed measure. Non-preferred alternatives are also described in the following sub-sections. The entire proposed action for Amendment 5 is summarized in the Executive Summary of this document and identified throughout the following sub-sections as the ***Preferred Alternative*** within the suite of alternatives/options that were proposed by the Council for action. Management measures considered but rejected by the Council during the development of Amendment 5 are described in Section 4.0 of this document.

The MSA defines "bycatch" as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidental catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. Due to the high-volume nature of the Atlantic herring fishery, certain species, including river herring, shad, and some groundfish, may be either discarded or retained and/or sold when harvested during the Atlantic herring fishery. Therefore, for the purpose of this document, the terms "bycatch" and "incidental catch" are sometimes used interchangeably, and measures to "minimize bycatch to the extent practicable" refers to catch of species that may be both bycatch and incidental catch.

The data provided in this document indicate that the majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch (discards). However, as noted, some non-targeted catch that is landed incidentally is not separated and identified as such; this is particularly true with species like river herring and shad, other alosine pelagic fish that look very similar to Atlantic herring. The Council recognizes the need to minimize all catch of river herring in the Atlantic herring fishery, bycatch and incidental, and the management measures proposed in this document are intended to do so. Addressing river herring bycatch in the herring fishery includes both minimizing bycatch at-sea to the extent practicable, consistent with the MSA definition of bycatch, and minimizing the landing of river herring as incidental catch in the herring fishery. Measures to address catch monitoring at-sea (Section 3.2) are focused on minimizing bycatch to the extent practicable by increasing observer coverage and addressing net slippage. Measures to address river herring bycatch (Section 3.3) focus on both at-sea bycatch reduction (through monitoring and avoidance) and minimization of river herring incidental catch through portside sampling (as part of the SMAST/SFC program) and measures to adjust the herring fishery management program (Section 3.1).

For the purposes of this document, the term *river herring* is used to refer to alewife and blueback herring, and the term *shad* is used to refer to the species of American shad and hickory shad.

3.1 ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM

3.1.1 Regulatory Definitions (Transfer at Sea and Offload)

A. No Action Option

If no action is taken regarding this measure, no new regulatory definitions would be established in Amendment 5 for the Atlantic herring fishery (although some existing definitions may be revised to reflect consistency with other measures in this amendment).

B. Proposed Regulatory Definitions (Preferred Alternative)

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Under this option, Amendment 5 would establish a regulatory definition of *transfer at sea* and a regulatory definition of *offload* for the purposes of the Atlantic herring fishery to clarify provisions related to each vessel engaged in transfer operations and to clarify reporting provisions.

This measure would define a herring transfer at sea as: *a transfer from an Atlantic herring vessel (i.e. in the vessel hold or on deck), codend, purse seine to another vessel for personal use as bait, to an Atlantic herring carrier or at-sea processor, or to another permitted herring vessel. Two vessels hauling one codend is pair trawling and is not considered a transfer at sea.*

This measure would also modify the definition of *offload* to add the following:

For the purposes of the Atlantic herring fishery, an offload or offloading means to remove, begin to remove, to pass over the rail, or otherwise take fish away from any vessel for sale to either a permitted At-sea Atlantic Herring dealer (as defined in the options proposed in Section 3.1.3.2 of this document) or a permitted land-based Atlantic herring dealer.

Rationale: Establishing a catch monitoring program for the Atlantic herring fishery in Amendment 5 provided the Council with an opportunity to review and consider modifying/clarifying existing regulatory definitions and current permit/reporting provisions as they pertain to reporting Atlantic herring fishing activity. The Council began considering new regulatory definitions early in the Amendment 5 process (2009). Defining the terms, "transfer at sea," and "offload," would help improve reporting compliance, ensure accuracy and completeness of data, and improve consistency between databases because it should lessen the chance of misallocating or double counting herring catches. The proposed definitions relate to the overall goal of the amendment, which is to improve catch monitoring and ensure compliance with the MSA. They also relate indirectly to the first objective, which is to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. Clarifying regulatory definitions may further reduce any ambiguity related to the ***Preferred Alternative*** selected in Section 3.1.3 (Measures to Address Carrier Vessels) and any other relevant management measures, which, in turn, may reduce the likelihood for misallocating or double counting herring catches.

3.1.2 Administrative/General Provisions

Some administrative/general provisions are proposed in Amendment 5 to address provisions related to fishing operations involving multiple vessels, as well as vessel monitoring system (VMS) and vessel trip report (VTR) requirements. The goal of the proposed administrative/general provisions is to create a cost-effective and administratively-feasible management program to develop accurate and timely records of catch of all species caught in the Atlantic herring fishery and to enhance catch monitoring and ensure that management is timely, efficient, and adaptive. The provisions that are proposed in Amendment 5 were adopted by the Council at its June 2012 meeting, with a clarification that the proposed at-sea dealer permit is intended to apply to carrier vessels that sell herring at-sea.

A. No Action Option

Under the no action option, no changes would be made to the current provisions regarding vessels working cooperatively in herring fishing operations, VMS provisions, or reporting through vessel trip reports (VTRs).

The regulations at §648.204(b) state that both vessels involved in a pair trawl operation must be issued the herring permit appropriate for the amount of herring jointly possessed by both of the vessels participating in the pair trawl operation. This means that the more restrictive possession limit of the vessels participating in a pair trawl operation is the limit of the total amount of herring that the vessels may jointly fish for, possess, or land in any calendar day. For example, if Vessel 1 has a Category A permit, which has no possession limit, and Vessel 2 has a Category C permit, with a possession limit of 55,000 lbs./day, then the vessels are only permitted to jointly fish for, possess, and land 55,000 lbs./day. Under this option, no changes would be made to the current restrictions on vessels working cooperatively in the Atlantic herring fishery.

If no action is taken, the current VMS "power down" provision would not be eliminated for limited access herring vessels. Limited access herring vessels would be able to continue turning off their VMS units when in port according to the regulations at §648.10(c)(2).

B. Proposed Administrative/General Provisions (Preferred Alternative)

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Under this option, the following additional provisions would be implemented in Amendment 5 to modify some of the FMP's administrative/general provisions:

2A. Expand Possession Restrictions to All Vessels Working Cooperatively in the Atlantic Herring Fishery (to Include Purse Seine Vessels and Vessels that Transfer Herring At-Sea)

This measure would expand the provisions §648.204(b) to include paired purse seine operations and transfers at sea between vessels. In summary, all vessels working cooperatively in the herring fishery are subject to the most restrictive possession limit associated with any of the vessels.

2B. Eliminate the VMS "Power Down" Provision for Limited Access Herring Vessels

Under this option, Amendment 5 would include a measure that would prohibit limited access herring vessels (and carrier vessels that utilize VMS) from turning off their VMS units when in port unless specifically authorized by NMFS through a Letter of Exemption, consistent with VMS provisions for the multispecies, scallop, and surf clam/ocean quahog fleet:

- The Northeast Fisheries Regulations allow vessels holding certain permits to turn off their VMS units during periods when the vessel will be out of the water or during extended periods of no fishing activity. The request must be made in advance of the intended exemption period, and a "Letter of Exemption" (LOE) must be issued by NMFS. Vessels may not turn VMS units off until they receive a LOE approval from NMFS.
- **All Vessels.** May request a Letter of Exemption from NMFS if the vessel is expected to be out of the water for more than 72 consecutive hours.
- **Limited Access Multispecies, Limited Access Scallop and Surfclam/Ocean Quahog Vessels (Proposed to Add Limited Access Herring Vessels).** May sign out of the VMS program for a minimum of 30 consecutive days by obtaining a Letter of Exemption from NMFS. The vessel may not engage in any fisheries until the VMS unit is turned back on.

2C. Establish a New At-Sea Herring Dealer Permit

Under this option, Amendment 5 would establish a new Federal At-Sea Herring Dealer permit that would be required for carrier vessels that receive herring other than only for transport at sea, or other vessels that sell Atlantic herring to any entity.

- The definition of "Atlantic Herring Dealer" in Section 648.2 (Definitions) would be modified to include carrier vessels that may sell fish.
- This permit would require compliance with federal dealer reporting requirements (Section 648.7) at any time the vessel is in possession of the at-sea dealer permit. A "dealer identifier" would have to be developed for at-sea for the purposes of reporting. Vessels that have both the At-Sea Herring Dealer Permit and a herring fishing permit would be required to fulfill the reporting requirements of both permits while in possession of both permits.

Rationale: The ***Preferred Alternative*** is intended, in part, to reduce the likelihood for errors reporting, and consequently, in the calculation of catch statistics. The administrative/general provisions proposed in Amendment 5 relate to the overall goal of the amendment, which is to improve catch monitoring and ensure compliance with the MSA; each proposed provision is discussed briefly below. The ***Preferred Alternative*** also relates indirectly to the first objective, which is to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery (to the extent that they clarify regulations and are intended to improve compliance/enforcement – see below).

- Clarify that vessels working cooperatively in a multi-vessel operation are limited to the vessels' most restrictive possession limit – this measure was proposed by NMFS for consideration in Amendment 5 and may improve enforcement of herring possession limits in multi-vessel operations;
- Eliminate the VMS power down provision for limited access herring vessels – This provision is proposed for consistency across limited access management programs in the Northeast Region, and to improve the enforceability of catch monitoring in the herring fishery. The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At that time, the Enforcement Committee agreed by consensus to support eliminating the VMS power down provision because it would make provisions for herring limited access vessels consistent with other limited access vessels and would enhance enforcement of the herring regulations.
- Establish a new At-Sea Herring Dealer Permit – establishing this permit may reduce any ambiguity related to the ***Preferred Alternative*** in Section 3.1.3 (Measures to Address Carrier Vessels) and improve reporting of herring catch by dealers and carrier vessels. It may reduce instances where catch is mistakenly attributed to a carrier vessel on a dealer report and then cannot be matched to a vessel trip report (VTR). During final decision making (June 2012 Council meeting), the Council clarified that this permit is intended to apply to carrier vessels that sell herring at-sea, to address some confusion about whether the provisions would apply to vessels that sell small amounts of herring at sea for personal use/bait.

3.1.3 Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea

The Council considered several options in this amendment to address herring carrier activity (reporting) and the transfer of Atlantic herring at-sea. The Council's ***Preferred Alternatives*** and other options considered are described in the following subsections.

3.1.3.1 Background

The Letters of Authorization (LOAs) issued by NMFS for the Atlantic herring fishery currently allow herring, consistent with applicable possession limits, to be transferred at-sea (a) from herring catcher vessels to carriers; (b) between federally permitted herring vessels; and (c) from herring catcher vessels to non-permitted vessels for personal use as bait (see Table 2, which summarizes all of the LOAs available to vessels participating in the herring fishery).

Table 2 Summary of Current Letters of Authorization for the Atlantic Herring Fishery

LOA	Who	Provisions
Transfer at Sea	Any permitted herring vessels wishing to transfer herring at sea	• Enrollment duration: Permit year • Transfer, within the transferring vessel's permitted possession limits, to vessels not issued an Atlantic herring permit for personal use as bait, provided that the vessel does not have purse seine, midwater trawl, pelagic gillnet, sink gillnet, or bottom trawl gear aboard; • Transfer, within the transferring vessel's permitted possession limits, to vessels issued an Atlantic herring carrier LOA, or to permitted at-sea processors; • Transfer, within the transferring vessel's permitted possession limits, to another permitted herring vessel
Carrier	Any permitted herring vessels wishing to transport herring from catcher vessels to land-based dealers	• Enrollment period: Minimum 7 days • Receive, transport, and transfer Atlantic herring caught by another vessel. • No gear allowed on board • All reporting requirements associated with carrier's permit apply
Midwater Trawl	Any permitted herring vessels wishing to fish with midwater trawl gear in the Gulf of Maine (GOM)/Georges Bank (GB) Regulated Mesh Area (RMA)	• Enrollment period: Minimum 7 days • Vessel may fish with midwater trawl gear in GOM/GB RMA, including Closed Area I, Closed Area II, and Nantucket Lightship Closed Area, with nets less than the minimum mesh size at §648.80(a)(3)(ii). • Can retain Atlantic herring, blueback, and mackerel north of 42-20 and in closed areas (multispecies possession restrictions apply); can retain Atlantic herring, blueback, mackerel, and squid south of 42-20 • All notification and reporting requirements associated with vessel's permit apply
Purse Seine	Any permitted herring vessels wishing to fish with purse seine gear in the GOM/GB RMA	• Enrollment period: Minimum 7 days • Vessel may fish with purse seine gear in GOM/GB RMA, including Closed Area I, Closed Area II, and Nantucket Lightship Closed Area, with nets less than the minimum mesh size at §648.80(a)(3)(ii). • Can retain Atlantic herring, blueback, mackerel, and menhaden (multispecies possession restrictions apply) • All notification and reporting requirements associated with vessel's permit apply

3.1.3.2 Measures to Address Carrier Vessels

In Amendment 5, reporting provisions will be modified to clarify that herring carrier vessels are required to report a NMFS-specified trip identifier (for example, VTR serial number) to the dealer receiving the offload. Carrier vessels acting as dealers would be required to report the NMFS-specified trip identifier from the catcher vessels in their dealer reports. This clarification is intended to improve the reporting of herring transferred at-sea.

Amendment 5 also will eliminate the VTR reporting requirement for herring carrier vessels when they are engaged in carrying activities. Currently, carrier vessels are required to submit VTRs to NMFS, which indicate 'no catch' for the days during which they were carrying and the vessel name and permit number of the catcher vessel for which they were carrying fish. All catch is to be reported by and attributed to the vessels harvesting the catch. Eliminating the VTR reporting requirement is intended to help prevent the double counting of landings that may occur if a dealer mistakenly attributes the landings to the carrier vessel and not the harvesting vessel.

In addition to the above clarifications to existing provisions for Atlantic herring carrier vessels, the Council considered options to provide carrier vessels with more flexibility that the current Letter of Authorization (LOA) for carrying herring currently allows. These options are described in the following subsections. The Council's ***Preferred Alternative*** is Option 3.

3.1.3.2.1 Option 1: No Action (Status Quo for Carrier Vessels)

If the no action option is selected, no additional requirements/provisions for herring carrier vessels would be implemented in Amendment 5 (with the exception of the two provisions/clarifications described in the introductory section above).

Vessels acting as Atlantic herring carriers are required to have a valid Letter of Authorization (LOA) from the Regional Administrator and are not required to report catch via the IVR/VMS reporting system implemented by NMFS in 2011. When herring is transferred to another vessel, the vessel that catches the fish (the catcher vessel) is required to report the catch via the VMS system if it possesses a limited access permit or through the IVR system if it possesses an open access permit (the carrier should not report catch to minimize double counting). Under the no action alternative, the carrier vessel is required to submit a VTR but note that the vessel is carrying and there was no catch.

3.1.3.2.2 Option 2: Require VMS on Carrier Vessels for Declaration Purposes and Eliminate Seven-Day LOA Enrollment Restriction

In addition, under this option, vessels that want to act as Atlantic herring carriers could obtain a LOA from NMFS to do so for the entire fishing year, but they would also be required to utilize a vessel monitoring system (VMS) and comply with the VMS provisions for limited access herring vessels. Carrier vessels would be required to use their VMS pre-trip declaration to indicate whether or not they will be engaged in herring carrying activity.

Because carrier vessels would be required to utilize VMS for trip declaration purposes, this option would allow them to engage in other activities while in possession of the herring carrier LOA (versus being restricted to carrying activities only for the minimum seven-day enrollment period). Prior to each fishing trip, the carrier vessels would utilize VMS declarations to indicate what activity they intend to engage in during the trip. If the vessel declares "carrier other," then it cannot carry Atlantic herring on that trip.

- Herring vessels on standard fishing trips would declare HER-HER for a herring fishing trip, or DOF when not participating in the fishery.
- Carrier vessels that possess the Carrier LOA could declare HER-CAR. These vessels would be subject to the provisions of the LOA and would not be allowed to carry fishing gear or other species on that trip.
- Carrier vessels that possess the Carrier LOA could declare OTH-CAR. These vessels would not be allowed to carry fishing gear or Atlantic herring on that trip.

3.1.3.2.3 Option 3: Dual Option for Carriers (VMS or Current LOA) *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

This option would provide flexibility for herring carriers to either choose to:

A. Utilize a VMS for declaration, eliminate the minimum seven-day enrollment period for carrying (LOA restriction), and engage in other activities during LOA enrollment (identical to the provisions described in the previous option); or

B. Maintain the status quo (minimum seven day enrollment period with current LOA restrictions, described in Table 2).

Rationale: The measures to address carrier vessels are intended to provide more flexibility to vessels engaging in carrying activities. These options were developed by the Council in response to comments/suggestions from the fishing industry during the development of the Amendment 5 catch monitoring program. Carrier vessels would have increased flexibility so that they could declare what activity they would be engaging in on a trip-by-trip basis rather than being required to remain in one activity a week at a time. One of the most frequently lamented impacts of regulations in any fishery is the restriction on participants' ability to make quick changes in their choice of species to pursue, gear to use, and trip schedule. While this option would not remove all restrictions on such choices, it would allow carrier vessels to have more rather than less flexibility at the trip level. This flexibility could also benefit herring-dependent communities since the vessels would presumably base their choices on the needs of their community-based dealers and/or buyers.

The ***Preferred Alternative*** provides the most flexibility and accommodates smaller carrier vessels that do not utilize VMS and is similar to the multispecies requirements for common pool vessels fishing in the Restricted Gear Areas (RGAs):

Common pool vessels fishing in the RGAs would be required to declare into these areas via VMS, as instructed by the Regional Administrator. In lieu of a VMS declaration, the Regional Administrator may authorize such vessels to obtain a letter of authorization (LOA) to fish in these RGAs. The minimum participation period for these LOAs would be 7 consecutive days, meaning that a vessel must agree to fish in these areas for a minimum of 7 consecutive days. If issued a LOA, a vessel must retain the LOA on board for the duration of the participation period.

3.1.3.3 Measures to Address Transfers of Atlantic Herring At-Sea

In Amendment 5, the Council considered measures to minimize transfers at sea and/or standardize reporting requirements for vessels transferring/receiving Atlantic herring.

3.1.3.3.1 Option 1: No Action *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

If no action is taken, the current provisions for transferring herring at-sea (status quo) would remain effective (summarized below):

- Transfers at sea from a catcher vessel to a vessel that receives herring for personal use as bait:
  - A vessel that transfers herring at sea to a vessel that receives it for personal use as bait must report all catch via the required reporting system (daily VMS for limited access vessels and weekly IVR for open access vessels) and must report all transfers on the Fishing Vessel Trip Report (VTR). The catcher vessel must report all herring catch on their weekly VTR and indicate on their VTR that herring catch was transferred to another vessel for use as bait. The vessel receiving herring for personal use as bait is not required to have a federal herring permit, and as such does not have any reporting requirements.

- Transfers at sea from a catcher vessel to a carrier vessel:
  - A vessel that transfers herring at sea to an authorized carrier vessel must report all catch via the required reporting system (daily VMS for limited access vessels and weekly IVR for open access vessels) and must report all transfers on weekly VTRs. Each time the vessel offloads to the carrier vessel is defined as a trip for the purposes of reporting requirements and possession allowances.
  - A carrier vessel must have an Atlantic herring Carrier LOA (carrier LOA) from the Regional Administrator, must operate exclusively as a herring carrier, and is prohibited from having any fishing gear on board. Vessels issued a carrier LOA may not have any species on board other than herring, with the exception of multispecies received from vessels issued a Category A or B herring permit.
  - The vessel that catches the herring (catcher vessel) is responsible for reporting all catch on their weekly VTR. The catcher vessel's VTR for a trip should note the dealer name and permit number where the carrier vessel is going to land the herring. In addition, the catcher vessel is responsible for giving the carrier vessel a copy of their VTR serial number.
  - Carrier vessels must provide each catcher vessel's VTR serial number to each dealer purchasing the catch. The carrier vessel's VTR serial number should not be provided to the dealer(s).
  - The carrier vessel is required to submit VTRs which indicate 'no catch' for the days in which they were carrying, and should note the vessel name and permit number of the catcher vessel they were carrying for on their VTR.
  - Although the carrier vessel lands the catch, the dealer is responsible for attributing catch the catcher vessel using the vessel name, permit number, and VTR serial number the catcher vessel provided to the carrier vessel.

- A vessel that transfers herring at sea to an at-sea processor must report all catch via the required reporting system (daily VMS for limited access vessels and weekly IVR for open access vessels) and must report all transfers on weekly VTRs. Each time the vessel offloads to the at-sea processing vessel is defined as a trip for the purposes of the reporting requirements and possession allowances. For each trip, the vessel must submit a VTR and the at-sea processing vessel must submit the detailed dealer report.

- Transfers at sea to another permitted herring vessel:
  - A transfer between two vessels issued valid Atlantic herring permits requires each vessel to submit a VTR, filled out as required by the LOA to transfer herring at sea, as well as a real-time catch report (daily VMS for limited access vessels and weekly IVRs for open access vessels) for the amount of herring each vessel catches.
  - The catcher vessel must report all catch on their weekly VTR. The catcher vessel should indicate on their VTR that herring catch was transferred to another federally permitted herring vessel and include the name and permit number of the vessel receiving the catch.
  - The permitted herring vessel that receives the catch is required to submit VTRs that indicate 'received catch' and should note the vessel name and permit number of the catcher vessel on their VTR.

Rationale: During the early development of Amendment 5 (part of Amendment 4 in 2008), NMFS identified transfers-at-sea as one potential issue to address when developing a more comprehensive catch monitoring program for the herring fishery. During the 2007 and 2008 fishing years, only a small number of bait transactions were recorded for 10,000 pounds or more. The largest transaction reported was for 20,000 pounds. However, it was unclear at the time what percentage of the total transfers at sea and/or bait transactions between vessels these numbers may represent because this activity was thought to be under-documented due to the reporting system. NMFS suspected that transfer at-sea activity may be substantially higher than the data indicated and felt that addressing this issue could help to resolve some discrepancies between databases and provide for more complete and accurate records of the activity occurring in this fishery. The Council consequently developed options to limit transfers-at-sea to specific permit categories, with specific reporting requirements.

While analyzing the options under consideration in the Amendment 5 DEIS, the Herring PDT reviewed herring transfers at sea and agreed that issues related to reporting/monitoring of herring transferred at sea have largely been clarified between NMFS and the industry in recent years and that the amount of herring affected by this activity is minimal. Information presented in Table 127 in Section 6.1.2.2.5 of this document supports the conclusion that this activity represents a very small fraction of the Atlantic herring fishery. Public comment regarding the options under consideration in the DEIS was somewhat mixed, although a large proportion of those who commented expressed support for the no action option because of the potential impacts of the other options on non-federally-permitted fishing operations (recreational, tuna, lobster). The Council agrees that the additional reporting burdens outweigh the potential benefit of taking action to limit transfers at sea, because of the small fraction of catch this activity represents as well as recent improvements in catch reporting (and clarifications to reporting requirements) implemented by NMFS in cooperation with the industry.

3.1.3.3.2 Option 2: Restrict Transfers At-Sea to Only Vessels with Category A or B Limited Access Herring Permits

This measure would allow only vessels participating in the limited access directed fishery for Atlantic herring (Category A or B permits) to transfer herring at sea.

- Transferring and receiving vessels would be required to possess a limited access Category A or B permit for the herring fishery.
- Herring carrier vessels operating under a Carrier LOA would be exempt from this requirement.

3.1.3.3.3 Option 3: Prohibit Transfers At-Sea to Non-Permitted Vessels

This measure would allow only vessels that possess a federal Atlantic herring permit to transfer herring at sea. Non-permitted vessels would be prohibited from receiving herring at-sea, even for personal use as bait.

- Transferring and receiving vessels would be required to possess a Category A, B, C, or D permit for the herring fishery. The Category D permit is an open access permit, so any vessel can obtain this permit, but possession of this permit subjects the vessel to VTR and other reporting requirements.

This measure may improve reporting compliance. Requiring a federal permit of some sort by all vessels engaged in the transfer activity reduces the likelihood that some herring catch, even in small amounts, will not be documented. However, this measure would require that vessels with no Federal permits (recreational vessels, for example) obtain a permit for herring and comply with all related reporting requirements.

3.1.4 Trip Notification Requirements

The Council considered several options (described below) to expand current trip notification requirements in the Atlantic herring fishery. Option 1 represents the no action alternative and would maintain current requirements for pre-trip and pre-landing notifications. Option 2 incorporates all limited access vessels into the pre-trip notification system (PTNS) for observers upon the implementation of Amendment 5, and Option 3 summarizes the modifications to the pre-landing notification requirements that are under consideration. When the Council selected final measures for Amendment 5, it selected Options 2 and 3 in combination with each other as the ***Preferred Alternative***.

3.1.4.1 Option 1: No Action

If the no action option is selected, notification requirements would remain the same upon implementation of Amendment 5. Current notification requirement are described below.

All vessels issued a Category A (All Areas Limited Access) or Category B (Areas 2/3 Limited Access) Permit fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished, as well as Categories C and D (Limited Access Incidental Catch and Open Access) vessels fishing with midwater trawl gear in Areas 1A, 1B, or 3 must provide notice of the following information to NMFS at least 72 hours prior to beginning any trip for obtaining an at-sea observer: Vessel name, contact name for coordinating an at-sea observer, telephone number, date, time, and port of departure, and whether the vessel intends to fish in Closed Area I.

•

If a vessel has been issued a limited access herring permit, a vessel representative must activate the VMS unit and declare that the vessel is participating in the herring fishery by entering the code "HER" prior to leaving port. If a vessel representative declares the vessel out of the herring fishery ("DOF") prior to leaving port to target a non-VMS required species, such as mackerel, that vessel may not harvest, possess, or land herring on that trip. Open-access vessels that maintain a VMS unit on board as a requirement for another Federal permit should declare "DOF" before leaving port on a herring trip.

Category A/B vessels fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished, as well as Category C vessels fishing with midwater trawl gear in Areas 1A, 1B, or 3 must notify NMFS Law Enforcement via VMS of the time and place of offloading at least six hours prior to crossing the VMS demarcation line on their return trip to port (or six hours prior to landing if the vessel does not fish seaward of the demarcation line).

In summary:

- The current notification requirement for vessels to request an observer at least 72 hours before leaving port applies to all Category A and B vessels fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished and Category C and D vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3.
- Under the status quo, limited access herring vessels are required to declare a herring trip via VMS prior to leaving port when they participate in the herring fishery.
- Category A and B vessels fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished, and Category C vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3 are also required to notify NMFS Law Enforcement via VMS of the time and place of offloading at least six hours prior to crossing the VMS demarcation line on their return trip to port (or six hours prior to landing if the vessel does not fish seaward of the demarcation line).
- Category D vessels that do not use midwater trawl gear do not have any trip notification requirements. However, if a Category D vessel possesses a VMS because of other Federal permit requirements, it is recommended that the vessel declare out of fishery (DOF) prior to leaving port when participating in the herring fishery.

**Vessels can provide pre-trip notification for multiple trips at one time.*

3.1.4.2 Option 2: Modify and Extend the Pre-Trip Notification Requirements *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

The following modifications to pre-trip notifications are proposed in this option:

1. ***Pre-Trip Notification Requirements (for Observers):*** This option would require all limited access herring vessels (as well as Category D vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3) and all herring carrier vessels to notify the Observer Program through a pre-trip notification system (PTNS – details TBD) **prior to any trip where the operator may harvest, possess, or land Atlantic herring.**

   In order to possess, harvest, or land herring, representatives for Category A, B, and C fishing vessels, as well as Category D vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3 must provide notice to NMFS through a pre-trip notification system **at least 48 hours** prior to beginning the trip, and must provide information including the vessel name, permit number/permit category, contact person name and contact phone number, date sail, time sail, port of departure, gear type, and area intending to fish (i.e., herring management area, river herring area, closed area, etc., consistent with the management measures ultimately adopted in this amendment), as well as target species (target species will be particularly helpful to try to identify directed herring versus directed mackerel trips). There are several methods available for the pre-trip notification: internet; email; and telephone.

   If a vessel has been issued a limited access herring permit, or if the vessel has an open access herring permit and is fishing with midwater trawl gear in Areas 1A, 1B, and/or 3, but does not provide notification to NMFS before beginning the fishing trip, the vessel is prohibited from possessing, harvesting, or landing Atlantic herring on that trip. If a trip is cancelled, a vessel representative must notify NMFS of the cancelled trip, even if the vessel is not selected to carry an observer. All waivers or selection notices for observer coverage will be issued to the vessel by VMS so as to have on-board verification of the waiver or selection.

   Category D vessels that may fish under a higher possession limit in Areas 2/3 only (Section 3.1.5) would be subject to the same notification requirements as Category C vessels (described in this section) regardless of gear type used.

**Vessels can provide pre-trip notification for multiple trips at one time.*

2. ***Pre-Trip VMS Declaration Requirements:*** This option would also add a gear declaration to the existing pre-trip VMS notifications for all herring fishing vessels using VMS to declare in/out of the herring fishery.

Rationale: The existing call-in requirement for vessels to request an observer before leaving port was established by the Council and NMFS in response to concerns about haddock bycatch and the establishment of the haddock catch cap in the herring fishery (Framework 40B to the Multispecies FMP) and applies only to herring midwater trawl vessels subject to the haddock catch cap. Although developed for a very specific purpose, this requirement has been helpful to the Northeast Fisheries Observer Program to determine the schedule of observer coverage and know better where and when herring trips will occur. It also helps NMFS to estimate and target specific levels of coverage in the fishery during the fishing year. If the notification program is set up in the most efficient manner, it can help to reduce operating costs for the observer program, as fishing trips are more predictable and less time is spent determining when/where observed trips should occur. If the expectation is that all herring vessels should be observed during some or all of their fishing operations, then the trip notification requirements could assist the Observer Program in deploying observers in the most efficient way across the entire fishery while minimizing the burden on the vessels.

The Council selected 48 hours for the pre-trip notification, supported by the NEFOP, to be consistent with other pre-trip notification programs in the region. A 72-hour lead time was originally proposed for fleets that had previously very little observer coverage, so additional time was provided to address the geographical range of the fishery and uncertainty about the number of trips and the number of available observers (from service providers). As the programs have grown, more observers are available in more ports for more timely departures. The proposed modifications to the current program (options for notification, timing) are intended to improve efficiency and reduce the burden on the industry and have largely been supported by the industry and other stakeholders.

Modifying and extending the pre-trip notification requirements to all limited access herring vessels through a pre-trip notification system and VMS gear declarations would help to ensure timely deployment of observers to the limited access vessels in the fishery and would facilitate enforcement. Currently, there are three methods available for notifying the Northeast Fisheries Observer Program prior to the start of a fishing trip:

1) Online via the current Pre-Trip Notification System (preferred method);

2) Email: trip notification by email NEFSC.PTNS@noaa.gov; and

3) Telephone.

The Council recognizes that the current PTNS may not accommodate the additional requirements for the herring vessels in Amendment 5. The NEFSC has agreed to work on designing a system that would best suit the fishery and service providers with available resources.

The pre-trip VMS gear declaration was proposed by NMFS and supported by the Council to help facilitate enforcement of management measures like the seasonal purse seine/fixed gear only area in the inshore Gulf of Maine. It would further enhance some of the additional measures proposed in Amendment 5 as well, such as the gear-specific measures to address net slippage (Section 3.2.3.4) and the measures to address midwater trawl access to the year-round groundfish closed areas (Section 3.4.3).

3.1.4.3 Option 3: Extend Pre-Landing Notification Requirement *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

This option would require limited access herring vessels and herring carrier vessels that opt to use VMS (see Section 3.1.3.2) to notify NMFS Law Enforcement via VMS of the time and place of offloading at least six hours prior to crossing the VMS demarcation line on their return trip to port (or six hours prior to landing if the vessel does not fish seaward of the demarcation line).

Category D vessels that may fish under a higher possession limit in Areas 2/3 only (Section 3.1.5) would be subject to the same notification requirements as Category C vessels (described in this section) regardless of gear type used.

Rationale: Extending the VMS pre-landing requirement to all limited access herring vessels encountering herring on a trip may facilitate enforcement and could provide consistency regarding vessels that would be subject to pre-trip and pre-landing notification requirements and may reduce the complexities associated with declarations into/out of the fishery. The notification will also help to facilitate the deployment of dockside samplers through State programs, to the extent that States can work with NMFS to coordinate sampling throughout the fishery. While Amendment 5 does not include a portside sampling program, the measures proposed to address river herring bycatch (Section 3.3.2.2.4) rely, in part, on further support of and coordination with the SMAST/SFC/MA DMF river herring bycatch avoidance project, in which a large percentage of landings are sampled portside. The proposed pre-landing notification is consistent with the support of this project and State portside sampling programs. It also provides information that would benefit a Federal portside sampling program, should one be developed in the future.

3.1.5 Reporting Requirements for Federally Permitted Herring Dealers

In Amendment 5, the Council considered measures to address reporting requirements for federally permitted Atlantic herring dealers. The options that were considered are described below. The Council's ***Preferred Alternative*** is Option 2/Sub-Option 2B.

3.1.5.1 Option 1: No Action (Status Quo Dealer Reporting Requirements)

Under this option, reporting requirements for federally permitted Atlantic herring dealers would remain the same.

Dealers, including at-sea processors, must submit, for each transaction, an electronic dealer report each week. Reports are due by midnight (Eastern Time) each Tuesday for the week that ended the previous Saturday at midnight. Reports must include the *correct* vessel name and Federal permit number of each vessel that harvested any fish received along with the correct weight units for purchased fish. Dealers must also report the VTR serial number used by each vessel that harvested fish. Dealers are required to submit a report even if there is no activity during a week.

- Reporting Herring Landed by a Carrier Vessel
- Dealers must attribute catch to the vessel that harvested the herring, which may not necessarily be the vessel that landed the herring. Vessels acting as herring carriers must obtain the VTR serial number from the catcher vessel. Subsequently, dealers must request the name, permit number, and VTR serial number of the catcher vessel from the carrier vessel, and report the fish as being harvested by the catcher vessel. Dealers should not report landings from a carrier vessel, as it may lead to double counting landings and could lead to trip limit reductions in a particular management area.

Reporting Haddock Landed from Herring Vessels

Dealers, including at-sea processors, that cull or separate all other fish from the herring catch must separate and retain all haddock offloaded from vessels that have a Category A or B permit fishing on a declared herring trip and from vessels that have a Category C or D permit fishing with midwater trawl gear in Areas 1A, 1B, and/or 3. Any haddock may not be sold, purchased, received, traded, bartered, or transferred, and must be retained, after it has been separated from the herring, for at least 12 hours for dealers and processors on land, and for 12 hours after landing on shore by at-sea processors for inspection by law enforcement officials. The dealer or at-sea processor must report all such haddock on the weekly electronic dealer report and must use the appropriate disposition code for the haddock. The weekly dealer report must clearly indicate the vessel name and permit number of the vessels that caught the retained haddock.

3.1.5.2 Option 2: Require Dealers to Accurately Weigh All Fish *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5 (with Sub-Option 2B), as voted at the June 19-21, 2012 NEFMC Meeting.

This option would require federally permitted Atlantic herring dealers to accurately weigh all fish.

Sub-Option 2A: This sub-option would require federally permitted Atlantic herring dealers to accurately weigh all fish. If dealers do not sort by species, they would be required to document (annually in dealer applications) how they estimate the relative composition of a mixed catch, to facilitate quota monitoring and cross-checking with other data sources.

Sub-Option 2B (Preferred): This sub-option would require federally permitted Atlantic herring dealers to accurately weigh all fish. If dealers do not sort by species, they would be required to document (for individual landing submissions) how they estimate the relative composition of a mixed catch, to facilitate quota monitoring and cross-checking with other data sources.

Sub-Option 2C: This sub-option would require federally permitted Atlantic herring dealers to obtain vessel representative confirmation of SAFIS transaction records to minimize data entry errors at the first point of sale. It would require vessel owners/operators to review and validate all catch information reported for their vessels in Fish-on-Line (FOL) on a weekly basis, including VMS, VTR, and dealer data. If data issues are noted by the vessel owner/operator they would indicate a data issue and provide comments describing the issue, this would create an issue report to NMFS in FOL. NMFS would follow up on all issue reports to resolve discrepancies by working with vessel operators and dealers to correct data submissions. If no data issues are noted, the vessel's owner/operator would indicate such.

Additionally, NMFS recommends increasing the frequency of VTRs and dealer reports to improve the effectiveness of Sub-Option 2C. VTRs would be required to be submitted within 24 hours of the end of a trip and dealer reports would be required to be submitted within 24 hours of receipt or purchase. These changes would increase the timeliness of reports and would provide data to NMFS for validation sooner than they are available currently. While these changes would not likely have a significant impact on information used in weekly monitoring, they would improve the validation efforts that are currently conducted by NMFS and improve the overall state of data in these fisheries.

Rationale: The ***Preferred Alternative*** for reporting requirements relates to the overall goal of Amendment 5 to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the MSA, and the first objective of the amendment to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. In addition, the ***Preferred Alternative*** relates to the following goals/objectives of the Amendment 5 catch monitoring program:

1. To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species caught in the herring fishery;
    - Review federal notification and reporting requirements for the herring fishery to clarify, streamline, and simplify protocols;
2. Develop a program providing catch of herring and bycatch species that will foster support by the herring industry and others concerned about accurate accounts of catch and bycatch, i.e., a well-designed, credible program;
    - Avoid prohibitive and unrealistic demands and requirements for those involved in the fishery, i.e., processors and fishermen using single and paired midwater trawls, bottom trawls, purse seines, weirs, stop seines, and any other gear capable of directing on herring;
    - Improve communication and collaboration with herring vessels and processors to promote constructive dialogue, trust, better understanding of bycatch issues, and ways to reduce discards;

Public comments on the Amendment 5 DEIS indicated that requirements for dealers to accurately weigh fish are a high priority for a substantial number of stakeholders in the fishery – tuna, groundfish, and recreational fishermen, environmental interests, and other stakeholders. Moreover, herring industry members who commented on the Amendment 5 DEIS expressed support for the proposed requirement for dealers to accurately weigh fish. The Council supports the vast majority of public comment received on this issue and is implementing the proposed requirements for herring dealers to address this issue and better achieve the goals and objectives of Amendment 5.

While it is generally recognized that dealers already weigh fish and it is required that federally-permitted dealers report the weight of fish they purchase in pounds (for all fisheries/transactions), the Council believes that establishing this requirement by regulation will improve catch monitoring in the herring fishery due to diversity within the fishery and the numerous methods for offloading/weighing/selling Atlantic herring. These various methods have been reviewed by the Council and are described in detail in Appendix I of this document (Volume II): Discussion Paper: *Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery*.

Because of the diversity associated with the fishery, the ***Preferred Alternative*** does not specifically require all fish to be weighed on a scale, but does provide for the use of scales and standard volumetric measurements in a manner designed to improve accuracy, as described in Appendix I (Volume II). Furthermore, implementing this requirement and standardizing the methods by which dealers weigh all catch and requiring vessels to confirm the amount of fish landed should result in better overall estimates of catch and help ensure that catch limits are not exceeded. Accurate landings data will also aid in monitoring any catch caps that may be established in the future, and in achieving better catch and bycatch estimates of small-bodied fish that are often landed with herring, such as river herring and shad.

In addition, to the extent that directed landings informs incidental catch caps (often substantially), accurate directed landings data can be important for managing catch of non-target species, including river herring, if the Council establishes such a catch cap in the future. Based on observer data and discussions with industry, there are cases where various small pelagic fish are caught and processed together such that while the overall catch of "fish" is reported, it is not fully broken down by species. This effectively

results in misreporting even if the total weight of all fish in known, and fish that make up a small proportion of a catch, like river herrings and shads, may go unreported. Sub-Option 2B (***Preferred Alternative***) would require documentation of how such mixed catches are handled so that the extent of potential misreporting can be further evaluated.

The implementation of sub-option 2B is intended to facilitate quota monitoring and cross-checking with other data sources. Requiring dealers to document (for individual landing submissions) how they estimate the relative composition of a mixed catch provides qualitative information that may not directly be utilized for quota monitoring, but the additional information may help clarify methods that dealers use to determine the weight of fish and comply with the overall requirement to accurately weigh the fish. Sub-option 2B (per-landing documentation) was selected over 2A (annual documentation) so that variability in weighing/reporting methods throughout the fishery can be better understood. Sub-option 2B was also selected over sub-option 2C because of potential problems associated with requirements for fishermen to cross-check dealer reports; industry comments suggested that the requirements associated with sub-option 2C could potentially put fishermen and dealers in adversarial and competitive regulatory positions. The Council agrees and believes that implementing the proposed weighing requirements, along with sub-option 2B should improve the accuracy of dealer reports and reduce discrepancies between datasets.

3.1.6 Changes to Open Access Permit Provisions for Limited Access Mackerel Vessels in Areas 2/3

Several management options were considered in Amendment 5 to address concerns about herring bycatch on limited access mackerel vessels that did not qualify for a limited access herring permit. The Council's ***Preferred Alternative*** is Option 2 (described below).

3.1.6.1 Mackerel Option 1: No Action

Under this option, no action would be taken in Amendment 5 to address herring/mackerel fishery interactions and concerns about the potential for herring bycatch in the directed mackerel fishery. This option would maintain the status quo with respect to mackerel vessels with an open access herring permit.

- The open access incidental catch permit for herring (Category D) would continue to apply to all management areas.
- Vessels that obtain the open access incidental catch herring permit would continue to be restricted by a possession limit of 3 mt of herring per trip (6,600 pounds) in all management areas and limited to one landing per calendar day up to the 3 mt possession limit.
- When catch is projected to reach 95% of the sub-ACL in a management area and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.

3.1.6.2 Mackerel Option 2: Increase the Open Access Possession Limit to 20,000 Pounds in Areas 2/3 for Vessels that also Possess a Federal Limited Access Mackerel Permit *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Under this option, two open access permits for herring would be created, one for all management areas and one for mackerel fishery participants in Areas 2/3 only:

1. The current provisions for the Category D permit, including the 3 mt possession limit, reporting requirements, and landings restrictions, would apply to an open access permit for all management areas, as described in the no action option;
2. A new open access incidental catch permit would be created for limited access mackerel fishery participants in Areas 2/3 only that do not have a limited access herring permit; this permit would be associated with a 20,000 pound possession limit for herring; all other provisions currently associated with the current open access Category D permit would apply:
    - Vessels that do not qualify for a limited access herring permit and possess a federal limited access permit for Atlantic mackerel would be eligible for this herring permit.
    - **Vessels that obtain this permit would be restricted to fishing for herring in Areas 2/3 only**, under a possession limit of 20,000 pounds of herring and limited to one landing per calendar day up to the 20,000 pound possession limit.
    - For quota/ACL monitoring purposes, reporting requirements for vessels that possess this permit would be consistent with requirements for limited access Category C vessels.
    - When catch is projected to reach 95% of the sub-ACL in a management area and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.

This measure includes a provision to allow the Council to adjust the herring possession limit associated with this permit in the future through a framework adjustment or through the herring fishery specifications process (see Section 3.5 for additional measures that can be implemented through the fishery specifications or framework adjustment process).

Rationale: Since the implementation of Amendment 1, concerns have been raised about vessels participating in the Atlantic mackerel fishery that do not qualify for any of the limited access herring permits, either because they do not have adequate herring landings history between 1988 and 2003, or because they are new participants in the mackerel fishery. These vessels are currently required to fish with the open access incidental catch permit to retain any herring, and they may encounter herring in amounts larger than 3 mt on some fishing trips. Without a permit that allows them to retain an adequate amount of herring, these vessels may be forced to discard any herring they catch incidentally. If the mackerel fishery grows in the future, a herring bycatch problem could become an increasing concern.

The overlap between the Atlantic herring and mackerel fisheries is universally recognized as an important fishery management issue that the Council has always intended to accommodate in the most appropriate manner. If the Category D vessels have not been targeting mackerel or taking trips where they may encounter a mix of herring and mackerel (and/or other species) more recently (for a variety of reasons), VTR records may not reflect a bycatch problem at this time and may not fully characterize the potential for this problem to exist in the future. The industry has stated that these vessels have not been fishing for mackerel as much in recent years because (1) they are smaller vessels, and the mackerel fishery shifted

into offshore areas; and (2) concerns about encountering herring in quantities larger than 3 mt on "mixed" trips and consequently being in violation of the herring possession limit have influenced their decisions about taking these trips at all.

The options considered in Amendment 5 are intended to minimize the potential for regulatory discarding of Atlantic herring by limited access mackerel vessels that did not qualify for a limited access herring permit. The measures under consideration to increase the open access possession limit for limited access mackerel vessels in Areas 2/3 relate to the overall goal of the amendment, which is to improve catch monitoring and ensure compliance with the MSA. These measures are intended to minimize regulatory discarding and therefore specifically address National Standard 9 (minimize bycatch and bycatch mortality).

The limited access program for the Atlantic mackerel fishery is based on a multi-tiered approach to a limited access permit structure, with each tier specifying different criteria for limited access qualification. Proposed qualification for different limited access mackerel permits was proposed, in part, to address the overlap between the herring and mackerel fisheries and minimize problems that may result if herring vessels do not receive limited access permits for mackerel. The ***Preferred Alternative*** therefore creates a form of reciprocity between limited access herring fishery participants and limited access mackerel fishery participants. Since each are likely to catch the other's targeted species as bycatch/incidental catch, the equity issue may be resolved by permitting similar levels of non-directed catch in both fisheries. The restriction to Areas 2/3, the proposed possession limit, and reporting requirements assure that the ACLs will not be breached by allowing mackerel boats increased possession limits of herring. Mackerel vessels that may qualify and choose to obtain the new open access permit for herring would have the burden of increased notifications and reporting (the requirements would be the same as those for Category C herring vessels). The ***Preferred Alternative*** was widely supported by the herring and mackerel fishery participants, as well as the Herring Advisory Panel and Mid-Atlantic Fishery Management Council, during the development of Amendment 5.

Since the Amendment 5 DEIS was completed, information about mackerel limited access qualifiers has been updated, and it appears that the number of vessels likely to obtain the proposed open access herring permit for Areas 2/3 is far less than originally predicted, therefore reducing some of the potential concerns originally expressed by the Herring PDT. The updated information can be found in Section 6.1.5.6 of this document (p. 387).

3.1.6.3 Mackerel Option 3: Increase the Open Access Possession Limit to 10,000 Pounds in Areas 2/3 for Vessels that also Possess a Federal Limited Access Mackerel Permit

Under this option, two open access permits for herring would be created, one for all management areas and one for mackerel fishery participants in Areas 2/3 only:

1. The current provisions for the Category D permit, including the 3 mt possession limit, reporting requirements, and landings restrictions, would apply to an open access permit for all management areas, as described in the no action alternative;

2. A new open access incidental catch permit would be created for limited access mackerel fishery participants in Areas 2/3 only that do not have a limited access herring permit; this permit would be associated with a 10,000 pound possession limit for herring; all other provisions currently associated with the current open access Category D permit would apply:

    - **Vessels that obtain this permit would be restricted to fishing for herring in Areas 2/3 only**, under a possession limit of 10,000 pounds of herring and limited to one landing per calendar day up to the 10,000 pound possession limit.

    - For quota/ACL monitoring purposes, reporting requirements for vessels that possess this permit would be consistent with requirements for limited access Category C vessels.

    - When catch is projected to reach 95% of the sub-ACL in a management area and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.

3.2 CATCH MONITORING: AT-SEA

Measures proposed in Amendment 5 to address catch monitoring at-sea include provisions for allocating observer coverage on some/all limited access herring vessels, measures to improve/maximize sampling at-sea, measures to address net slippage, and consideration of a maximized retention experimental fishery.

3.2.1 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels

The alternatives under consideration to allocate observer coverage on limited access herring vessels (Categories A/B/C) are described in the following subsections. In general, each management alternative considered by the Council includes:

1. **Targets/priorities for allocating coverage;**
2. **Provisions/process for reviewing/allocating/prioritizing coverage;**
3. **Options for funding observer coverage; and**
4. **Provisions for utilizing service providers and authorizing waivers in specific circumstances that may prevent deployment of an observer.**

For all alternatives that allocate observer coverage in Amendment 5, limited access herring vessels will be required to comply with trip notification provisions and reporting requirements, as modified through the other management measures proposed in this amendment.

The Council's ***Preferred Alternative*** was selected at the June 2012 Council meeting and is Alternative 2 (100% Observer Coverage), applied to Category A and B limited access herring vessels, with some clarifications (described below). The Council determined that this alternative should apply only to Category A and B vessels and that industry funding should be phased-in; related provisions are included within the alternative, and it is anticipated that additional details will be fleshed out during implementation. The Council also proposes to review coverage levels for these vessels after two years of implementation.

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

3.2.1.1 Alternative 1: No Action Alternative

The no action alternative represents the status quo for allocating observer coverage on limited access herring vessels. This alternative would allocate observer coverage on limited access herring vessels through the current optimization/allocation process.

The priorities for allocating sea days would continue to be based on the current process (no action/status quo). The analytical basis for allocation of future sea day coverage rests on a target level of precision (i.e., 30% CV) and an expectation that the pattern of fishing activity observed in the prior year will be similar to the next year. Fishing activity by fleets often changes in response to patterns of stock abundance, weather, and fishery regulations. The SBRM is designed to adapt to these changing circumstances. When a shortfall occurs, a prioritized sea day allocation is made. This allocation uses a combination of statistical methods and ad-hoc methods to assign sea days while keeping within the federally funded constraints.

Under the no action alternative, no changes would be made to the SBRM process for reviewing and allocating observer coverage. As established by the SBRM omnibus amendments (NEFMC 2007; NMFS 2008), the Councils and public are provided an opportunity to consider and provide input into decisions regarding prioritization of at-sea observer coverage allocations if the expected resources necessary may not be available to achieve CV-based performance goals. In any year in which external operational constraints would prevent NMFS from fully implementing the required at-sea observer coverage levels, the Regional Administrator and Science and Research Director will consult with the Councils to determine the most appropriate prioritization for how the available resources should be allocated. If re-prioritization is undertaken, the re-prioritized sea day allocations will be summarized in a subsequent document.

Under the no action alternative, no action would be taken in Amendment 5 to generate funds or require specific funding for observer coverage required on limited access herring vessels. It is assumed that Federal funds would be utilized to fully support the administration of the fishery management plan and data collection required through the provisions in this amendment. While observer coverage may be ***desired*** or ***targeted*** at a higher rate, realized annual coverage would be based on the allocation of Federal resources and would be subject to prioritization in the face of funding limitations. Under the no action alternative, no provisions would be established for utilizing service providers for additional observer coverage on limited access herring vessels.

A detailed discussion regarding the impacts of the no action alternative, as well as the current methodology for allocating observer days and its relationship to the limited access Atlantic herring fishery, is presented in Appendix III (Volume II) and summarized in Section 6.2 of this document.

3.2.1.2 Alternative 2: Require 100% Observer Coverage on Limited Access Category A and B Herring Vessels *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Alternative 2 would require at-sea observers on every trip taken by limited access herring vessels (Categories A and B only) unless they are declared out of the herring fishery (through VMS). Provisions to address the necessary elements of Alternative 2 are described below. The Council's rationale for selecting this alternative with some additional clarifications is provided below, following the detailed description of the alternative.

Priorities for Allocating Sea Days/Target Coverage Levels (Alternative 2)

Under Alternative 2, the priorities/targets for coverage would be 100% of declared herring trips on limited access Category A and B vessels.

Process for Reviewing/Allocating Observer Days (Alternative 2)

Under Alternative 2, no changes would be made to the process for reviewing and allocating observer coverage. On an annual basis, the Regional Administrator and Science and Research Director will consult with the Councils to determine the most appropriate prioritization for how available Federal resources should be allocated. Additional days to meet the 100% requirement on limited access herring vessels would be funded through other sources (see options below).

The requirement for 100% coverage on Category A/B herring vessels would be reviewed two years after it becomes effective.

Funding Options (Alternative 2)

Under Alternative 2, Funding Option 1 will apply during the first year under Amendment 5 regulations, during which time the Council will work with NMFS and the industry to develop the details of the industry-funded component of Option 2. The target maximum industry contribution will be $325 per sea day. After further discussion/development by the Council and NMFS, Option 2 will become effective one year following the implementation of Amendment 5.

Option 1: No Action (Preferred Alternative for Year 1)

Under this option, no action would be taken in Amendment 5 to generate funds or require specific funding for observer coverage required on limited access herring vessels. It is assumed that Federal funds would be utilized to fully support the administration of the fishery management plan and data collection required through the provisions in this amendment. While observer coverage may be ***desired*** or ***targeted*** at a higher rate, realized annual coverage would be based on the allocation of Federal resources and would be subject to prioritization in the face of funding limitations. This option equates to the status quo with respect to funding observer coverage in the limited access herring fishery.

Under this option, the requirement for 100% observer coverage on Category A and B vessels will only be met to the extent that Federal resources can support it. If Federal resources are not available, waivers would be issued according to the provisions described below.

Option 2: Federal and Industry Funds (Preferred Alternative)

This option would require that observer coverage on limited access herring vessels be funded by Federal resources, whenever they are available. To the extent that Federal resources are not available to fund observer coverage at levels consistent with the Amendment 5 provisions, Category A and B herring vessels would be responsible for covering costs associated with contracting service providers for the additional observer coverage.

This option is intended to become effective one year following the implementation of Amendment 5, with a target maximum industry contribution of $325 per sea day. The details of this program would be developed by the Council and NMFS, in cooperation with the industry, during the first year under Amendment 5. The Council has identified this issue as a management priority for 2013, and work with NMFS, the NEFSC, and the MAFMC is already underway.

Provisions for Utilizing Observer Service Providers and Authorizing Waivers (Alternative 2)

Because Alternative 2 requires 100% observer coverage on limited access herring vessels, provisions would be included that authorize the use of non-government service providers for sea sampling in the event that Federal funds are not sufficient to provide 100% coverage and/or the fishing industry is required to fund some/all of the sea sampling. Many of the details related to the following provisions would be fleshed out during the development/implementation of the industry-funded component of the monitoring program (to become effective one year after the implementation of Amendment 5).

Prior to any trip when declared into the herring fishery (declared "HER"), limited access herring vessel owners, operators, and/or representatives would be required to provide notice to NMFS and request an observer through the pre-trip notification system, consistent with the provisions described in Section 3.1.4 of this document. If observer coverage must be procured through an independent service provider, NMFS would notify the vessel owner, operator, and/or representative of the requirement within 24 hours of the vessels' notification to NMFS of the prospective herring trip. The vessel would be prohibited from fishing for, taking, possessing, or landing any Atlantic herring without carrying an observer for that trip unless the vessel has been issued a waiver. Any requirement to carry an observer on a particular trip may be waived by NMFS. All waivers for observer coverage will be issued to the vessel by VMS so there is on-board verification of the waiver (see more information about waivers below).

Observer Service Provider Certification, Approval, Responsibilities

Regulations specifying the use of observer service providers in the sea scallop fishery are provided in 50 CFR 648.11(h) and (i) – *Observer service provider approval and responsibilities* and *Observer certification* and would apply to service providers utilized by Atlantic herring vessels for sea sampling if/when federally funded observers cannot be made available. These provisions are consistent with those for service providers in other Federal fisheries in the Northeast region.

****Option: State Agencies as Service Providers for Observer Coverage****

In Amendment 5, the Council considered an option to authorize State agencies to be service providers for catch monitoring (sea sampling/observer coverage).

Option 1: No Action. Under the no action option, States would not be authorized in Amendment 5 as service providers for observer coverage. If a State Agency intends to provide sea sampling services for Atlantic herring vessels, it would apply to NMFS to become an authorized service provider, consistent with the provisions specified in 50 CFR 648.11(h) and (i)– *Observer service provider approval and responsibilities* and *Observer certification.*

Option 2: States Authorized as Service Providers *(Preferred Alternative)*. Under this option, Amendment 5 would authorize all States in the Northeast Region as service providers for sea sampling on limited access Atlantic herring vessels. States would not be required to apply to NMFS for an authorization and comply with the provisions specified in 50 CFR 648.11(h) and (i) – *Observer service provider approval and responsibilities* and *Observer certification*. To ensure data compatibility, States that are authorized as service providers must ensure that data collection standards and methods are consistent with NEFOP standards and methods for the herring fishery. The details of these provisions will be fleshed out upon implementation of the industry-funded monitoring component, including requirements for third-party service providers.

Issuance of Waivers If/When Observers Cannot be Deployed (Preferred)

Under Funding Option 1 (Year 1): In the event that an observer is required for a particular fishing trip but cannot be provided by the NEFOP, NMFS would notify the vessel within 24 hours of the vessel's notification of the prospective herring trip. Waivers will not be granted if the trip is to include tows in areas/times associate with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

Under Funding Option 2: When Funding Option 2 becomes effective, the vessels' owner/operator/manager may be required to arrange for carrying an observer from one of the service providers approved by NMFS when a NEFOP observer cannot be deployed.

The owner/operator/manager of a vessel selected to carry an observer must contact the observer service provider and must provide at least 48 hours' notice in advance of the fishing trip for the provider to arrange for observer deployment for the specified herring trip. A list of approved service providers will be published on the NMFS/NEFOP website. If a certified observer cannot be procured within 24 hours of the advanced notification due to the unavailability of an observer, the vessel owner/operator/manager may request a waiver from NMFS/NEFOP from the requirement for observer coverage on that trip, but only if all of the available service providers have been contacted in an attempt to secure observer coverage, and no observer is available. In this case, if a waiver is to be issued by NMFS, consistent with the provisions in this amendment, then it will be issued within 12 hours. Waivers will not be granted if the trip is to include tows in areas/times associate with measures to avoid or protect river herring.

Rationale for Preferred Alternative: The Council believes that the provisions for observer coverage proposed in Amendment 5 can enhance catch monitoring and achieve many of the goals and objectives of this amendment. Support for 100% observer coverage on Category A and B herring vessels was largely supported by a majority of stakeholders who commented on the Amendment 5 DEIS and alternatives under consideration (see summary of comments and responses in Section 8.1.4 of this document and complete public comments in Appendix IX and X, Volume II). Many stakeholders, as well as some members of the herring industry, feel that 100% observer coverage is necessary for the most active vessels to either confirm or disprove the claims that have been made by many regarding bycatch in the herring fishery. The Council agrees with the need to increase observer coverage in the fishery to determine the true nature and extent of bycatch in the fishery, and to better address and manage bycatch issues in the future.

The Council also agrees that the requirement for 100% observer coverage should be focused on the most active vessels in the herring fishery and is proposing to limit this requirement to Category A and B vessels, which catch 97% or more of all Atlantic herring (see information presented in Section 5.5.1 of this document). Category C vessels, although part of the limited access fishery, represent a small fraction of the overall herring catch, and because of the costs associated with the proposed requirements, the Council determined that limiting this measure to A and B vessels at this time would achieve the goals and objectives of the catch monitoring program while reducing some of the negative impacts on fishery-related businesses and communities. The costs of the Preferred Alternative on Category A/B versus Category C vessels are discussed in Section 6.2.6 of this document.

Some stakeholders who commented on the Amendment 5 DEIS desired to have the Federal government cover the entire cost of observer coverage, while others support splitting the costs between the industry and the government. Because of the significant concerns expressed by NMFS regarding the Federal government's ability to cover 100% of the herring trips on Category A and B vessels, the Council supports a split approach to funding observer coverage in the fishery but recognizes the costs and substantial economic impact on the industry that the proposed coverage rate may have. The economic impacts on fishing-related businesses and communities are discussed in Section 6.2 of this document.

To mitigate some of these economic impacts, the Council will target a per-sea-day industry contribution of $325 when developing the industry-funded portion of this program. The Council proposes to develop the details of this element of the program during the first year after Amendment 5 implementation. This approach allows NMFS to work with the Council, the herring industry, and service providers to develop the most efficient and effective approach for cost-sharing. Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be further developed by the NEFOP, in order to provide consistency across data collection.

It is possible that program costs can be lowered with adequate planning and design time. However, a successful industry-funded monitoring program will probably take a significant amount of time to develop and incorporate into the current management system. Careful attention must be paid to designing the program properly to ensure data quality, reduce trouble-shooting with industry and service providers, increase efficiency, and reduce costs. While this should not delay the selection of final management measures and the completion of Amendments 5, the Council recognizes that this element of the program may require more time for implementation than others and is allowing one year for careful design and implementation.

Because of the need for an industry-funded catch monitoring program to evolve and change to meet the needs of science, management, and the industry, it will be important to structure an industry-funded program such that it can be modified to incorporate various monitoring approaches, possibly including dockside monitoring and electronic monitoring in the future. Evaluation of the existing/evolving monitoring program and continued research into new technologies enhances industry participation in the program and allows for a more bottom-up approach to catch monitoring. This can further enhance the goals and objectives identified in this amendment.

Currently, the States are not providing observer services (i.e. are not acting as observer service providers for the federally funded observer program). The State of Maine does have an employee that collects data at sea in the Atlantic herring fishery, but the other states do not cover the herring fleet, although to a limited degree cover other fisheries. If State Agencies are interested in becoming a certified observer service provider, under the ***Preferred Alternative***, the States would be grandfathered in, and would not be required to apply for approval. This option would limit the amount of information that is obtained and pre-defined, and the State Agencies' operational details would be unknown. The Council's intent with respect to these provisions is to increase sea sampling for the limited access herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data. It is expected by the Council, as recommended by the NEFOP, that States adhere to the same standards and protocols if states are authorized as service providers in Amendment 5.

As part of the measures proposed in Amendment 5, the Council included a provision in Amendment 5 to review observer coverage levels for Category A and B vessels after the first two years of implementation. This provision formally acknowledges the significant costs associated with requirements for 100% observer coverage and necessitates a formal review of observer data gathered under the 100% requirement and evaluation of the need to continue with such high coverage rates. This approach is again intended to minimize adverse impacts on fishery-related businesses and communities.

3.2.1.3 Alternative 3: Require SBRM Observer Coverage Levels as Minimum Levels

This alternative would require that **at a minimum**, the annual levels of observer coverage recommended by the NEFSC's Standardized Bycatch Reporting Methodology (SBRM) analysis be achieved annually for the SBRM fleets identified in this amendment. The process for determining coverage levels using the SBRM methodology is described under the no action alternative. Under Alternative 3, SBRM sea day allocations for "herring fleets" (identified in this amendment) would represent minimum requirements for sea days that must be covered during the upcoming year.

SBRM Fleets to Which This Alternative Applies

Based on the Herring PDT's detailed analysis presented in Appendix III (Volume II), the SBRM fleets to which this alternative applies include:

- New England Midwater Trawl;
- Mid-Atlantic Midwater Trawl; and
- New England Purse Seine.

Priorities for Allocating Sea Days/Target Coverage Levels (Alternative 3)

The priorities for allocating sea days would be based on the SBRM process (no action alternative, Section 3.2.1.1).

Process for Reviewing/Allocating Observer Days (Alternative 3)

Under Alternative 3, no changes would be made to the SBRM process for reviewing and allocating observer coverage. As specified in the SBRM Omnibus Amendment, when a shortfall occurs, a prioritized sea day allocation is made. Under Alternative 3, re-prioritizing or shifting the allocation of observer days on SBRM herring fleets would be prohibited by the Council or NMFS during the annual SBRM review/prioritization process.

Funding Options (Alternative 3)

The funding options under consideration for Alternative 3 are the same as those for Alternative 2 (see Section 3.2.1.2).

Option 1: No Action

Option 2: Federal and Industry Funds

Provisions for Utilizing Observer Service Providers and Authorizing Waivers (Alternative 3)

Under Alternative 3, SBRM observer allocations would be mandated, and shifting days away from the herring fleets during the prioritization process would be prohibited. As a result, additional funding may be necessary to achieve the coverage levels specified by the SBRM, especially if the optimization process limits the amount of Federal resources available to fund sampling at these levels. The Council is therefore considering an option to establish provisions for utilizing service providers in the event that Federal funds are not sufficient. The options to establish provisions for sea sampling service providers under Alternative 3 are the same as those proposed for Alternative 2 (see Section 3.2.1.2).

3.2.1.4 Alternative 4: Allocate Observer Coverage Based on Council-Specified Targets/Priorities

This alternative would require that observer coverage on limited access herring vessels be allocated annually based on the following targets/priorities identified by the New England Fishery Management Council: a 30% CV on catch estimates for Atlantic herring and haddock, and a 20% CV on catch estimates for river herring *(catch = total removals).*

Priorities for Allocating Sea Days/Target Coverage Levels (Alternative 4)

Under this alternative, allocating observer days on limited access Atlantic herring vessels would be based on a process similar to the SBRM, designed to target 30% CV on catch estimates for Atlantic herring and haddock, and a 20% CV on catch estimates for river herring. These targets differ from the current SBRM performance standards in that: (1) river herring is incorporated as a priority species and a basis for allocating observer coverage; (2) the goal of this alternative is to achieve precision targets for total catch estimates (*retained and discarded* – not just discarded); (3) the precision standard for river herring catch estimates more conservative than the current SBRM standards (20% CV versus 30% CV); and (4) a precision target for haddock is identified separately (versus large-mesh groundfish in the current SBRM).

The Council emphasized the need to be practical when determining an appropriate sampling design for at-sea monitoring, especially given available resources. When designing the sampling program, priority should be given to the species of greatest concern, from a biological perspective. It is acknowledged that all species will be sampled regardless of the priorities, and CVs of 30% or even less may be achieved for many of the other species. River herring, haddock, and Atlantic herring have all been identified by the Council as priority species under this alternative.

Process for Reviewing/Allocating Observer Days (Alternative 4)

Option 1 – NEFSC Supplemental SBRM Analysis

Under this option, the NEFSC would prepare a supplemental SBRM analysis to relate SBRM fleets/coverage levels to the limited access herring vessels and evaluate the potential allocation of additional days on these vessels to achieve a 20% CV on river herring catch estimates and a 30% CV on catch estimates for Atlantic herring and haddock. The timing of the supplemental analysis would mirror the annual SBRM prioritization process, and the supplemental analysis/report would be presented to the Council by the NEFSC in conjunction with the annual SBRM Sea Day Analysis and Prioritization.

The NEFSC would utilize approaches similar to those in the SBRM to consider how to effectively increase precision estimates on total river herring catch (kept and discarded) for the herring fleets identified in this alternative. The supplemental report would evaluate CVs for river herring, haddock, and Atlantic herring catch estimates based on the previous year's data, relate the SBRM Sea Day Analysis and SBRM fleets identified in this alternative to the limited access herring vessels, and provide information about the number and distribution of additional observer days to achieve the standards for the limited access herring fleet. The Council would review the additional analysis in the context of prioritizing sea days throughout the region and could evaluate the costs/benefits associated with requiring days above those allocated through the SBRM process to achieve the goals/objectives of the sampling program in this amendment.

The intent of this option is to provide a supplemental process to evaluate the sampling goals and performance standards identified in this amendment without compromising or formally changing the SBRM methodologies or the annual optimization process. This option relies on analyses developed concurrently by the SBRM analysts at the NEFSC and focuses specifically on just the fleets identified in this alternative.

Option 2 – Herring PDT Supplemental Analysis

Under this option, the Herring Plan Development Team (PDT) would prepare a supplemental analysis to relate SBRM fleets/coverage levels to the limited access herring vessels and evaluate the potential allocation of additional days on these vessels to achieve a 20% CV on river herring catch estimates and a 30% CV on catch estimates for Atlantic herring and haddock.

The Herring PDT could utilize different approaches (not just SBRM methods) to evaluate how to effectively increase precision estimates on river herring, haddock, and Atlantic herring catch on limited access herring vessels. The PDT would not be limited to SBRM methodologies under this option. The supplemental Herring PDT Report evaluate CVs for river herring, haddock, and Atlantic herring catch estimates based on the previous year's data, relate the SBRM Sea Day Analysis and SBRM fleets identified in this alternative to the limited access herring vessels, provide information about the number and distribution of additional observer days to achieve the standards for the limited access herring fleet, and provide an estimate of the potential costs of those days.

The intent of this option is to provide a supplemental process to evaluate the sampling goals and performance standards identified in this amendment without compromising or formally changing the SBRM methodologies or optimization process. This option requires the Herring PDT to meet annually to develop analyses concurrently while the NEFSC develops the SBRM analyses related to the allocation of sea days across all fisheries in the region. Timing is an important consideration for this option. The intent would be for the timing of the supplemental analysis to mirror the annual SBRM prioritization process; however, the Herring PDT's supplemental analysis/report would benefit from building on the SBRM analysis. The Council would review the additional analysis in the context of prioritizing sea days throughout the region and could evaluate the costs/benefits associated with requiring days above those allocated through the SBRM process to achieve the goals/objectives of the sampling program in this amendment.

Funding Options (Alternative 4)

The funding options under consideration for Alternative 4 are the same as those for Alternative 2 (see Section 3.2.1.2).

Option 1: No Action

Option 2: Federal and Industry Funds

Provisions for Utilizing Observer Service Providers and Authorizing Waivers (Alternative 4)

Under Alternative 4, observer allocations would be based on Council-specified priorities/targets. As a result, additional days may be necessary to achieve the coverage levels desired by the Council, especially after the SBRM optimization process. The Council is therefore considering an option to establish provisions for utilizing service providers in the event that Federal funds are not sufficient. The options to establish provisions for sea sampling service providers under Alternative 3 are the same as those proposed for Alternative 2 (see Section 3.2.1.2).

3.2.1.5 Summary of Alternatives Under Consideration for Allocating Observer Coverage on Limited Access Herring Vessels

Table 3 summarizes the alternatives under consideration to allocate observer coverage on limited access herring vessels, as they were proposed in the Amendment 5 DEIS.

Alternative 2 represents the ***Preferred Alternative***, applied to Category A/B vessels, and other provisions described in Section 3.2.1.2 of this document. The Council's rationale for selecting the ***Preferred Alternative*** is also provided in Section 3.2.1.2.

Table 3 Summary of Alternatives Under Consideration to Allocate Observer Coverage on Limited Access Herring Vessels

ALTERNATIVE	PRIORITIES/ TARGETS FOR ALLOCATING OBSERVER DAYS	PROCESS FOR REVIEWING/ ALLOCATING DAYS	FUNDING	OBSERVER SERVICE PROVIDERS/WAIVERS	ADDITIONAL COMMENTS
ALT 1: NO ACTION	• SBRM • CAI and other areas/times required in A5	• No Action (SBRM)	• No Action (Federal, subject to resource limitations and priorities)	• No Action (N/A)	
ALT 2: 100% OBSERVER COVERAGE (PREFERRED FOR A/B ONLY)	• 100% of declared herring trips for A/B/C vessels (Preferred Alternative A/B vessels only)	• No Action • SBRM process plus additional days required on A/B/C vessels (Preferred Alternative A/B vessels only)	• Option 1: No Action • Option 2: Federal and Industry Funds	• Consistent with scallop/groundfish regs; additional option to consider States as service providers; waivers at discretion of NMFS; Council may specify instances when waivers may/may not be granted	
ALT 3: REQUIRE SBRM COVERAGE LEVELS AS MINIMUM	• SBRM-recommended coverage levels would be mandated as minimum levels – no reprioritizing • CAI and other areas/times required in A5	• No Action (SBRM)	• Same as Alt 2	• Same as Alt 2	• Herring PDT Analysis evaluates the distribution of limited access herring vessels across the current SBRM fleets to identify the fleets to which this alternative applies
ALT 4: ALLOCATE COVERAGE BASED ON COUNCIL TARGETS	• 30% CV for haddock/herring and 20% CV on for RH catch estimates for A/B/C vessels • CAI and other areas/times required in A5	• Option 1: Supplemental NEFSC/SBRM Analysis • Option 2: Herring PDT Supplemental Analysis	• Same as Alt 2	• Same as Alt 2	• Herring PDT Analysis provides example of supplemental analysis that can be provided to the Council to determine priorities when allocating observer days on limited access herring vessels

*Alternative 2 represents the **Preferred Alternative**, applied to Category A/B vessels, and other provisions described in Section 3.2.1.2 of this document.*

3.2.2 Management Measures to Improve/Maximize Sampling At-Sea

Additional management measures are proposed in Amendment 5 to enhance regulations pertaining to the current at-sea monitoring program. In this section, the Council is proposing measures to maximize the sampling of catch by NMFS-approved observers on board all limited access Atlantic herring vessels (Categories A, B, and C).

3.2.2.1 Option 1: No Action

Under the no action option, no additional provisions would be implemented in Amendment 5 to improve/maximize sampling by at-sea observers.

Current regulations for vessels carrying NMFS-approved sea samplers/observers on board (Section 648.11(d)) specify that owners/operators of fishing vessels must:

1. Provide accommodations and food that are equivalent to those provided to the crew.
2. Allow the sea sampler/observer access to and use of the vessel's communications equipment and personnel upon request for the transmission and receipt of messages related to the sea sampler's/observer's duties.
3. Provide true vessel locations, by latitude and longitude, as requested by the observer/sea sampler, and allow the sea sampler/observer access to and use of the vessel's navigation equipment and personnel upon request to determine the vessel's position.
4. Notify the sea sampler/observer in a timely fashion of when fishing operations are to begin and end.
5. Allow for the embarking and debarking of the sea sampler/observer, as specified by the Regional Administrator, ensuring that transfers of observers/sea samplers at sea are accomplished in a safe manner, via small boat or raft, during daylight hours as weather and sea conditions allow, and with the agreement of the sea samplers/ observers involved.
6. Allow the sea sampler/observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other space used to hold, process, weigh, or store fish.
7. Allow the sea sampler/observer to inspect and copy any the vessel's log, communications log, and records associated with the catch and distribution of fish for that trip.

3.2.2.2 Option 2: Implement Additional Measures to Improve Sampling *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Under this option, the following additional provisions would be implemented in Amendment 5 for limited access herring vessels (Categories A/B/C) to improve sampling by NMFS-approved observers at-sea:

2A. Requirements for a Safe Sampling Station

Vessel operators would be required to provide at-sea observers with a safe sampling station adjacent to the fish deck– this may include a safety harness (if footing is compromised and grating systems are high above the deck), a safe method to obtain samples, and a storage space for baskets and sampling gear. Vessel operators must maintain safe conditions on the vessel for the protection of observers including adherence to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel.

2B. Requirements for "Reasonable Assistance"

Vessel operators would be required to provide NMFS-approved observers with reasonable assistance to enable observers to carry out their duties, including but not limited to obtaining samples and sorted discards. "Reasonable assistance" could be defined as:

- Measuring decks, codends, and holding bins;
- Collecting bycatch when requested by the observers; and/or
- Collecting and carrying baskets of fish when requested by the observers.

2C. Requirements to Provide Notice

Vessels operators would be required to provide observers notice when pumping may be starting and when to allow sampling of the catch, and when pumping is coming to an end.

2D. Requirements for Trips with Multiple Vessels

When observers are deployed on herring trips involving more than one vessel, observers would be required on any vessel taking on fish wherever/whenever possible.

2E. Communication on Pair Trawl Vessels

In pair trawl operations, additional communication would be required between the boats if fish are being pumped to both vessels and to keep the observer informed of catch.

2F. Visual Access to the Net/Codend

Vessel operators would be required to provide and assist NMFS-approved observers in obtaining visual access to the codend (or purse seine bunt) and any of its contents after pumping has ended, before the pump is removed. On trawl vessels, the codend and any remaining contents should be brought on board. If this is not possible, the vessel operator would be required to work with the observer to ensure that the observer can see the codend and its contents as clearly as possible. The observer will document this process and what he/she is able to see/sample in the observer log.

Rationale: The measures proposed to improve sea sampling relate directly to the first objective stated in Amendment 5 – to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. Relative to the status quo (Option 1), the provisions proposed in Option 2 ***(Preferred Alternative)*** should enhance the observers' ability to perform his/her duties in a safe manner at sea and improve communication between observers, vessel captains, and other captains engaged in the fishing operation. The proposed measures also support the more specific goals/objectives of the catch monitoring program, particularly related to developing a program that will foster support by the herring industry and others concerned about accurate accounts of catch in the fishery.

There may be some operational adjustments required by vessel operators and crew to comply with some of the new provisions; however, the proposed measures codify many of the practices that are already occurring at-sea when vessels take observers on-board. Interviews with captains and representatives/owners of herring businesses suggest that the proposed steps for improving or maximizing sampling at sea are currently a part of every herring vessels' normal operating practices, agreed upon by the fleet. To the extent that there are any vessels who do not comply, this option will make it easier to mandate these steps, thus making certain that observers on every boat have equal opportunity to fully sample the catch. The measures should improve the vessel owner/operator's understanding regarding expectations and the collection of information by observers during a fishing trip, and ensure safe working conditions for observers on all fishing vessels.

The Council supports a requirement to deploy observers on any vessel taking on fish but recognizes that this may not always be possible on multi-vessel trips. The proposed language, including "wherever/whenever possible" addresses the need for reasonable flexibility for situations that may not allow for coverage of all vessels. It may be particularly difficult to cover all vessels involved in purse seine operations if fish are pumped to multiple carriers, possibly from multiple catcher vessels. Sometimes, the vessel operators don't always know who they will provide fish to when they are at-sea, so it may not always be possible to know ahead of time every vessel on which to place an observer. The target is always to have observers on every vessel taking on fish; instances when this may not be possible would be reduced by the requirement for 100% coverage on Category A/B vessels.

Although some concerns were expressed during the Amendment 5 DEIS comment period about potential loopholes associated with requiring visual access to the net/codend or purse seine bunt, the Council believes that this requirement critical for maximizing the observer's ability to sample and document *operational discards*. During the development of Amendment 5, the Council identified several components of sampling the herring fishery at-sea that are critical to generating accurate information, two of which are sampling operational discards and slipped catch. The Council chose to address both of these components in Amendment 5. The measures proposed in this section address the sampling of operational discards and comport with recent improvements to observer sampling protocols that have been implemented for high-volume fisheries (i.e., the recently-implemented observer discard log). To the extent that the proposed measure can improve the observers' access to all of the fish in the net, the observers' ability to identify species composition of operational discards and other discarded fish may improve. This may improve estimates of bycatch/discards of non-targeted species in the herring fishery and ultimately lead to a more reliable discard estimate that can be utilized for better managing bycatch in the fishery.

3.2.3 Measures to Address Net Slippage

In Amendment 5, the Council is proposing measures to address net slippage on board all limited access Atlantic herring vessels (Categories A, B, and C). The Council's ***Preferred Alternative*** is Option 4C, as written in this document (see below).

For the purposes of Amendment 5*, slippage* is defined as:

Unobserved catch, i.e., catch that is discarded prior to being observed, sorted, sampled, and/or brought on board the fishing vessel. Slippage can include the release of fish from a codend or seine prior to completion of pumping or the release of an entire catch or bag while the catch is still in the water.

- Fish that cannot be pumped and that remain in the net at the end of pumping operations are considered to be operational discards and not slipped catch. Observer protocols include documenting fish that remain in the net in a discard log before they are released, and existing regulations require vessel operators to assist the observer in this process. Management measures are under consideration in this amendment to address this issue and improve the observers' ability to inspect nets after pumping to document operational discards.
- Discards that occur at-sea after catch brought on board and sorted are also not considered slipped catch.

3.2.3.1 Option 1: No Action

Under the no action option, no additional provisions would be implemented in Amendment 5 specifically to address net slippage.

Existing sampling requirements for herring vessels in Closed Area I would continue to apply under the no action option. These are based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80) and include (for any trip in CAI with an observer):

- A requirement to pump aboard all fish from the net for inspection and sampling by the observer.
- If the net is released for any of the reasons allowed in the rule, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.

3.2.3.2 Option 2: Require Released Catch Affidavit for Slippage Events

Under this option, vessel operators would be required to provide additional information about whether a net was partially/fully slipped, the reason for the slippage, and the estimated weight of fish that were released on any trip with slippage events when a NMFS-approved observer is on board.

This option requires that a **Released Catch Affidavit** be created for slippage events on both trawl and purse seine vessels with Category A, B, or C herring permits on all declared herring trips with a NMFS-approved observer on board, to be signed by vessel operators under penalty of perjury. The Released Catch Affidavit will contain detailed information including (1) the reason for slippage; (2) an estimate of the quantity and species composition of the slipped fish; and (3) the location and time that the slippage event occurred. When an observer is present on the vessel during a slippage event, the event would be fully documented with photographs. Released catch that is identified as Atlantic herring also should be reported as discarded herring through the herring ACL-monitoring program (IVR or VMS) as well as the VTRs.

3.2.3.3 Option 3: Closed Area I Sampling Provisions

This option would apply management measures similar to those for herring vessel access to Multispecies Closed Area I based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80). The following provisions would apply to limited access herring vessels (all gear types) on declared herring trips in all herring management areas carrying a NMFS-approved observer on board (for any trip with an observer):

- Vessels would be required to pump aboard all fish from the net for inspection and sampling by the NMFS-approved observer. Vessels that do not pump fish would be required to bring all fish aboard the vessel for inspection and sampling by the observer. Unless specific conditions are met (see below), vessels would be prohibited from releasing fish from the net, transferring fish to another vessel that is not carrying a NMFS-approved observer, or otherwise discarding fish at sea, unless the fish have first been brought aboard the vessel and made available for sampling and inspection by the observer.
- Vessels may make short test tows in the area to check the abundance of target and bycatch species without pumping the fish on board if the net is reset without releasing the contents of the test tow. In this circumstance, catch from the test tow would remain in the net and would be available to the observer to sample when the subsequent tow is pumped out.
- Fish that have not been pumped aboard may be released if the vessel operator finds that:
    1. pumping the catch could compromise the safety of the vessel;
    2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
    3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- If the net is released for any of the reasons stated above, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.

3.2.3.4 Option 4 (*Preferred Alternative* 4C): Catch Deduction (and Possible Trip Termination) for Slippage Events

The Council considered options for management measures that would apply a deduction against the herring sub-ACL in a management area if a slippage event is observed and/or may require trip termination if multiple slippage events occur in one management area. The intent of these options is to discourage slippage to the extent practicable, while still allowing for catch to be released in cases where safety is a concern or there may be gear/mechanical failure. Several related options are described below. These options would apply on any trips by limited access herring vessels carrying a NMFS-approved observer on board.

The Council's ***Preferred Alternative*** for Amendment 5, as voted at the June 19-21, 2012 meeting, is Option 4C, which does not include a catch deduction, but does include a trip termination provision after ten slippage events (by gear type and management area, see below). The rationale for the Council's ***Preferred Alternative***, including the modifications/clarifications made by the Council during final decision-making (division of slippage events by gear type and management area), is provided in the discussion below.

Option4A: Catch Deduction and Possible Trip Termination

Under this option, the following provisions would apply to limited access herring vessels (all gear types) carrying a NMFS-approved observer on board (for any trip with an observer):

For slippage events that occur if the vessel operator finds that (1) pumping the catch could compromise the safety of the vessel or (2) mechanical failure precludes bringing some or all of the catch aboard the vessel:

- It will be assumed that the herring not pumped on board will equal 100,000 lbs. of herring, to be counted as part of the catch and against the sub-ACL for that management area. Vessel operators will be responsible for reporting this catch through the quota monitoring mechanism (IVR or VMS) and their VTRs, under penalty of perjury. The slipped catch will be identified separately so that the number of slippage events per management area can be tracked and any resulting discrepancies between datasets can be more easily resolved.
- Once ten slippage events are observed in a particular management area, each additional slippage event for reasons specified in (1) and (2) above will cause trip termination and the vessel will be required to return to port.

Option4B: Closed Area I Provisions with Catch Deduction and Possible Trip Termination

This option would apply management measures similar to those for herring vessel access to Multispecies Closed Area I based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80). The following provisions would apply to limited access herring vessels (all gear types) on declared herring trips in all herring management areas carrying a NMFS-approved observer on board (for any trip with an observer):

- Vessels would be required to pump aboard all fish from the net for inspection and sampling by the observer. Vessels that do not pump fish would be required to bring all fish aboard the vessel for inspection and sampling by the observer. Unless specific conditions are met (see below), vessels would be prohibited from releasing fish from the net, transferring fish to another vessel that is not carrying a NMFS-approved observer, or otherwise discarding fish at sea, unless the fish have first been brought aboard the vessel and made available for sampling and inspection by the observer.
- Vessels may make short test tows in the area to check the abundance of target and bycatch species without pumping the fish on board if the net is reset without releasing the contents of the test tow. In this circumstance, catch from the test tow would remain in the net and would be available to the observer to sample when the subsequent tow is pumped out.
- Fish that have not been pumped aboard may be released if the vessel operator finds that:
    1. pumping the catch could compromise the safety of the vessel;
    2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
    3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- If the net is released for any of the reasons stated above, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.

For slippage events that occur if the vessel operator finds that (1) pumping the catch could compromise the safety of the vessel or (2) mechanical failure precludes bringing some or all of the catch aboard the vessel:

- It will be assumed that the herring not pumped on board will equal 100,000 lbs. of herring, to be counted as part of the catch and against the sub-ACL for that management area. Vessel operators will be responsible for reporting this catch through the quota monitoring mechanism (IVR or VMS) and their VTRs, under penalty of perjury. The slipped catch will be identified separately so that the number of slippage events per management area can be tracked and any resulting discrepancies between datasets can be more easily resolved.
- Once ten slippage events are observed in a particular management area, each additional slippage event for reasons specified in (1) and (2) above will result in trip termination and the vessel will be required to return to port.

Option 4C: : Full Sampling with Trip Termination After Ten Slippage Events (Preferred Alternative)

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

Under this option, the following provisions would apply to limited access herring vessels (all gear types) carrying a NMFS-approved observer on board (for any trip with an observer):

- Vessels would be required to pump aboard all fish from the net for inspection and sampling by the observer. Vessels that do not pump fish would be required to bring all fish aboard the vessel for inspection and sampling by the observer. Unless specific conditions are met (see below), vessels would be prohibited from releasing fish from the net, transferring fish to another vessel that is not carrying a NMFS-approved observer, or otherwise discarding fish at sea, unless the fish have first been brought aboard the vessel and made available for sampling and inspection by the observer.
- Vessels may make short test tows in the area to check the abundance of target and bycatch species without pumping or bringing the fish on board if the net is reset without releasing the contents of the test tow. In this circumstance, catch from the test tow would remain in the net and would be available to the observer to sample when the subsequent tow is pumped out or all fish are brought aboard.
- Fish that have not been pumped or brought aboard may be released if the vessel operator finds that:
  1. pumping the catch or bringing all fish aboard could compromise the safety of the vessel;
  2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
  3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- If the net is released for any of the reasons stated above, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.
- Slippage is defined in this amendment (see previous section) and includes fish released from the net other than operational discards, as characterized and documented by the NMFS-approved observer. Under this option, NMFS would track the number of slippage events by gear type (midwater trawl, purse seine, bottom trawl) observed in each management area. Once ten (10) slippage events occur in any management area by one of the three gear types, each additional slippage event observed by a herring vessel using that gear will result in trip termination and the vessel will be required to return to port. **Slippage events that are caused by spiny dogfish (#3 above) would not be counted towards the trip termination thresholds.**

Option4D: : Closed Area I Provisions with Trip Termination Only (5 Events)

Option 4D is the same as Option 4C except trip termination would result once five (5) slippage events occur in any management area.

Rationale for Preferred Alternative 4C: The measures proposed to address slippage, including the ***Preferred Alternative***, directly relate to the first objective of Amendment 5: to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. Minimizing slippage events and better documenting slipped catch may improve estimates of bycatch in the fishery. To the extent that the amount and species composition of slipped catch can be sampled and/or estimated, catch monitoring will be enhanced. To the extent that slippage events can be reduced/eliminated, bycatch can be further minimized. The measures under consideration in Amendment 5 to address net slippage also relate to the first two goals of the catch monitoring program (and some of the related objectives, identified below) that will ultimately be adopted in this amendment:

1. To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species caught in the herring fishery;

2. Develop a program providing catch of herring and bycatch species that will foster support by the herring industry and others concerned about accurate accounts of catch and bycatch, i.e., a well-designed, credible program;

- Avoid prohibitive and unrealistic demands and requirements for those involved in the fishery, i.e., processors and fishermen using single and paired midwater trawls, bottom trawls, purse seines, weirs, stop seines, and any other gear capable of directing on herring;
- Improve communication and collaboration with herring vessels and processors to promote constructive dialogue, trust, better understanding of bycatch issues, and ways to reduce discards;
- Eliminate reliance on self-reported catch estimates;

This measure also specifically addresses National Standard 9 of the MSA (minimize bycatch and bycatch mortality, to the extent practicable – see Section 7.0 for more discussion).

Net slippage has been identified during the development of Amendment 5 as a significant concern with respect to maximizing sampling in the directed herring fishery and generating accurate/precise estimates of the catch of herring as well as other species. Many stakeholders expressed support for measures to address net slippage in Amendment 5, suggesting that implementing these measures would further ensure that there is accountability for all catch in the fishery. The Council considered many approaches to addressing and discouraging net slippage in Amendment 5; discussion of some of the alternatives considered but rejected can be found in Section 4.4 of this document. Ultimately, the Council proposed a range of options in the Draft EIS that were based, in part, on the Closed Area 1 sampling provisions that were implemented by NMFS during the development of Amendment 5. The sampling provisions implemented in Closed Area I (CA I) appear to have been successful in reducing slippage events to date, so the Council developed the Preferred Alternative based on the CA I provisions, with some modifications to allow for the measures to be applied throughout the fishery, on vessels using gear other than midwater trawl gear. Support for trip termination measures relates to accountability, as well as implementing a deterrent to discourage inappropriate use of the slippage exceptions (safety and mechanical failure).

The success of the Closed Area I sampling program, to date, is one of the primary reasons that the Council is proposing similar provisions throughout the fishery (modified accordingly to address the diversity of the fishery and the use of multiple gear types). According to the Amendment 5 DEIS, there were 99 hauls observed in Closed Area I during 2010, under the new provisions for sampling catch, implemented in November 2009 (note that only midwater trawl vessels have operated under this rule in Closed Area I). There were no slippage events observed on these 99 hauls, and consequently no Released Catch Affidavits were submitted from the Closed Area I fishery in 2010. There appears to have been one released catch event (estimated 1,500 pounds) on a haul that ended (but did not begin) in Closed Area I. In 2011, there were 28 hauls observed in the Closed Area I from vessels on declared Atlantic herring trips. These hauls represent less than three (3) vessels fishing, and therefore, the specific details cannot be

released due to confidentiality restrictions. There were no partial or full slippage events documented in Closed Area I during 2011. There were 313 observed trips in all Atlantic Herring Management areas (trips defined by gear type and include purse seine and paired/single midwater trawl) in 2011, resulting in a total of 723 associated observed hauls.

The Council adopted the ***Preferred Alternative*** at the June 2012 meeting, with modifications to count slippage events against trip termination thresholds by gear type and management area. This is consistent with several comments received on the Amendment 5 DEIS expressing support for a hybrid approach that would establish trip termination provisions by fleet sector and/or management area, versus a fleet-wide allowance for slippage events. The Council considered these comments/suggestions and modified the ***Preferred Alternative*** accordingly. The intent is to reduce negative impacts of trip termination provisions on vessels that may not have contributed to the need for trip termination (i.e., vessels that did not have slippage events count towards the threshold but must terminate trips if they do so after the threshold is reached). This addresses perceptions about fairness as well as the need to mitigate negative impacts of a measure that is designed primarily to serve as a backstop.

Information regarding slippage events by gear type and management area is provided in Section 6.3.2.1 of this document. The Council weighed available slippage data and comments provided by stakeholders when selecting the final measures and proposing the gear-specific and area-specific thresholds. Given the buffer against trip termination provided by the slippage allowance by gear and area, and given the success to date of the CAI sampling provisions, the Council believes that the ***Preferred Alternative*** provides a reasonable balance that will adequately deter slippage events across the fishery without unduly penalizing the fleet or individual vessels.

3.2.4 Maximized Retention Alternative (Experimental Fishery)

The Council considered an alternative to require maximized retention (MR) of catch through an experimental fishery when NMFS-approved observers are on board Atlantic herring limited access vessels.

3.2.4.1 Alternative 1: No Action *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 2012 NEFMC Meeting.

Under the no action alternative, no provisions would be implemented in Amendment 5 to evaluate maximized retention in the herring fishery. Herring vessels would continue to operate under the regulations and possession limits for any fisheries for which they possess permits. Other measures to address at-sea monitoring (described in other sections of this document) may be implemented in Amendment 5 even if no action is taken regarding MR.

Rationale: During the development of Amendment 5, the Council considered several alternatives to require maximized retention in the Atlantic herring fishery. Council staff produced a detailed white paper during the development of Amendment 5, entitled *Case Studies in Maximized Retention and Monitoring for the New England Herring Fishery*. This paper formed the basis of discussion of possible alternatives to require MR in the herring fishery. Several alternatives were considered and ultimately rejected by the Council in Amendment 5 (see Section 4.0 of this document for a discussion of measures considered but rejected).

While implementing maximized retention across the entire herring fishery did not appear to be practicable in Amendment 5, the Council continued to consider an alternative for an experimental fishery, to be administered by NMFS following the implementation of Amendment 5. However, many of the challenges associated with the other MR options (addressing the species to which the maximized retention program would apply, how non-permitted/unmarketable landings would be handled, how compliance with MR provisions would be verified, and whether or not the MR program would be phased-in to the fishery) still existed under an experimental fishery alternative. Moreover, during the comment period on the Amendment 5 DEIS, there was not much support expressed for implementing a MR experimental fishery alternative in Amendment 5. The Council supports the Herring PDT's advice with respect to the options for maximized retention in Amendment 5 (see Herring PDT Reports and record for Amendment 5 development) and agrees that the same objectives can be achieved through other measures to address catch monitoring, which are the focus of the action proposed in Amendment 5. The Council may revisit this issue in a future amendment to the Herring FMP.

3.2.4.2 Alternative 2: Evaluate Maximized Retention through the Annual Issuance of Exempted Fishing Permits

Under this alternative, the experimental fishery process would be utilized to determine whether maximized retention is appropriate for the Atlantic herring fishery, and if so, which species should be part of the maximized retention program and which FMPs should be amended to allow for long-term implementation of the program.

Under this alternative, for four years following the implementation of Amendment 5, Category A, B, and C Atlantic herring vessels would be issued an Exempted Experimental Fishing Permit (EFP) by the Sustainable Fisheries Division (SFD) at NERO as part of the annual herring permit renewal process. The EFP would provide the regulatory relief necessary to allow the currently non-permitted landings to take place when the vessels are required to comply with maximized retention provisions. Regulations implementing the details of the experimental fishery would address the handling of unwanted/unmarketable catch and provisions regarding the counting and sale of such catch.

During the EFP years (four years), vessels would be required to comply with the maximized retention provisions specified in this section on any trip with a NMFS-approved observer on board.

3.2.4.2.1 General Provisions

- For the first four years after implementation of Amendment 5, limited access Category A, B, and C vessels would be required to obtain an exempted experimental fishery permit (EFP) to fish for Atlantic herring in any management area(s). Conditions of the EFP include a requirement to retain all species identified for maximized retention on any trip with a NEFOP or NMFS-certified observer on board (discarding would be prohibited on observed trips).
- The EFP would allow the herring vessel to keep all catch of the species identified for the maximized retention program on observed trips only, including catch above trip limits/quotas for the maximized retention species. The sale of the non-permitted species (and landings above the possession limit/quota) caught by herring limited access vessels for *human consumption* would be prohibited on maximized retention trips. Atlantic herring dealers and processors would also be prohibited from purchasing these fish to be sold for human consumption. This does not apply to sale for use as bait because herring catches that are landed for sale as bait are generally offloaded by pumping the fish from the vessel hold into tanker trucks. It is not possible to require all such landings to be culled and sorted and would be inequitable to make downstream purchasers of such bait legally liable for the presence of these fish in their bait.
- All observed trips in the fishery would become maximized retention trips and would form a "study group" for the fishery. Catch/landings data would be collected and documented by observers, as well as by vessels based on the reporting and monitoring provisions associated with the vessels' permits and specified in this amendment.
- During Year 3, the Herring PDT would begin to analyze the data collected by observers through the maximized retention program and: evaluate the strengths/weaknesses and costs/benefits of a maximized retention program; determine the need for a long-term maximized retention program in the herring fishery; evaluate the appropriateness of each species selected for maximized retention; and develop recommendations for the Herring Committee/Council regarding future regulatory action. The technical review and ensuing discussion regarding the need for management action would likely be time-consuming and would occur throughout most of the third year of the program as data from the experimental program continued to be collected.

- During Year 4, the Council would receive input from the herring industry and advisors and would review the Herring PDT's recommendations to determine whether or not a long-term maximized retention program should be established for the Atlantic herring fishery. The experimental fishery for maximized retention and the EFP requirements and provisions would expire after four years regardless of the determination. Other catch monitoring and reporting requirements implemented in this amendment would continue to be effective.
- If the Council supports a long-term maximized retention program, then development of the corresponding management actions would begin during Year 4 of the experimental fishery program with the intention of implementing the program as soon as all regulatory mechanisms are in place. This includes an amendment to the Herring FMP to design the program and implement the specific requirements as well as amendments to all other relevant species FMPs in the Northeast Region (NEFMC, MAFMC, and ASMFC) to authorize the catch/landing of the species in the herring fishery (including allowances for landings above possession limits and/or quotas).

3.2.4.2.2 Options for Exemption to Maximized Retention Provisions

There may be instances that a vessel cannot pump all fish aboard. The Council could consider incorporating exemptions into the EFP provisions that allow a vessel to release some catch under certain circumstances, and possibly with specific consequences. Any or all of the following provisions could be incorporated into the EFP for maximized retention:

- Fish that have not been pumped aboard may be released if the vessel operator finds that:
  1. pumping the catch could compromise the safety of the vessel;
  2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
  3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- A Released Catch Affidavit would be required for slippage events on both trawl and purse seine vessels, to be signed by vessel operators under penalty of perjury. The Released Catch Affidavit would contain detailed information including (1) the reason for slippage; (2) an estimate of the quantity and species composition of the slipped fish; and (3) the location and time that the slippage event occurred. Since an observer will be present on the vessel when the maximized retention provisions apply, slippage events would require an affidavit and would be fully documented by the observer with photographs.

3.3 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

The Council is considering several management measures to address river herring (alewife and blueback herring) bycatch in Amendment 5. Each of these alternatives relates to a general management goal. While there may be some overlap and flexibility in combining management measures to achieve more than one of these goals, a range of options is being considered to achieve the goal identified within each of these alternatives.

The MSA defines "bycatch" as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidental catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. Due to the high-volume nature of the Atlantic herring fishery, certain species, including river herring, shad, and some groundfish, may be either discarded or retained and/or sold when harvested during the Atlantic herring fishery. Therefore, for the purpose of this document, the terms "bycatch" and "incidental catch" are sometimes used interchangeably, and measures to "minimize bycatch to the extent practicable" refers to catch of species that may be both bycatch and incidental catch.

3.3.1 Alternative 1: No Action

Under this alternative, no additional management measures would be implemented in Amendment 5 to address river herring bycatch. The catch monitoring provisions and other measures established in the Herring FMP and in this amendment would continue to apply.

3.3.2 Alternative 2: River Herring Monitoring/Avoidance *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting (in combination with Option 4, discussed in the following subsections).

The management goal associated with this alternative is to monitor river herring (alewife and blueback herring) bycatch and encourage bycatch avoidance. Under this alternative, additional management measures would apply during certain times and in certain areas where river herring encounters with the herring fishery were observed between 2005 and 2009 (areas are defined below). The intent of the additional management measures would be to increase sampling (above and beyond the requirements of the Amendment 5 catch monitoring program) and closely monitor the catch of river herring by the Atlantic herring fleet (defined by permit category). The long-term goal is to adopt river herring bycatch avoidance strategies in the times/areas where interactions with the herring fishery are observed/anticipated.

As noted in Section 3.2.1.2 of this document (Catch Monitoring At-Sea), the measures that would apply to the proposed River Herring Monitoring/Avoidance Areas identified in Amendment 5 would include 100% observer coverage on Category A and B vessels. In addition, management measures to address net slippage (full sampling provisions, Section 3.2.3.4 Option 4C) would apply to all limited access herring vessels fishing in the proposed River Herring Monitoring/Avoidance Areas.

3.3.2.1 Identification of Monitoring/Avoidance Areas (Alternative 2)

The areas identified in this alternative would be considered River Herring Monitoring/Avoidance Areas. In Amendment 5, the Monitoring/Avoidance Areas would be identified bimonthly as the quarter degree squares with at least one observed tow of river herring catch greater than 40 pounds, using 2005-2009 Northeast Fisheries Observer Program data from trips with greater than 2,000 pounds of kept Atlantic herring (Figure 2 – Figure 7). These areas can be modified in the future through a Herring FMP amendment, framework adjustment, or the herring fishery specifications process (see Section 3.3.4).

Figure 2 Alternative 2: River Herring Monitoring/Avoidance Areas January – February

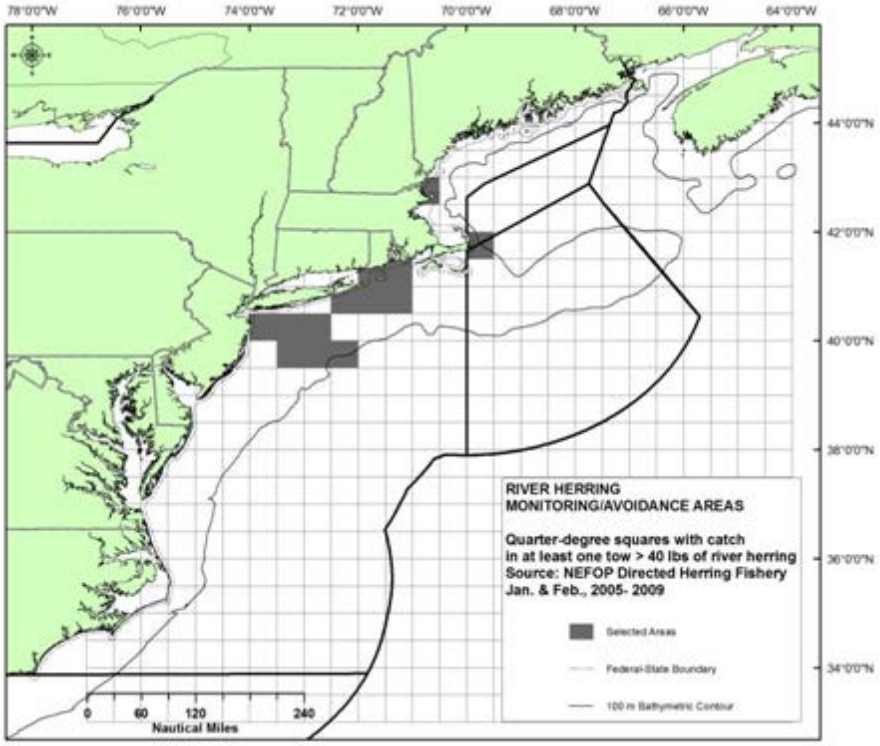


Figure 3 Alternative 2: River Herring Monitoring/Avoidance Areas March – April

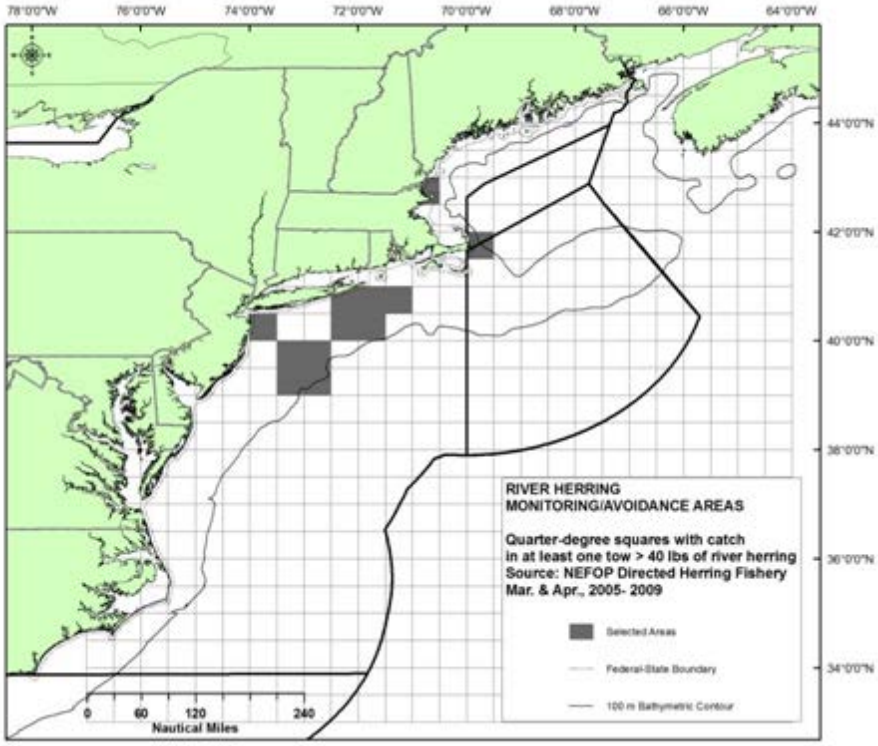


Figure 4 Alternative 2: River Herring Monitoring/Avoidance Areas May – June

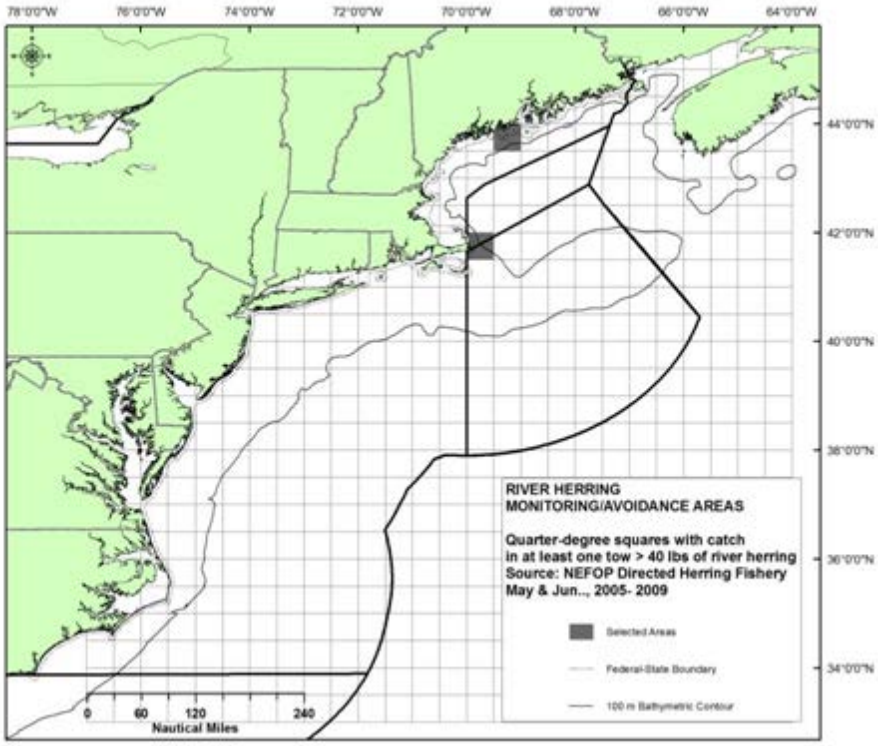


Figure 5 Alternative 2: River Herring Monitoring/Avoidance Areas July – August

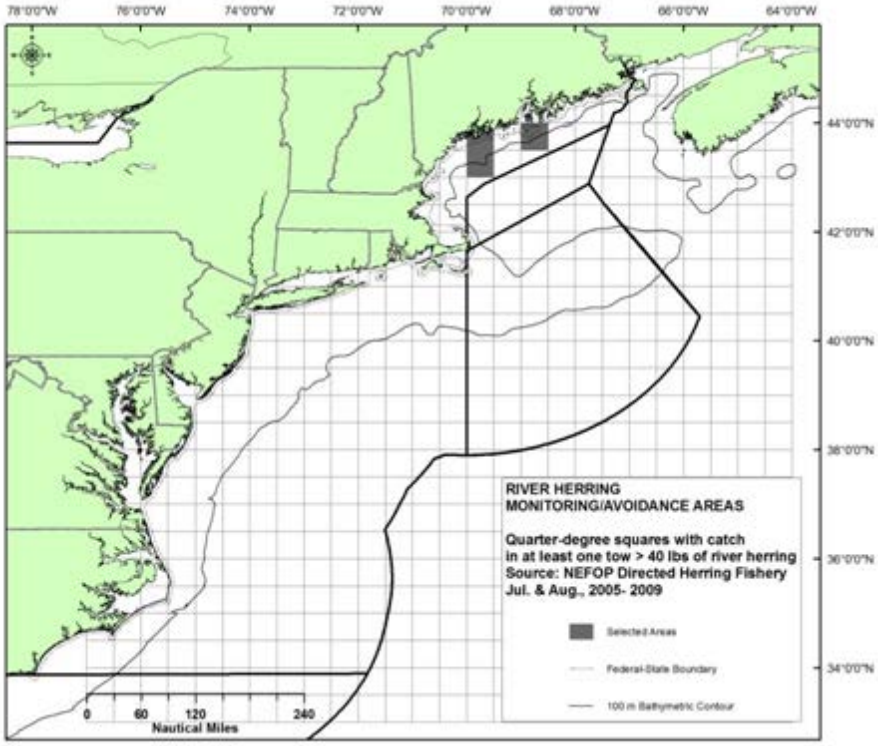


Figure 6 Alternative 2: River Herring Monitoring/Avoidance Areas September – October

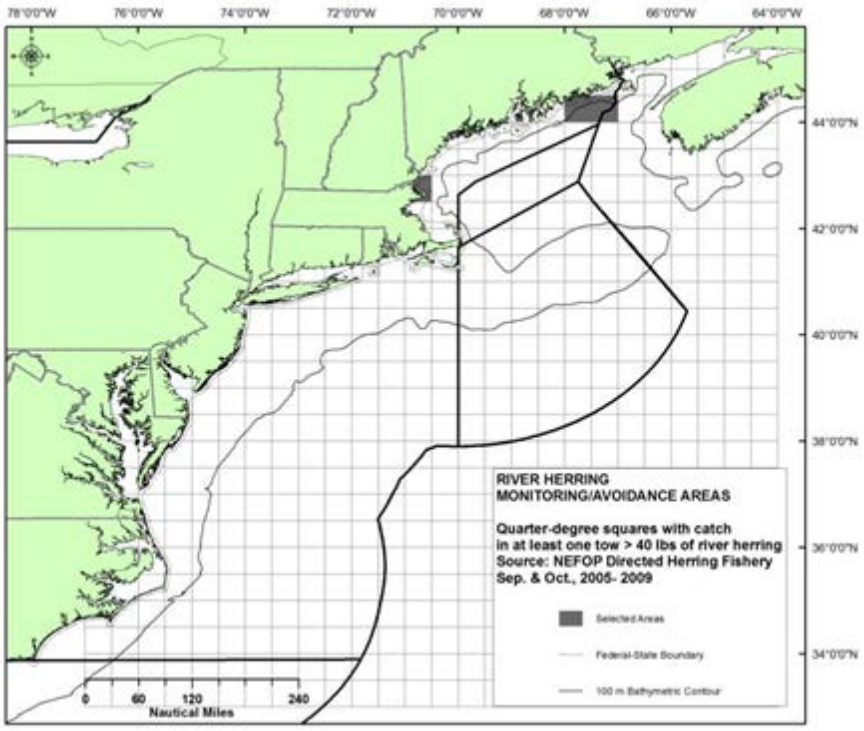
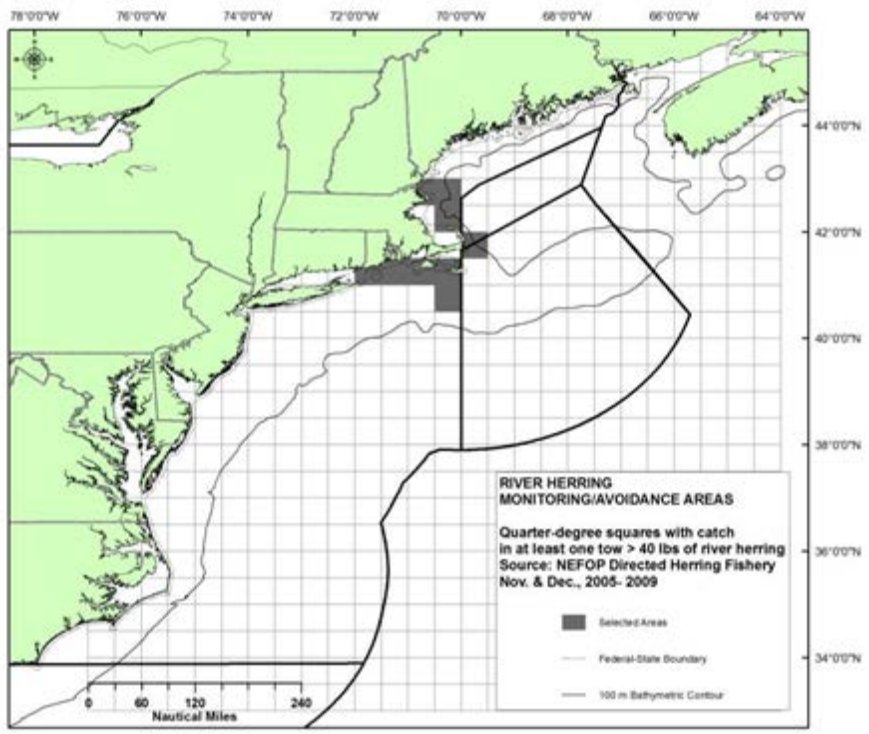


Figure 7 Alternative 2: River Herring Monitoring/Avoidance Areas November – December



Rationale: The management measures under consideration in Amendment 5 to address river herring bycatch relate to the overall goal of Amendment 5: to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These measures also directly address the first three objectives of Amendment 5: (1) to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery; (2) to implement other management measures as necessary to ensure compliance with the MSA; and (3) to implement management measures to address bycatch in the Atlantic herring fishery. The measures proposed to address river herring bycatch are also likely to enhance monitoring across the fishery and particularly in areas where river herring encounters may be expected and may therefore address the more specific goals and objectives of the Amendment 5 catch monitoring program. Moreover, the measures under consideration directly address MSA National Standard 9 (bycatch), with particular focus on river herring, a species of significant concern in recent years.

The goal that the Council adopted for Amendment 5 is *river herring monitoring and avoidance*. The proposed River Herring Monitoring/Avoidance Areas are based on an extensive analysis performed by the Herring PDT, in consultation with the Herring Committee, Advisory Panel, and Council, during the development of Amendment 5. The details of the alternatives considered and the analyses provided by the Herring PDT are provided in Appendices IV, V, VI, and VII of this document (Volume II). Monitoring and avoidance was selected as the goal specific to river herring bycatch in this amendment for several reasons. First, this management goal relates well to the overall goal of the amendment, which is to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the MSA. Monitoring 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. Second, this goal promotes cooperation with the industry and acknowledges the need to better understand bycatch

problems in order to develop effective solutions. The Council's selection of management measures to apply to the proposed River Herring Monitoring/Avoidance Areas (Option 4 below) supports this notion as well. Third, this approach is likely to be more effective at this time, given the available information about river herring stock distribution, stock status, and the ability of specific management measures to impact the resource. Information presented to the Council during the development of Amendment 5 (and provided in this document and its appendices) suggests that little is known about the impact of river herring bycatch in the herring fishery on the river herring resource. Moreover, the impacts of area closures (like those proposed under Alternative 3) on the river herring resource are not possible to predict at this time; perhaps even more uncertain is the potential for bycatch to increase outside small areas proposed for seasonal closure. In turn, the Council determined that the most effective measures implemented in Amendment 5 to address river herring bycatch would be those that increase catch monitoring and bycatch accounting, and promote cooperative efforts with the industry to minimize bycatch to the extent practicable.

3.3.2.2 Alternative 2: Management Options Under Consideration (Monitoring/Avoidance)

3.3.2.2.1 Option 1: 100% Observer Coverage

This option would require 100% observer coverage on any trips in the River Herring Monitoring/Avoidance Areas identified in this alternative. Atlantic herring vessels subject to this measure would be required to carry a NMFS-approved observer on any trip where fishing may occur in the River Herring Monitoring/Avoidance Areas.

Sub-Option A: **This option applies to limited access herring vessels only – Categories A/B/C when on a declared herring trip**. Vessels would be required to indicate their intention to fish in the River Herring Monitoring/Avoidance Areas when scheduling a NMFS-approved observer through the pre-trip notification system (see Section 3.1.4 of this document for a description of options under consideration to address trip notification requirements). To ensure 100% coverage, these vessels would be prohibited from fishing in the River Herring Monitoring/Avoidance Areas without a NMFS-approved observer on board.

Sub-Option B: **This option applies to <u>all</u> herring vessels – Limited Access Categories A/B/ C when on a declared herring trip, as well as Open Access Category D.** All herring vessels would be required to indicate their intention to fish in the River Herring Monitoring/Avoidance Areas when scheduling a NMFS-approved observer through the pre-trip notification system. Category D vessels would only be required to use the pre-trip notification system to schedule an observer if they intend to fish in a River herring Monitoring/Avoidance Area. To ensure 100% coverage, all herring vessels would be prohibited from fishing in the River Herring Monitoring/Avoidance Areas without a NMFS-approved observer on board.

3.3.2.2.2 Option 2: Apply Closed Area I Sampling Provisions

This option would apply management measures in River Herring Monitoring/Avoidance Areas similar to those for herring vessel access to Multispecies Closed Area I based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80). Under this option, the following provisions would apply to Atlantic herring vessels subject to this measure when fishing in the River Herring Monitoring/Avoidance Areas with a NMFS-approved observer on board:

- When fishing in a River Herring Monitoring/Avoidance Area with a NMFS-approved observer on board, vessels would be required to pump aboard all fish from the net for inspection and sampling by the observer. Vessels that do not pump fish would be required to bring all fish aboard the vessel for inspection and sampling by the observer. Unless specific conditions are met (see below), vessels would be prohibited from releasing fish from the net, transferring fish to another vessel that is not carrying a NMFS-approved observer, or otherwise discarding fish at sea, unless the fish have first been brought aboard the vessel and made available for sampling and inspection by the NMFS-approved observer.
- Vessels may make short test tows in the area to check the abundance of target and bycatch species without pumping the fish on board if the net is reset without releasing the contents of the test tow. In this circumstance, catch from the test tow would remain in the net and would be available to the observer to sample when the subsequent tow is pumped out.
- Fish that have not been pumped aboard may be released if the vessel operator finds that:
    1. pumping the catch could compromise the safety of the vessel;
    2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
    3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- If the net is released for any of the reasons stated above, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.
- Following the release of the net for one of the three exemptions specified above, the vessel would be required to exit the River Herring Monitoring/Avoidance Area. The vessel may continue to fish but may not fish in the River Herring Monitoring/Avoidance Areas for the remainder of the trip.

Sub-Option A – Require 100% Observer Coverage: Atlantic herring vessels subject to this measure would be required to carry a NMFS-approved observer on any trip where fishing may occur in the River Herring Monitoring/Avoidance Areas. Vessels would be required to indicate their intention to fish in the River Herring Monitoring/Avoidance Areas when scheduling a NMFS-approved observer through the pre-trip notification system. To ensure 100% coverage, vessels would be prohibited from fishing in the River Herring Monitoring/Avoidance Areas without a NMFS-approved observer on board.

Sub-Option B – Less Than 100% Observer Coverage: Under this sub-option, observer coverage would be distributed on limited access herring vessels based on the provisions in Amendment 5 (see alternatives in Section 3.2.1). Atlantic herring vessels subject to this measure would be required to indicate their intention to fish in the River Herring Monitoring/Avoidance Areas when scheduling a NMFS-approved observer through the pre-trip notification system but would not be prohibited from fishing in the River Herring Monitoring Areas if a NMFS-approved observer is not deployed.

Sub-Option C: **This option applies to limited access herring vessels – Categories A/B/C when on a declared herring trip.**

Sub-Option D: **This option applies to all herring vessels – Categories A/B/C when on a declared herring trip, as well as Category D.**

3.3.2.2.3 Option 3: Trigger-Based Monitoring Approach

This option would apply additional management measures in River Herring Monitoring/Avoidance Areas when a specified river herring catch trigger is reached. The catch triggers apply to three general areas – Statistical Area 521 (Cape Cod, CC), the Gulf of Maine (GOM), and southern New England (SNE) – see Figure 8 below. When the catch trigger in a specified area(s) is reached, then one of the monitoring options described above (Option 1 or Option 2) will apply to the Monitoring/Avoidance Areas within that geographic area where the trigger is reached.

Sub-Options: River Herring Catch Triggers

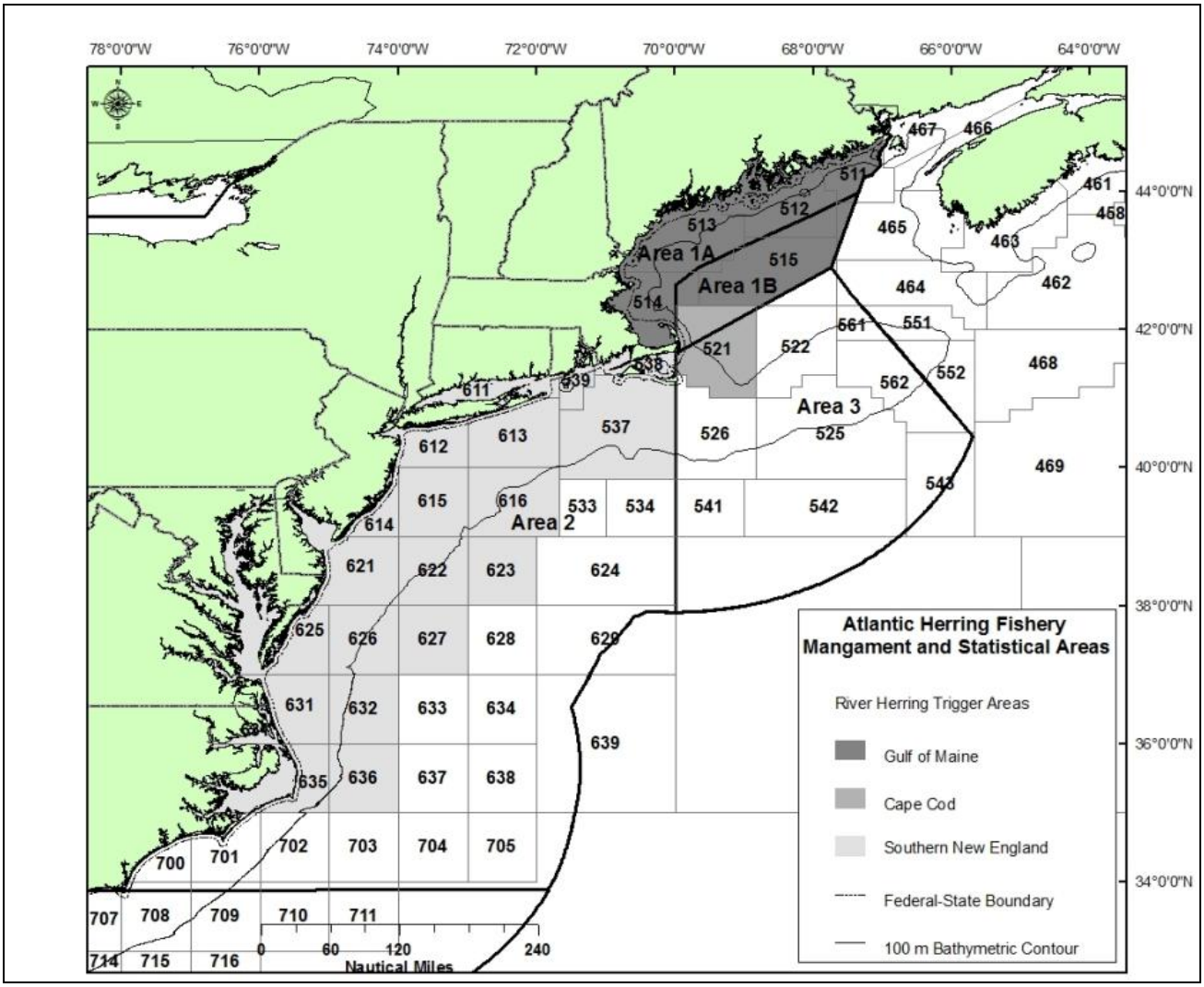
Several sub-options are under consideration for specifying the river herring catch triggers in each of the geographic areas identified in Figure 8. The sub-options are based on the Herring PDT's work to generate the best estimates of river herring removals in recent years (see Table 4 in Herring PDT Discussion Paper: *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery* in Appendix VII (Volume II)) and are summarized below in Table 4. The sub-options include river herring catch estimates based on the maximum, median, and mean annual estimate of river herring catch expanded from observer data from 2005-2009.

Estimates of river herring catch in thousands of pounds (± 2 standard errors) were calculated by the Herring PDT using *Method 2* stratified by gear (midwater trawls, bottom trawls, and purse seines), area (Gulf of Maine (GOM, Statistical Areas 511-514), Cape Cod (CC, Statistical Area 521), and Southern New England (SNE)), and year (2005, 2006, 2007, 2008, and 2009). *Method 2* is the Simple Expansion Method (see SBRM 5.4.2.3. Simple Expansion Method: mean discard per trip, pp 143) modified to include both kept and discarded river herring. These estimates were summed across gear types for each year and area combination. Then the maximum, median, and mean estimates of river herring catch were selected to form the sub-options (Table 4).

Table 4 Sub-Options for River Herring Catch Triggers (Pounds)

Area	SUB-OPTIONS		
	3A (Max)	3B (Median)	3C (Mean)
CC	1,159,700	93,400	269,600
GOM	294,000	92,400	127,100
SNE	729,500	585,000	478,500

Figure 8 River Herring Catch Trigger Areas (Shaded)



Monitoring the River Herring Catch Triggers – Reporting Options

During the fishing year, river herring catch in each of the trigger areas identified above will be monitored and estimated using observer data from all trips by herring vessels subject to this rule unless the vessel has declared out of the fishery (DOF) through VMS. Observed estimates of river herring catch will be expanded to an estimate of total river herring catch in each of the trigger areas. The estimation procedure will be developed by the NERO, in cooperation with the NEFSC and Council staff, and through consultation with the Council. The final calculation process will be provided on the NERO web page. Area-specific river herring catch estimates will be published on the NERO web page regularly.

Reporting Option 1: Report Total Catch by Trigger Area

In addition to reporting herring by herring management area through the ACL-monitoring system, herring vessels subject to this rule must report total catch (kept and discarded) by river herring catch trigger area so that the appropriate expansions can be made from the observed catch in those areas. For the purposes of this requirement, the **river herring catch trigger areas** are defined as the following statistical areas:

- Gulf of Maine (GOM) – Areas 511, 512, 513, 514, 515, 464, 465 (same as modified GOM haddock stock area established in Framework 46)
- Cape Cod (CC) – Area 521
- Southern New England (SNE) – Areas 537, 538, 539, 611, 612, 613, 614, 615, 616, 621, 622, 623, 625, 626, 627, 631, 632, 635, 636

Reporting Option 1 – Example Catch Report

This report is required by all limited access herring vessels on all declared herring trips. For each day of a declared trip, this report must be submitted by 9 AM the following day. Negative reports (0 lb) must be submitted when no fish were caught.

Note: VTR serial number must be the same number reported to the seafood dealer receiving the landings at the end of the trip. If you use multiple pages of the VTR on the trip, record the serial number from the first VTR page used.

Vessel Trip Report (VTR) Serial Number: _____
Date fish caught: Month (01-12) _____
Day (01-31) _____
Gear used to fish: (MWT, PS, BT) _____

SPECIES	AREA 1A	AREA 1B	AREA 2	AREA 3
Herring Kept (lb)	_____	_____	_____	_____
Herring Discarded (lb)	_____	_____	_____	_____

==========

All Fish Kept (lb)	GOM RH Area	CC RH Area	SNE RH Area
	_____	_____	_____
All Fish Discarded (lb)	GOM RH Area	CC RH Area	SNE RH Area
	_____	_____	_____

Note: Reporting by river herring area is required for all limited access vessels. Include total lb of all herring and non-herring. GOM RH Area includes Stat Areas 464, 465, and 511 thru 515. CC RH Area is Stat Area 521. SNE RH Area includes Stat Areas 537, 538, 539, 611, 612, 613, 614, 615, 616, 621, 622, 623, 625, 626, 627, 631, 632, 635, and 636.

All Fish Kept (lb)	GOM Haddock Area	GB Haddock Area
	_____	_____

Note: Reporting by haddock area is only required for vessels using mid-water trawl gear in Areas 1A, 1B, and/or 3. Include total lbs of all herring and non-herring.

GOM Haddock Area includes Stat Areas 464, 465, and 511 thru 515.
GB Haddock Area includes Stat Areas 521, 522, 525, 526, 561, and 562.

Reporting Option 2: Report Total Catch by Statistical Area

Under this option, in addition to reporting herring by herring management area through the ACL-monitoring system, herring vessels subject to this rule must report total catch (kept and discarded) by statistical area so that the appropriate expansions can be made from the observed catch in those areas to monitor both the haddock catch caps (Framework 46) and any river herring catch trigger areas that may be established.

Reporting Option 2 – Example Catch Report

This report (example for Reporting Option 2) is required by all limited access herring vessels on all declared herring trips. For each day of a declared trip, this report must be submitted by 9 AM the following day. Negative reports (0 lb) must be submitted when no fish were caught.

Note: VTR serial number must be the same number reported to the seafood dealer receiving the landings at the end of the trip. If you use multiple pages of the VTR on the trip, record the serial number from the first VTR page used.

Vessel Trip Report (VTR) Serial Number: _____
Date fish caught: Month (01-12) _____
Day (01-31) _____
Gear used to fish: (MWT, PS, BT) _____

SPECIES	AREA 1A	AREA 1B	AREA 2	AREA 3
Herring kept (lbs)	_____	_____	_____	_____
Herring discarded (lbs)	_____	_____	_____	_____

Report all fish kept (herring and non-herring species) and the Stat Area in which the fish were caught. If fish were caught in multiple Stat Areas in one day, report the fish kept (lbs) in each Stat Area.

All Fish Kept (lbs) _____ Stat/Chart Area ____

All Fish Kept (lbs) _____ Stat/Chart Area ____

All Fish Kept (lbs) _____ Stat/Chart Area ____

Management Measures That Apply When Trigger is Reached

When the river herring catch trigger in a specified area(s) is reached, then one of the monitoring options described above (Option 1 in Section 3.3.2.2.1 - 100% observer coverage, or Option 2 in Section 3.3.2.2.2 – Closed Area I sampling provisions) would apply to the River Herring Monitoring/Avoidance Areas within that geographic area where the trigger is reached. The additional monitoring measures would apply to all Monitoring/Avoidance Areas within the trigger area(s) for the remainder of the fishing year. Figure 9 – Figure 14 below illustrate which Monitoring/Avoidance Areas are associated with the river herring catch trigger areas.

For example, if the Gulf of Maine river herring catch trigger is reached in March, then the shaded quarter degree squares in the inshore Gulf of Maine shown in Figure 10 – Figure 14 would be subjected to increased monitoring/sampling during the months identified in the figures for the remainder of that fishing year. Similarly, if the southern New England river herring catch trigger is reached in August, then the shaded squares shown in the southern New England trigger area would be subject to increased monitoring during November and December (Figure 14– no closures in the southern New England area would occur during September/October as shown in Figure 13).

Figure 9 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for January – February

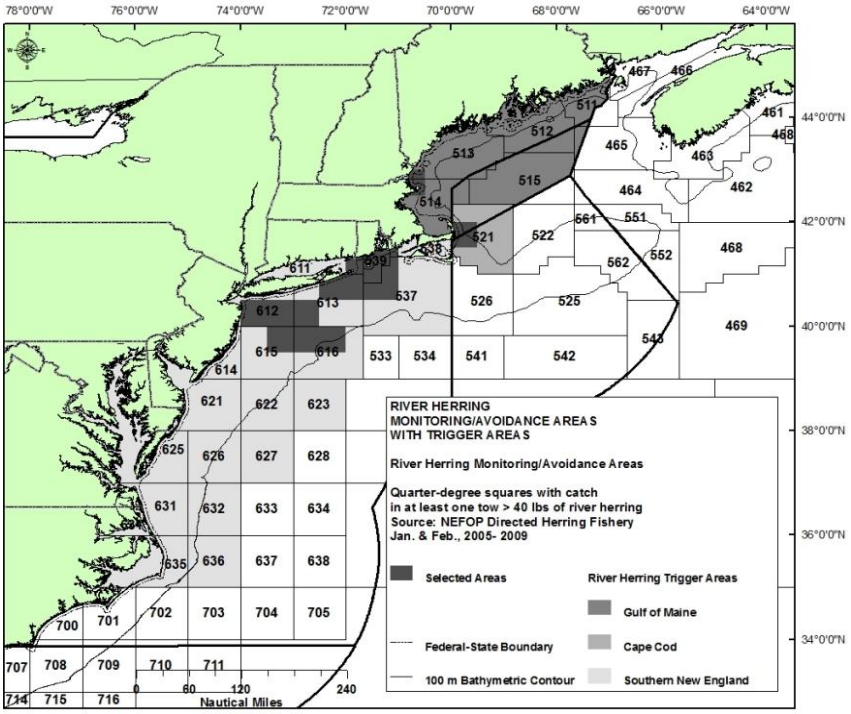


Figure 10 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for March – April

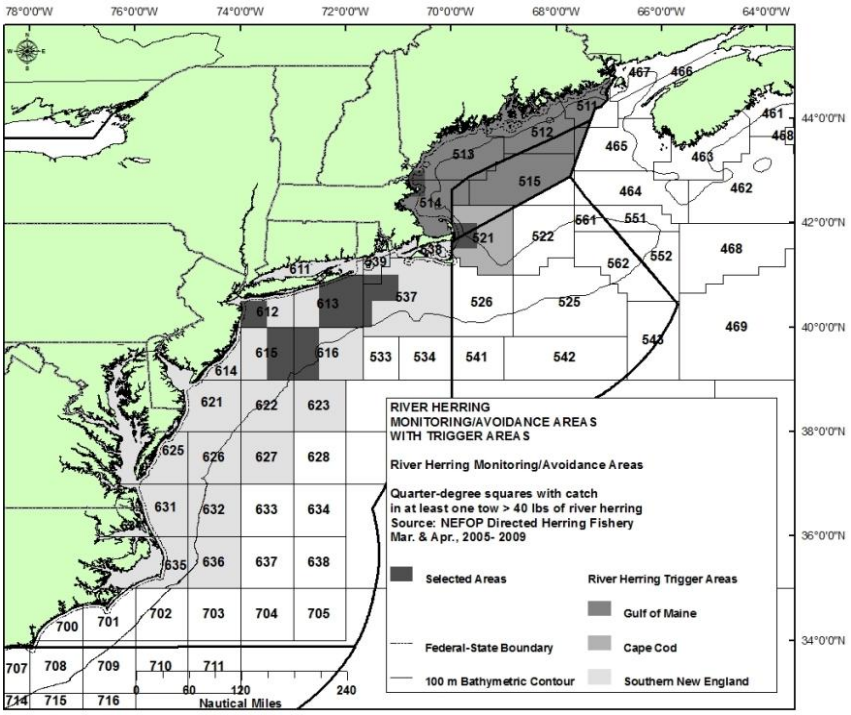


Figure 11 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for May – June

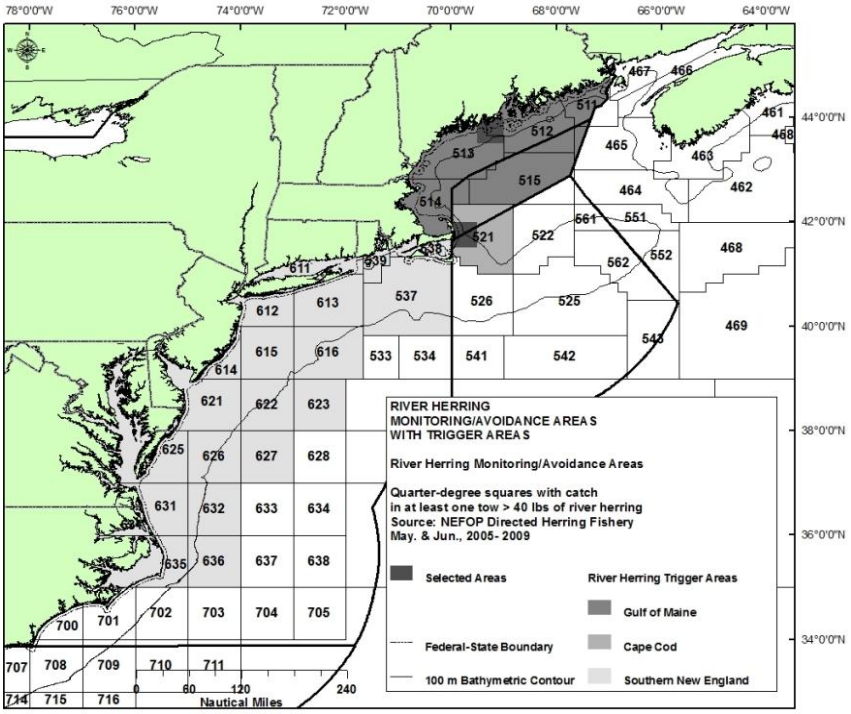


Figure 12 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for July – August

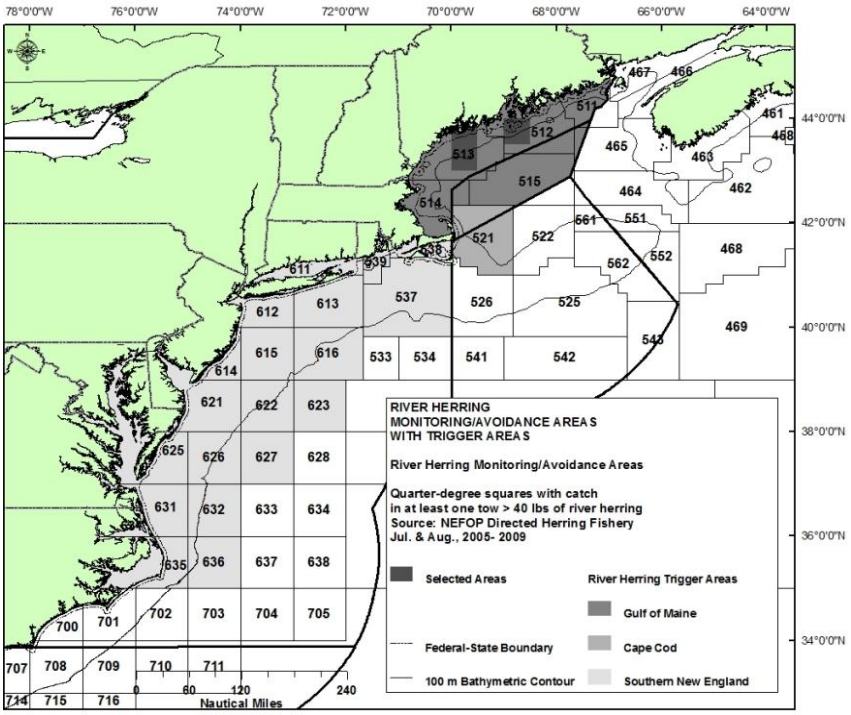


Figure 13 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for September – October

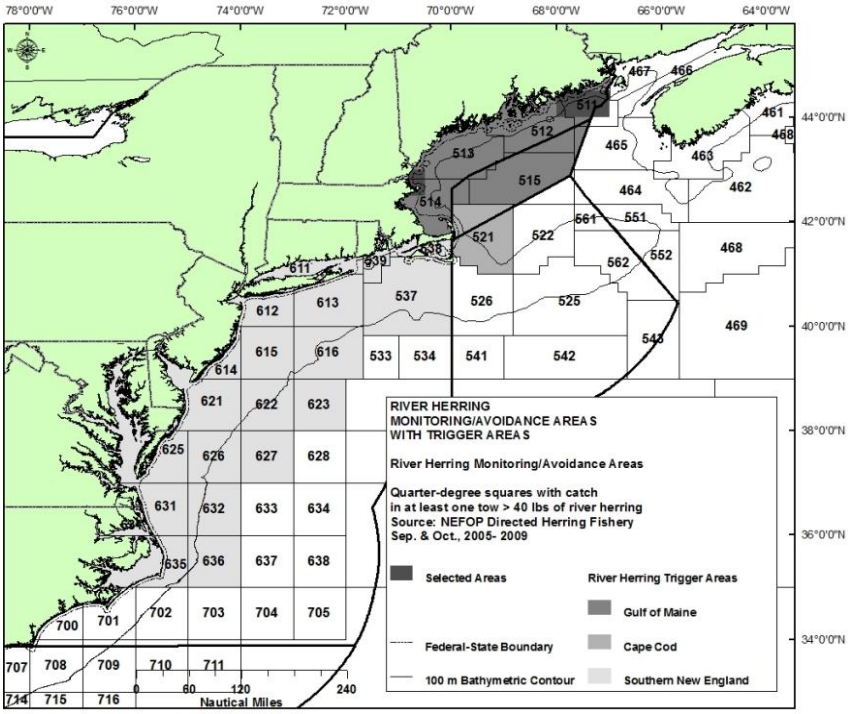
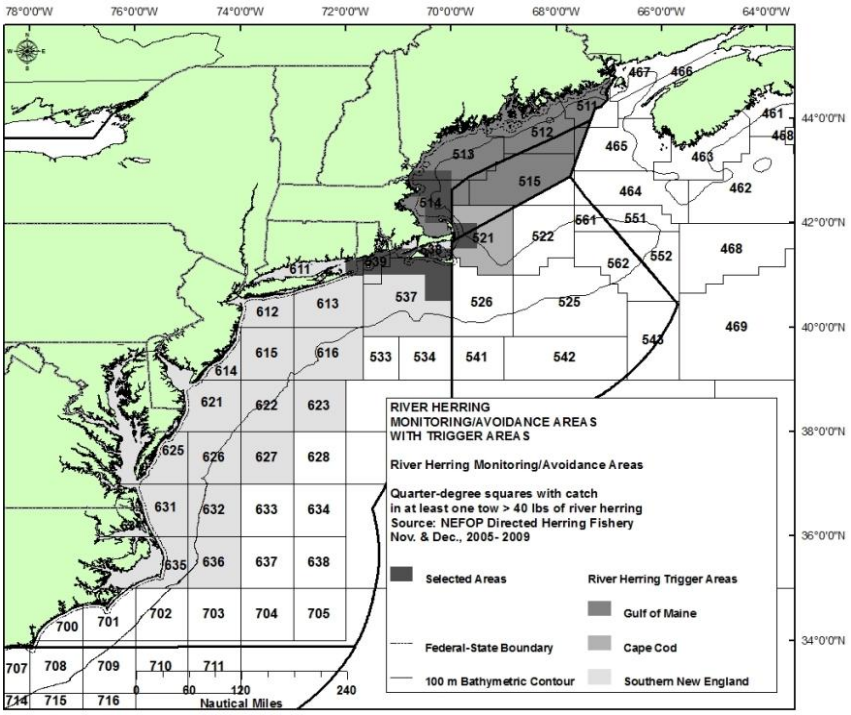


Figure 14 Alternative 2: River Herring Monitoring/Avoidance Areas Associated with Catch Trigger Areas for November – December



3.3.2.2.4 Option 4: Two-Phase Bycatch Avoidance Approach Based on SFC/SMAST/DMF Project *(Preferred Alternative)*

This option represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

This option would implement a mechanism to develop a two-phase river herring bycatch avoidance program developed in cooperation with the fishing industry, represented by the Sustainable Fisheries Coalition (SFC) working in partnership with Massachusetts Division of Marine Fisheries (MA DMF) and UMASS Dartmouth School of Marine Science and Technology (SMAST). The current (ongoing) SFC river herring bycatch avoidance project has been funded by the National Fish and Wildlife Foundation (NFWF, see additional information below).

Under this option, a long-term river herring bycatch avoidance strategy would be developed, reviewed and potentially implemented through regulation for the Atlantic herring fishery through a two-phase approach, beginning in Amendment 5:

1. **Phase I (Amendment 5) –**

   A. Identify Preliminary Bycatch Avoidance Areas (Section 3.3.2.1);

   B. Focus/increase monitoring/sampling in the Monitoring/Avoidance Areas (through Amendment 5 catch monitoring program the requirement for 100% observer coverage on Category A and B vessels proposed in this amendment, see Section 3.2.1.2);

   C. Establish mechanism for adjusting Monitoring/Avoidance Areas and implementing long-term river herring bycatch avoidance strategies in the future through a framework adjustment to the Herring FMP (Section 3.5);

   D. Work with SFC, SMAST, and MA DMF to support the current project, encourage the collection of additional information, and promote the development of long-term bycatch avoidance strategies.

   During the continued development, and upon the implementation of Amendment 5, the Council, through its staff and the Herring PDT, will continue to work with the SFC, SMAST, and MA DMF to evaluate progress related to the SFC river herring bycatch avoidance program. As details emerge and additional information becomes available, the PDT will update the Herring Committee/Council and assess various elements of the project, including data (nature, quality, and timeliness), and fleet compliance and communication. The Herring PDT will work with the SFC/SMAST/DMF during this time to evaluate the appropriateness of the River Herring Monitoring/Avoidance Areas and will develop recommendations for any adjustments to those areas, which would occur during Phase II (see following).

2. **Phase II (Possible Framework Adjustment) –**

   Upon completion of the SFC bycatch avoidance project (anticipated 2013), the Council will review the results and consider developing a framework adjustment to implement any additional bycatch avoidance strategies that it deems to be appropriate. If the SFC/SMAST/DMF project is successful, the Council may develop a framework adjustment during Phase II to implement some or all elements of the project as part of a long-term bycatch reduction strategy in the Atlantic herring fishery. During Phase II, the Council would:

A. Formally evaluate the SFC/SMAST/DMF project and its results (through the Herring PDT, Herring Committee, and Council, with input from project participants and the Herring Advisory Panel) upon the project completion (during 2013);

B. Receive recommendations from the Herring PDT and Herring Committee (with input from the AP) regarding the need for/appropriateness of follow-up action to implement a long-term strategy for river herring bycatch reduction through a framework adjustment (mid-late 2013);

C. Conduct an initial Framework Adjustment meeting during 2013 or 2014 – An initial framework meeting would be required by this amendment during 2013 or 2014 in order to formally evaluate the results of the SFC/SMAST/DMF project and develop follow-up management action as necessary. During this process, and depending on the results of the SFC/SMAST/DMF project, the Council may determine that follow-up action is not necessary or appropriate. To emphasize the importance of this issue and express the Council's intent to follow-through with further consideration of management action, however, the initial framework meeting would be **required** in 2013 or 2014 regardless of whether additional action is deemed necessary/appropriate.

D. Conduct a final Framework Adjustment meeting during 2013/2014 (optional, if the Council determines that a follow-up framework action is necessary/appropriate, based on the outcome of the SFC/SMAST project and the Herring PDT/Committee recommendations)

While it is unclear exactly what will result from the SFC/SMAST/DMF project, it is expected that some strategies for reducing bycatch in the fishery will emerge, possibly through a flexible system of communications to enact real-time "move-along rules." Consequently, elements to be specified in the Phase II framework adjustment (if the Council determines that a framework adjustment is appropriate) could include (but are not limited to):

- Adjustments to the River Herring Monitoring/Avoidance Areas;
- The mechanism and process for tracking fleet activity, reporting bycatch events, compiling data, and notifying the fleet of changes to the area(s);
- The definition/duration of "test tows," if test tows would be utilized to determine the extent of river herring bycatch in a particular area(s);
- The threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of the area(s);
- The distance that vessels would be required to move from the area(s); and
- The time that vessels would be required to remain out of the area(s).

The groundwork has been laid in this amendment, as well as through continued work with the parties involved in the project, for this approach to be utilized as a bycatch management/avoidance measure in the future. The potential impacts of this option are discussed in Section 6.4 of this document. Management measures to address bycatch and bycatch monitoring are already included in the list of measures that can be implemented through a framework adjustment to the Herring FMP (CFR Section 648.206).

Rationale: The Council selected this option for river herring monitoring/avoidance because it believes that bycatch management and mitigation can most effectively be addressed by the fishing industry on a real-time basis, in cooperation with management. Sustainable Fisheries Coalition (SFC) members account for the majority of US landings of Atlantic herring and mackerel. River herring species are also encountered in these directed fisheries. Minimizing unintended bycatch has been a goal of SFC members since fisheries managers alerted the industry in 2006 that the river herring species complex was depressed. To help achieve this goal the SFC has joined with the Massachusetts Division of Marine Fisheries (MA DMF) and the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) to develop river herring and American shad (alosine) bycatch avoidance methods through a pilot project. This collaboration seeks to develop (1) a predictive model of where alosines are likely to occur in space and time, (2) a real-time bycatch avoidance intra-fleet communication system, and (3) additional support for port sampling to inform the initiative.

The goal that the Council adopted for Amendment 5 is *river herring monitoring and avoidance*. The proposed Monitoring/Avoidance Areas (see more discussion of rationale related to these measures in Section 3.3.2 of this document) will provide a focus for continued work by the SFC through the river herring bycatch avoidance project. The Council intends to further minimize river herring bycatch and bycatch mortality in the future through follow-up management action, including consideration of river herring catch caps. At its November 2012 meeting, the Council identified a framework adjustment to establish river herring catch caps as a management priority for 2013, so the development of these measures is expected to begin shortly after the submission of Amendment 5, during the review/implementation phase.

The management alternatives considered by the Council in Amendment 5 to address river herring bycatch were based on the river herring hotspot analysis developed by the Herring PDT (see details in Appendix IV, V, and VI). The intent of the structure of the alternatives was to better link the configuration of the river herring areas to the goals of the management program. Ultimately, depending on the outcome of the SMAST/SFC program, the Council may advance the goal of river herring monitoring and avoidance by linking the approach proposed in Amendment 5 with a river herring catch cap and providing the industry with the incentive to develop their own approaches to minimizing bycatch and staying under the cap.

3.3.2.2.5 Options for Exemptions Under Alternative 2

Before selecting final management measures, the Council reviewed river herring bycatch data (provided in this document) and considered exemptions to the Options 1, 2, and 3 under Alternative 2 (described in this section, 3.3.2.2) for vessels participating in either the small mesh northern shrimp fishery (CFR 680.80 (a)(5)) or vessels fishing with mesh greater than 5.5 inches, or both.

Because Option 4 represents the Council's ***Preferred Alternative*** in Amendment 5, there is no need to consider exemptions.

3.3.3 Alternative 3: River Herring Protection

The management goal associated with this alternative is to protect river herring. This alternative includes seasonal closures that are intended to minimize river herring encounters in the herring fishery based on times/areas where the largest encounters with the fishery were observed between 2005 and 2009.

3.3.3.1 Identification of Protection Areas (Alternative 3)

The areas identified in this alternative will be considered River Herring Protection Areas. In Amendment 5, the Protection Areas will be identified bimonthly as the quarter degree squares with at least one observed tow of river herring catch greater than 1,233 pounds, using 2005-2009 Northeast Fisheries Observer Program data from trips with greater than 2,000 pounds of kept Atlantic herring (Figure 15 – Figure 18). These areas can be modified in the future through a Herring FMP amendment, framework adjustment, or the herring fishery specifications process.

Under this alternative, no River Herring Protection Areas would be established in this amendment during May – August.

Figure 15 Alternative 3: River Herring Protection Areas January – February

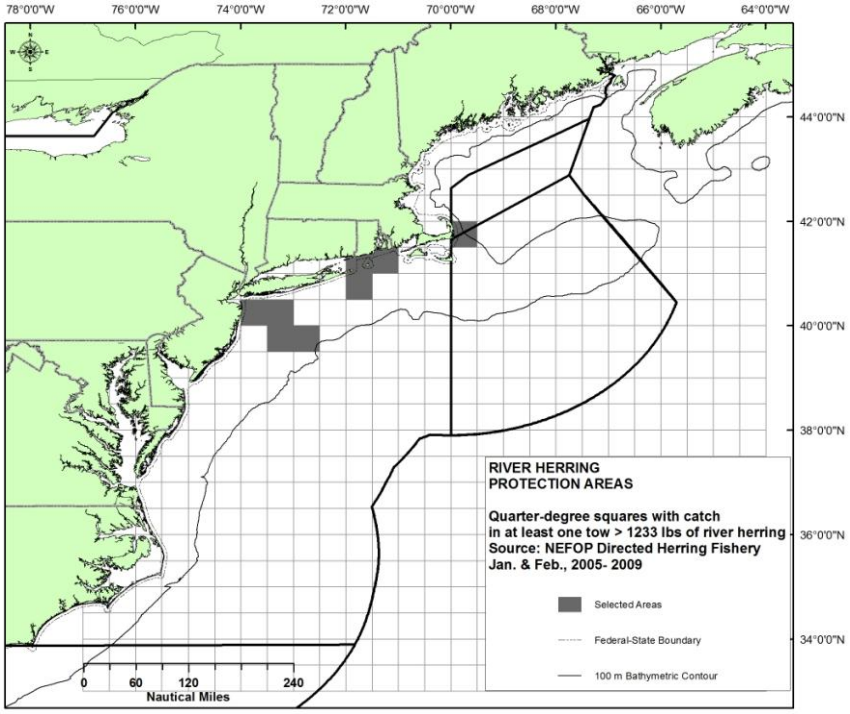


Figure 16 Alternative 3: River Herring Protection Areas March – April

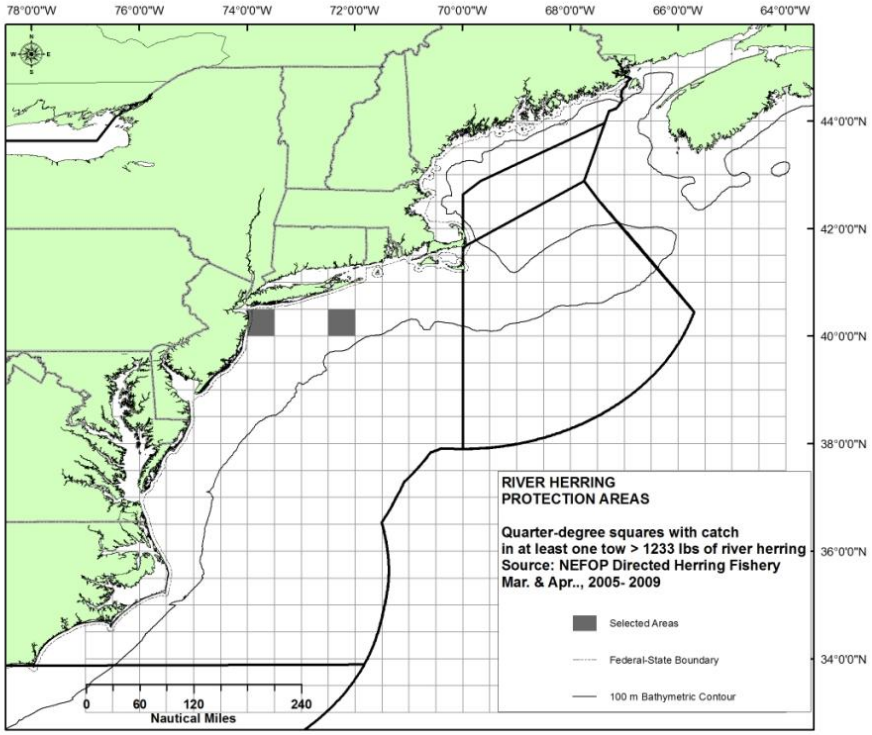


Figure 17 Alternative 3: River Herring Protection Areas September – October

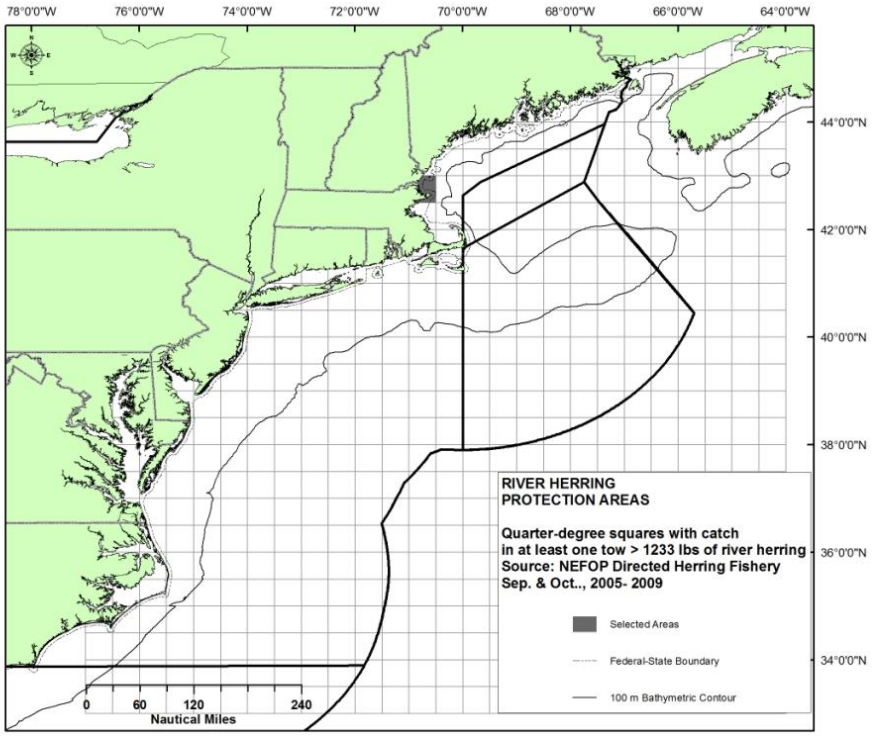
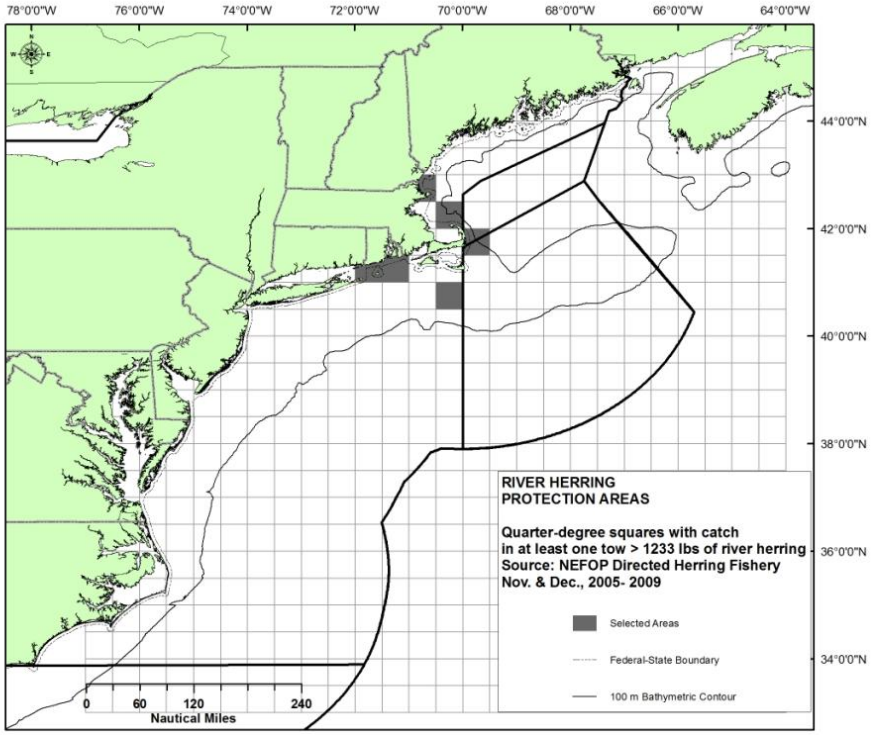


Figure 18 Alternative 3: River Herring Protection Areas November – December



3.3.3.2 Alternative 3: Management Options Under Consideration

3.3.3.2.1 Option 1: Closed Areas

This option would prohibit directed fishing for herring in the areas/times that are identified as River Herring Protection Areas. Under this option, all herring permit holders (Category A, B, C, and D) would be prohibited from fishing for, possessing, catching, transferring, or landing herring from the River Herring Protection Areas on all fishing trips. Vessels that possess A, B, C, or D herring permits and are fishing with mesh greater than 5.5 inches (and with no small mesh on board) would be exempt from the closed area provisions.

Sub-Option: **Mechanism for limited access herring vessels to declare out of the fishery for a period of time**

This option would prohibit directed fishing for herring in the areas/times that are identified as River Herring Protection Areas. Under this option, all herring permit holders (Category A, B, C, and D) would be prohibited from fishing for, possessing, catching, transferring, or landing herring from the River Herring Protection Areas on all fishing trips. Vessels that possess A, B, C, or D herring permits and are fishing with mesh greater than 5.5 inches (and with no small mesh on board) would be exempt from the closed area provisions. If a Category A, B, or C vessel declares out of the herring fishery ("DOF") prior to leaving port, that vessel may fish in the RH Protection Areas but may not harvest, possess, or land herring on that trip (this provision would also apply to mackerel vessels that obtain a permit to allow them to catch more than the current open access allowance of 3 mt – see Section 3.1.6 for options under consideration).

3.3.3.2.2 Option 2: Trigger-Based Closed Areas

This option would close the River Herring Protection Areas identified in this alternative when a specified river herring catch trigger is reached. The areas that would be closed are the Protection Areas contained within the geographic range of the trigger areas. The catch triggers apply to three general areas – Statistical Area 521 (Cape Cod, CC), the Gulf of Maine (GOM), and southern New England (SNE) – see Figure 8 below.

Sub-Options: River Herring Catch Triggers

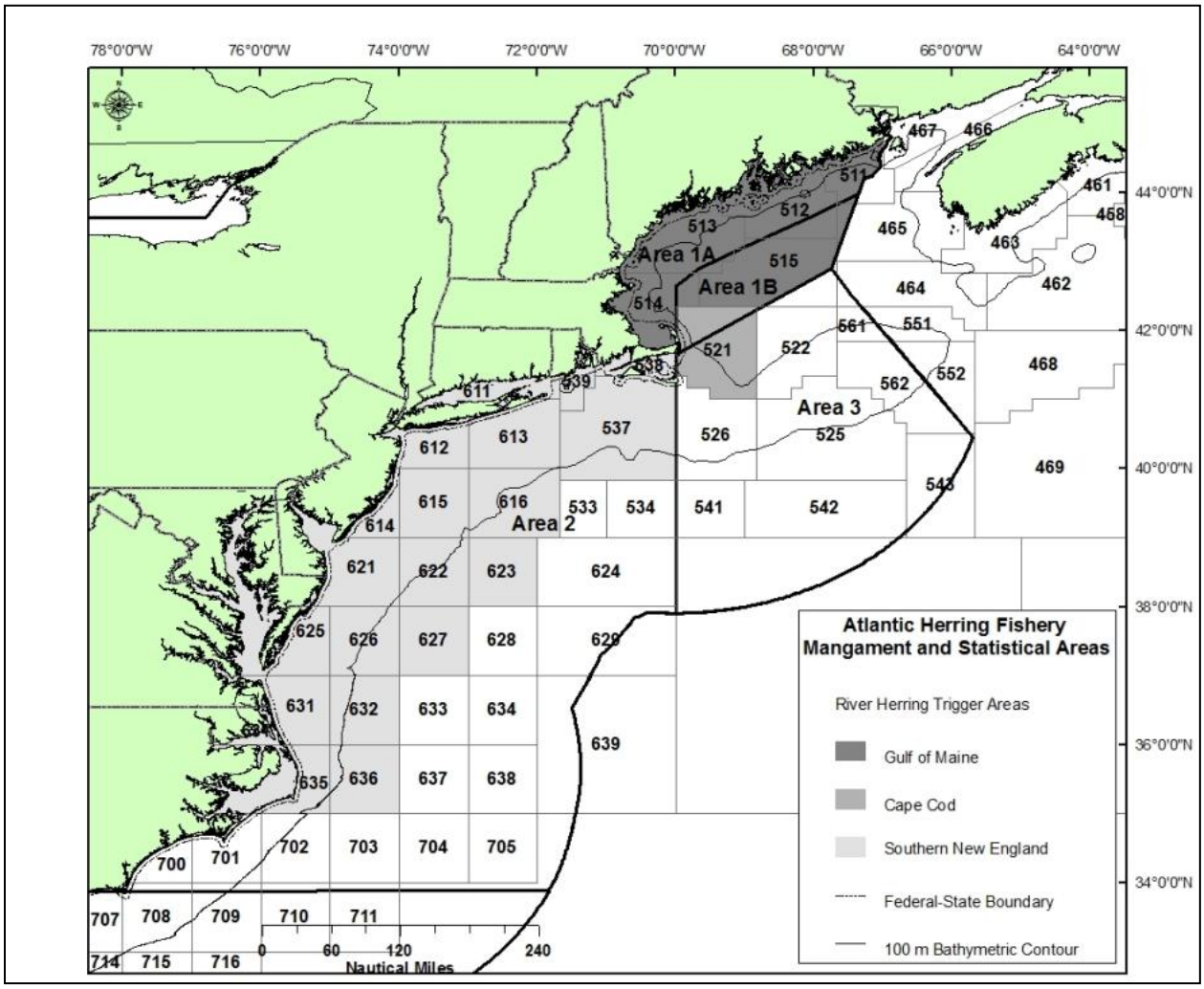
Several sub-options are under consideration for specifying the river herring catch triggers in each of the geographic areas identified in Figure 8. The sub-options are based on the Herring PDT's work to generate the best estimates of river herring removals in recent years (see Table 4 in Herring PDT Discussion Paper: *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery* in Appendix VII (Volume II)) and are summarized below in Table 5. The sub-options include river herring catch estimates based on the maximum, median, and mean annual estimate of river herring catch expanded from observer data from 2005-2009.

Estimates of river herring catch in thousands of pounds (± 2 standard errors) were calculated by the Herring PDT using *Method 2* stratified by gear (midwater trawls, bottom trawls, and purse seines), area (Gulf of Maine (GOM, Statistical Areas 511-514), Cape Cod (CC, Statistical Area 521), and Southern New England (SNE)), and year (2005, 2006, 2007, 2008, and 2009). *Method 2* is the Simple Expansion Method (see SBRM 5.4.2.3. Simple Expansion Method: mean discard per trip, pp 143) modified to include both kept and discarded river herring. These estimates were summed across gear types for each year and area combination. Then the maximum, median, and mean estimates of river herring catch were selected to form the sub-options (Table 5).

Table 5 Sub-Options for River Herring Catch Triggers (Pounds)

Area	SUB-OPTIONS		
	3A (Max)	3B (Median)	3C (Mean)
CC	1,159,700	93,400	269,600
GOM	294,000	92,400	127,100
SNE	729,500	585,000	478,500

Figure 19 River Herring Catch Trigger Areas (Shaded)



Monitoring the River Herring Catch Triggers – Reporting Options

During the fishing year, river herring catch in each of the trigger areas identified above will be monitored and estimated using observer data from all trips by herring vessels subject to this rule unless the vessel has declared out of the fishery (DOF) through VMS. Observed estimates of river herring catch will be expanded to an estimate of total river herring catch in each of the trigger areas. The estimation procedure will be developed by the NERO, in cooperation with the NEFSC and Council staff, and through consultation with the Council. The final calculation process will be provided on the NERO web page. Area-specific river herring catch estimates will be published on the NERO web page regularly.

Reporting Option 1: Report Total Catch by Trigger Area

In addition to reporting herring by herring management area through the ACL-monitoring system, herring vessels subject to this rule must report total catch (kept and discarded) by river herring catch trigger area so that the appropriate expansions can be made from the observed catch in those areas. For the purposes of this requirement, the **river herring catch trigger areas** are defined as the following statistical areas:

- Gulf of Maine (GOM) – Areas 511, 512, 513, 514, 515, 464, 465 (same as modified GOM haddock stock area established in Framework 46)
- Cape Cod (CC) – Area 521
- Southern New England (SNE) – Areas 537, 538, 539, 611, 612, 613, 614, 615, 616, 621, 622, 623, 625, 626, 627, 631, 632, 635, 636

Reporting Option 1 – Example Catch Report

This report is required by all limited access herring vessels on all declared herring trips. For each day of a declared trip, this report must be submitted by 9 AM the following day. Negative reports (0 lb) must be submitted when no fish were caught.

Note: VTR serial number must be the same number reported to the seafood dealer receiving the landings at the end of the trip. If you use multiple pages of the VTR on the trip, record the serial number from the first VTR page used.

Vessel Trip Report (VTR) Serial Number: _____
Date fish caught: Month (01-12) _____
Day (01-31) _____
Gear used to fish: (MWT, PS, BT) _____

SPECIES	AREA 1A	AREA 1B	AREA 2	AREA 3
Herring Kept (lb)	_____	_____	_____	_____
Herring Discarded (lb)	_____	_____	_____	_____

==========

All Fish Kept (lb) GOM RH Area CC RH Area SNE RH Area
_____ _____ _____

All Fish Discarded (lb) GOM RH Area CC RH Area SNE RH Area
_____ _____ _____

Note: Reporting by river herring area is required for all limited access vessels. Include total lb of all herring and non-herring. GOM RH Area includes Stat Areas 464, 465, and 511 thru 515. CC RH Area is Stat Area 521. SNE RH Area includes Stat Areas 537, 538, 539, 611, 612, 613, 614, 615, 616, 621, 622, 623, 625, 626, 627, 631, 632, 635, and 636.

All Fish Kept (lb) GOM Haddock Area GB Haddock Area
_____ _____

Note: Reporting by haddock area is only required for vessels using mid-water trawl gear in Areas 1A, 1B, and/or 3. Include total lbs of all herring and non-herring.

GOM Haddock Area includes Stat Areas 464, 465, and 511 thru 515.
GB Haddock Area includes Stat Areas 521, 522, 525, 526, 561, and 562.

Reporting Option 2: Report Total Catch by Statistical Area

Under this option, in addition to reporting herring by herring management area through the ACL-monitoring system, herring vessels subject to this rule must report total catch (kept and discarded) by statistical area so that the appropriate expansions can be made from the observed catch in those areas to monitor both the haddock catch caps (Framework 46) and any river herring catch trigger areas that may be established.

Reporting Option 2 – Example Catch Report

This report (example for Reporting Option 2) is required by all limited access herring vessels on all declared herring trips. For each day of a declared trip, this report must be submitted by 9 AM the following day. Negative reports (0 lb) must be submitted when no fish were caught.

Note: VTR serial number must be the same number reported to the seafood dealer receiving the landings at the end of the trip. If you use multiple pages of the VTR on the trip, record the serial number from the first VTR page used.

Vessel Trip Report (VTR) Serial Number: _____
Date fish caught: Month (01-12) _____
Day (01-31) _____
Gear used to fish: (MWT, PS, BT) _____

SPECIES	AREA 1A	AREA 1B	AREA 2	AREA 3
Herring kept (lbs)	_____	_____	_____	_____
Herring discarded (lbs)	_____	_____	_____	_____

Report all fish kept (herring and non-herring species) and the Stat Area in which the fish were caught. If fish were caught in multiple Stat Areas in one day, report the fish kept (lbs) in each Stat Area.

All Fish Kept (lbs) _____ Stat/Chart Area ____

All Fish Kept (lbs) _____ Stat/Chart Area ____

All Fish Kept (lbs) _____ Stat/Chart Area ____

Management Measures That Apply When Trigger is Reached

When the river herring catch trigger in a specified area(s) is reached, then the River Herring Protection Areas within that geographic area where the trigger is reached will be closed on a bimonthly basis. The closures will apply to all Protection Areas within the trigger area(s) for the remainder of the fishing year. Figure 20 – Figure 23 below illustrate which Protection Areas are associated with the trigger areas. For example, if the Gulf of Maine river herring catch trigger is reached in March, then the shaded quarter degree square in the inshore Gulf of Maine shown in Figure 22 would close during September and October, and the two square in the same trigger area shown in Figure 23 would close for November and December. Similarly, if the southern New England River Herring Catch Trigger is reached in August, then only the shaded squares shown in the southern New England trigger area would close in November and December (Figure 23 – no closures in the southern New England area would occur during September/October as shown in Figure 22).

Figure 20 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for January – February

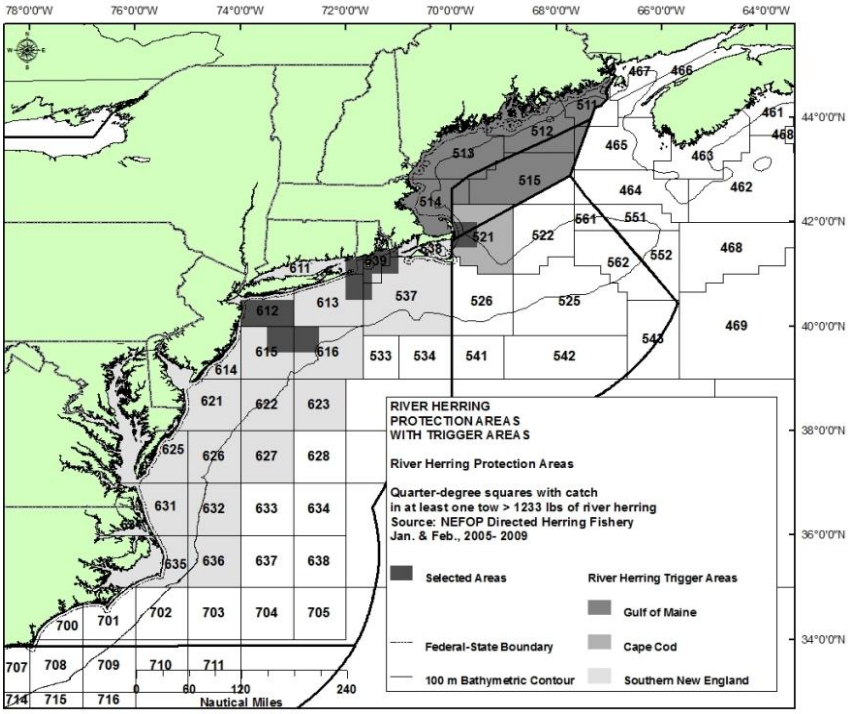


Figure 21 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for March – April

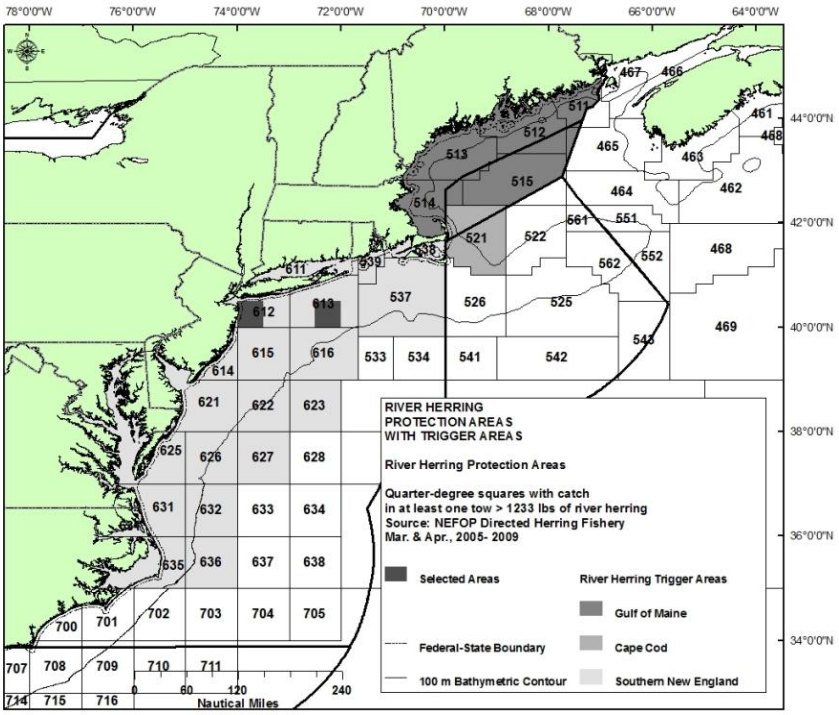


Figure 22 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for September – October

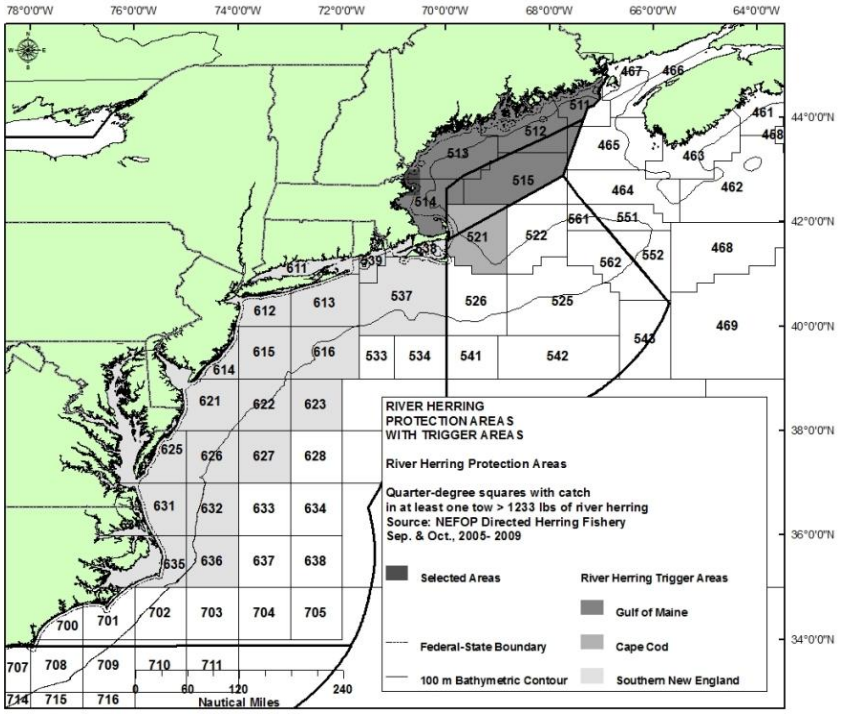
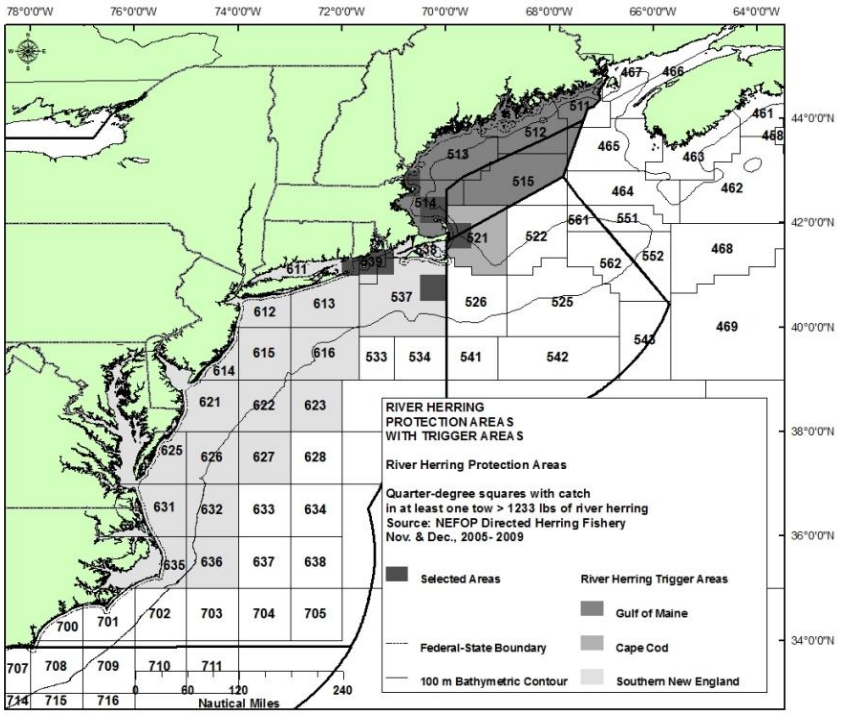


Figure 23 Alternative 3: River Herring Protection Areas Associated with Catch Trigger Areas for November – December



3.3.3.2.3 Options for Exemptions Under Alternative 3

Before selecting final management measures, the Council will review river herring bycatch data (provided in this document) and consider exemptions to the Options under Alternative 3 (described in this section, 3.3.3.2) for vessels participating in either the small mesh northern shrimp fishery (CFR 680.80 (e)) or vessels fishing with mesh greater than 5.5 inches, or both. The Council is seeking public comment on this issue and may determine that either or both of these fisheries should be exempt from the river herring management options when it selects final management measures for Amendment 5.

Because Alternative 3 was not selected as the Council's ***Preferred Alternative*** in Amendment 5, there is no need to consider exemptions.

3.3.4 Mechanism for Adjusting/Updating River Herring Areas (***Preferred Alternative***)

River herring management areas (for monitoring, avoidance, and/or protection) can be modified/updated through an amendment or framework adjustment to the Herring FMP. The areas should be reviewed by the Herring Plan Development Team every three years as part of the Atlantic herring fishery specifications process. Any modifications/adjustments, as deemed necessary by the Council, should accompany the specifications package (i.e., joint specifications/framework adjustment package). The MAFMC and ASMFC would be consulted during the adjustment process.

3.3.5 River Herring Catch Caps *(Preferred Alternative)*

The Council will consider establishing a river herring catch cap for the Atlantic herring fishery as one of several potential measures to reduce bycatch. The catch cap will be considered by the Council through a framework adjustment to the Herring FMP or the Atlantic herring fishery specifications process after the ASMFC completes its stock assessment.

Rationale: Though Amendment 1 authorized the implementation of measures to address bycatch (including catch caps) through the framework adjustment process, the information and analyses presented in Amendment 5 more specifically address concerns related to river herring and include information to form the basis for implementing a catch cap and the necessary reporting and monitoring provisions to ensure its effectiveness. The measure has been more thoroughly evaluated in Amendment 5, allowing more timely and efficient implementation in the future through the framework adjustment process. The Herring PDT provided a detailed discussion paper addressing the development of river herring catch caps, including a discussion of the potential challenges associated with implementing and monitoring, as well as the potential impacts of catch caps. The Herring PDT's discussion paper can be found in Volume II of this amendment (Appendix VII) and forms the basis for future development of river herring catch caps through a framework adjustment, or through the herring specifications process.

While data are not robust enough at this time to determine a biologically-based catch cap and/or the potential effects on the river herring stock of such a catch cap, the Council supports establishing this mechanism and considering approaches for setting a river herring catch cap in the herring fishery in as timely a manner as possible. The framework adjustment process can provide the mechanism to implement this cap.

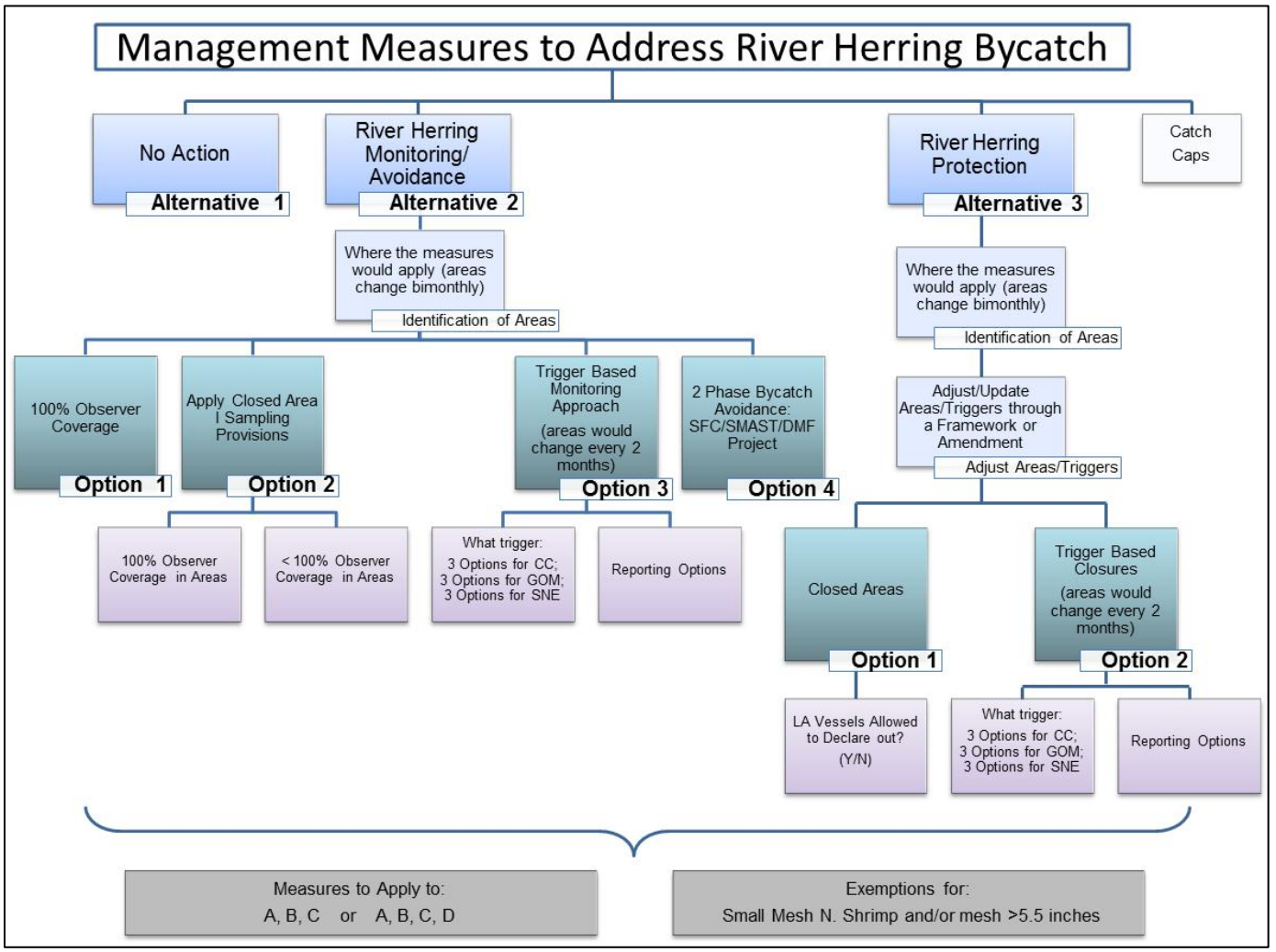
The Council believes that a river herring catch cap would provide a strong incentive for the industry to avoid river herring and help to minimize its overall catch. A river herring catch cap, in combination with the ***Preferred Alternative*** for river herring bycatch monitoring/avoidance (Alternative 2, Option 4, see previous discussion in Section 3.3.2.2.4), would form the basis for a long-term approach to managing river herring bycatch similar to that used for managing yellowtail flounder bycatch in the scallop fishery. The Council supports this approach as the most effective, least costly manner to allow the industry to manage its own bycatch.

The Council is aware of the pending ESA determinations for river herring and the potential effects that the determination could have on the herring industry, which is why the Council is also proposing Alternative 2, Option 4 (Two Phase bycatch avoidance approach based on SFC/SMAST/DMF project) to address river herring bycatch in this amendment. As a data improves, so will the ability to perform analyses to inform management decisions and support effective, long-term management that minimizes bycatch to the extent practicable.

3.3.6 Summary of Measures Under Consideration to Address River Herring Bycatch

Figure 24 provides an illustrative summary of the range of management alternatives/options that were considered in Amendment 5 to address river herring bycatch, as they were presented in the Amendment 5 DEIS. The Council's ***Preferred Alternative*** is Alternative 2, Option 4, applied to all limited access herring vessels (Category A/B/C). No exemptions are proposed.

Figure 24 Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch

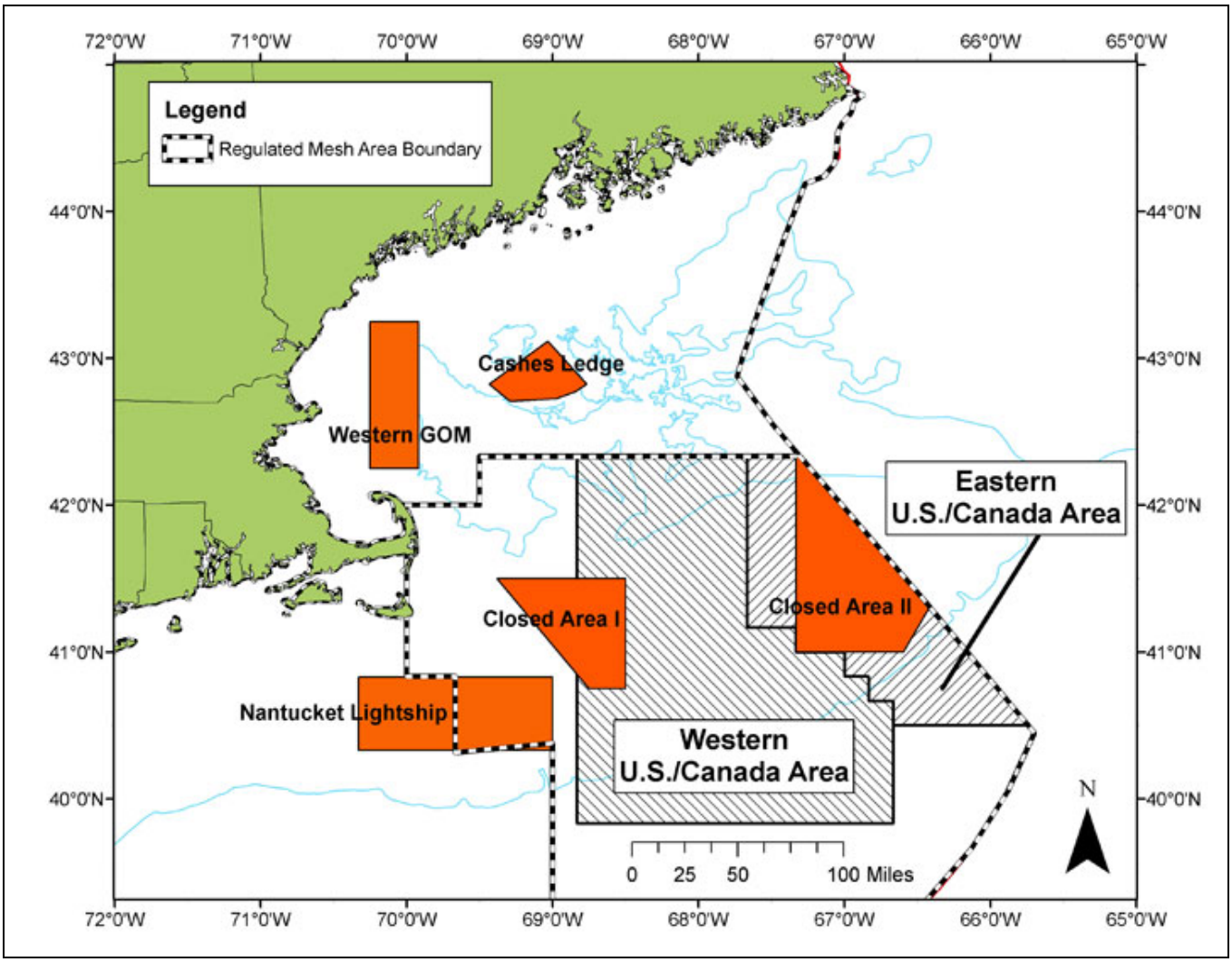


*The Council's **Preferred Alternative** is Alternative 2, Option 4, applied to all limited access herring vessels (Category A/B/C). No exemptions are proposed.*

3.4 MANAGEMENT MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

The alternatives that the Council considered in Amendment 5 to establish criteria for midwater trawl (single and paired) access to year-round groundfish closed areas are described in the following subsections. The Council's ***Preferred Alternative*** is Alternative 4A. If the groundfish year-round closed areas are modified and/or eliminated in the future, access by midwater trawl vessels will be considered accordingly in the related groundfish action.

Figure 25 Year-Round Multispecies Closed Areas (Solid Shading)



3.4.1 Alternatives 1 and 2

Alternative 1 – No Action

Under the no action alternative, current criteria for midwater trawl vessel access to the groundfish closed areas would be maintained. This includes access to the groundfish closed areas, with additional provisions for observer coverage and increased sampling in Closed Area I (based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80)) as well as provisions implemented through Framework 46 to the Northeast Multispecies (Groundfish) FMP.

Under the no action alternative, vessels issued a Federal herring permit and fishing with midwater trawl gear in Closed Area I must declare to NMFS their intent to fish in the closed area at least 72 hours prior to beginning a trip and carry onboard a NMFS-approved observer. Vessels fishing in Closed Area I with midwater trawl gear cannot release fish from the codend of the net, transfer fish to another vessel that is not carrying a NMFS-approved observer (e.g., an Atlantic herring at-sea processing vessel or an Atlantic herring carrier vessel), or discard fish at sea. In addition, all of the fish caught using midwater trawl gear in Closed Area I must be brought aboard the vessel and made available for sampling and inspection by the observer, except in the case of mechanical failure or spiny dogfish clog the net. However, if fish are released from the codend for any of these reasons, without being sampled by a NMFS-approved observer, the vessel must leave the Closed Area I and submit a Closed Area I Midwater Trawl Released Codend Affidavit to NMFS.

Vessels issued a Category A/B herring permit and on a declared herring trip, regardless of gear or area fished, and or a vessel issued a Category C permit and/or an Category D permit (open access) that fishes with midwater trawl gear in Areas 1A, 1B, and 3 are prohibited from discarding haddock at sea. Herring processors and dealers are required to separate out, and retain such haddock for at least 12 hours for inspection by authorized NMFS officers. These vessels can also possess and land up to 100 lb. of other NE multispecies. However, haddock or other NE multispecies separated from the herring catch may not be sold, purchased, received, traded, bartered, or transferred, or attempted to be sold, purchased, received, traded, bartered, or transferred for, or intended for, human consumption.

Alternative 2 – Pre-Closed Area I Provisions

Under this alternative, criteria for midwater trawl vessel access to the groundfish closed areas would be based on provisions prior to the implementation of the Closed Area I rule. Herring midwater trawl vessels would be allowed to access all of the year-round groundfish closed areas without further limitations (the haddock catch cap and 100-pound multispecies possession limit would still apply, consistent with the Framework 46 provisions implemented in September 2011).

Vessels issued a Federal herring permit would no longer be required to give 72 hours' notice before beginning a trip to the NMFS observer program, and would no longer be required to carry a NMFS-approved observer in order to fish in Closed Area I. In addition, there would no longer be any requirements for fish caught using midwater trawl gear to be brought on board the vessel and be sampled by an observer.

Vessels issued a Category A or B herring permit and on a declared herring trip, regardless of gear or area fished, and or a vessel issued a Limited Access Incidental Catch Herring Permit and/or an Open Access Herring Permit that fished with midwater trawl gear in Areas 1A, 1B, or 3 are still prohibited from discarding haddock at sea. Herring processors and dealers are required to separate out, and retain such haddock for at least 12 hours for inspection by authorized NMFS officers. These vessels can also still

possess and land up to 100 lb of other NE multispecies. However, haddock or other NE multispecies separated from the herring catch may not be sold, purchased, received, traded, bartered, or transferred, or attempted to be sold, purchased, received, traded, bartered, or transferred for, or intended for, human consumption.

Because this alternative implements less restrictive management measures than current provisions, implementing this measure would require action under the Multispecies FMP, so Amendment 5 would need to serve as a joint groundfish action (Framework Adjustment to the Multispecies FMP).

3.4.2 Alternative 3: 100% Observer Coverage

This option would require herring midwater trawl (single and paired) vessels to carry a NMFS-approved observer on board on any trip in the groundfish year-round closed areas.

Midwater trawl vessels subject to this measure would be required to carry a NMFS-approved observer on any trip where fishing may occur in the year-round multispecies closed areas. Vessels would be required to indicate their intention to fish in the multispecies closed areas when scheduling an observer through the pre-trip notification system. To ensure 100% coverage, vessels would be prohibited from fishing in the closed areas without a NMFS-approved observer on board.

The Closed Area I sampling provisions (based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80)) and haddock catch cap/Framework 46 provisions would continue to apply under this alternative.

3.4.3 Alternative 4: Closed Area I Provisions *(Preferred Alternative)*

This option (Alternative 4A, described below) represents the Council's *Preferred Alternative* for Amendment 5, as voted at the June 19-21, 2012 NEFMC Meeting.

This alternative would apply the current provisions for midwater trawl vessels in Closed Area I to all of the groundfish year-round closed areas, based on the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80). Under this alternative, the following provisions would apply to midwater trawl (single and paired) vessels (regardless of herring permit category) fishing in the groundfish year-round closed areas on any trips with a NMFS-approved observer on board (options for levels of observer coverage in the year-round groundfish closed areas are described below):

- When fishing in a groundfish year-round closed areas with a NMFS-approved observer on board, all midwater trawl vessels would be required to pump aboard all fish from the net for inspection and sampling by the observer. Vessels that do not pump fish would be required to bring all fish aboard the vessel for inspection and sampling by the observer. Unless specific conditions are met (see below), vessels would be prohibited from releasing fish from the net, transferring fish to another vessel that is not carrying a NMFS-approved observer, or otherwise discarding fish at sea, unless the fish have first been brought aboard the vessel and made available for sampling and inspection by the observer.
- Vessels may make short test tows in the area to check the abundance of target and bycatch species without pumping the fish on board if the net is reset without releasing the contents of the test tow. In this circumstance, catch from the test tow would remain in the net and would be available to the observer to sample when the subsequent tow is pumped out.

- Fish that have not been pumped aboard may be released if the vessel operator finds that:
    1. pumping the catch could compromise the safety of the vessel;
    2. mechanical failure precludes bringing some or all of the catch aboard the vessel; or
    3. spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.
- If the net is released for any of the reasons stated above, the vessel operator would be required to complete and sign a Released Catch Affidavit providing information about where, when, and why the net was released, as well as a good-faith estimate of the total weight of fish caught on the tow and weight of fish released. The Released Catch Affidavit must be submitted within 48 hours of completion of the fishing trip.
- Following the release of the net for one of the three exemptions specified above, the vessel would be required to exit the groundfish year-round closed area. The vessel may continue to fish but may not fish in the groundfish year-round closed area for the remainder of the trip.

If the groundfish year-round closed areas are modified and/or eliminated in the future, access by midwater trawl vessels will be considered accordingly in the related groundfish action.

Option 4A Require 100% Observer Coverage (Preferred Alternative): Under this alternative/option, midwater trawl (single and paired) vessels would be required to carry a NMFS-approved observer on **all trips** where fishing may occur in the groundfish year-round closed areas. Vessels would be required to indicate their intention to fish in the groundfish year-round closed areas when scheduling a NMFS-approved observer through the pre-trip notification system. To ensure 100% coverage, midwater trawl vessels would be prohibited from fishing in the groundfish year-round closed areas without a NMFS-approved observer on board. The sampling provisions described above would apply on all trips in the year-round closed areas since 100% observer coverage in these areas would be required.

Note: This amendment proposes 100% observer coverage on Category A and B herring vessels (see Section 3.2.1.2). The measures proposed in this section would extend the observer coverage requirements and would require Closed Area I sampling provisions on all midwater trawl vessels fishing in the year-round closed areas.

Option 4B Less Than 100% Observer Coverage: Under this alternative/option, observer coverage would be distributed on limited access herring vessels based on the provisions in Amendment 5 (see alternatives in Section 3.2.1, Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels). If the alternative for 100% observer coverage is adopted (Section 3.2.1.2), then this sub-option would only apply to midwater trawl vessels with open access permits. Midwater trawl vessels would be required to indicate their intention to fish in the groundfish year-round closed areas when scheduling a NMFS-approved observer through the pre-trip notification system but would not be prohibited from fishing in the groundfish year-round closed areas if an observer is not deployed (with the exception of Closed Area I). The sampling provisions described above would apply on all trips in the year-round closed areas with a NMFS-approved observer on board.

Rationale: The Council supports the ***Preferred Alternative*** to address concerns about midwater trawl bycatch of groundfish in the closed areas, especially given the recently emerging data that shows some groundfish stocks (cod, for example) are in significantly worse condition than previously known. The Council intends to minimize the risk that juvenile or spawning groundfish can be caught in the areas designed to protect them and control fishing mortality.

The sampling provisions implemented in Closed Area I (CA I) appear to have been successful in reducing slippage events to date, so the Council proposes to apply them to other year-round groundfish closed areas to improve sampling of catch on herring vessels and minimize slippage/discarding of unsampled catch. The Council is proposing similar requirements across the fishery as part of the measures to address net slippage in this amendment, and the rationale for the ***Preferred Alternative*** in the groundfish closed areas is similar to that provided for the measures to address slippage (see Section 3.2.3 for more discussion). The most significant difference is that the measures for access to the groundfish closed areas apply to midwater trawl vessels only and do not include trip termination provisions. It is intended, however, that slippage events in the closed areas still apply to the proposed trip termination thresholds if the slippage event occurs for reasons (1) or (2) specified in the proposed provisions.

The effectiveness of the Closed Area I provisions was evaluated during the development of the measures in Amendment 5. According to the Amendment 5 DEIS, there were 99 hauls observed in Closed Area I during 2010, under the new provisions for sampling catch, implemented in November 2009. There were no slippage events observed in these 99 hauls, and consequently no Released Catch Affidavits were submitted from the Closed Area I fishery in 2010. There appears to have been one released catch event (estimated 1,500 pounds) on a haul that ended (but did not begin) in Closed Area I. In 2011, there were 28 hauls observed in the Closed Area I from vessels on declared Atlantic herring trips. These hauls represent less than three (3) vessels fishing, and therefore, the specific details cannot be released due to confidentiality restrictions. There were no partial or full slippage events documented in Closed Area I during 2011. There were 313 observed trips in all Atlantic Herring Management areas (trips defined by gear type and include purse seine and paired/single midwater trawl) in 2011, resulting in a total of 723 associated observed hauls.

Though groundfish bycatch is not considered to be a significant problem, the Council believes that efforts to further minimize the occurrence of groundfish bycatch are necessary at this time due to the recent (overfished) status of some important groundfish stocks (see response to the comment above). The Council is aware of the possible predation of the pelagic species that is driving the cod and haddock stocks to a severely depressed level, but more data and analysis are needed. It was suggested that Alternative 4 would provide a greater source of information regarding the nature and extent of bycatch (versus Alternative 2). This measure also addresses perceived inequities expressed by many stakeholders during the DEIS comment period regarding the allowance of gear that is capable of catching groundfish into the groundfish closed areas. The proposed provisions for access to the year-round groundfish closed areas still allow the herring midwater trawl fishery to operate in the groundfish closed areas but ensure that monitoring and sampling are maximized based on measures that already have proven to be effective in Closed Area I.

3.4.4 Groundfish Alternative 5: Closed Areas

This alternative closes the year-round groundfish closed areas to midwater trawl vessels participating in the herring fishery. Under this alternative, access to groundfish closed areas by midwater trawl vessels (single and paired) that are not declared out of the fishery (DOF) would be prohibited except with an experimental fishing permit (EFP).

The Council would strongly endorse experimental fisheries in the groundfish closed areas that include some or all the following provisions:

- Full observer coverage (one or more NMFS-approved observers per vessel, as necessary to ensure that every haul is observed)
- Electronic monitoring systems to augment observer data
  - Tow characteristics (i.e., total catch, GPS, height of foot-rope)
  - Video record of catch pre-sorted on deck for observer analysis
- Possible additional elements of EFP for groundfish closed area access
  - Pair trawling in closed areas prohibited
  - No more than 20 midwater trawl trips per closed area per fishing year
  - Fishing with net foot-rope less than 20 feet off the bottom prohibited
  - Monitoring protocols including mandatory reporting of vessel electronics information and shoreside gear inspections to determine the depth fished by midwater trawl gear and whether contact with the bottom has occurred
  - Groundfish bycatch triggers exclude vessels from access to the closed areas
    - Groundfish bycatch is detected in an amount greater than 100 pounds for any vessel trip – all midwater trawling in such closed area suspended for a minimum of 48 hours
    - Overfished stock – Regional Administrator determines bycatch to be 0.1% of TAC for stock – one year exclusion
    - Other groundfish – Regional Administrator determines bycatch to be 0.5% of TAC for stock – one year exclusion

3.5 ADDITIONAL MEASURES THAT CAN BE IMPLEMENTED THROUGH A FRAMEWORK ADJUSTMENT TO THE HERRING FMP

For any new management measures adopted in Amendment 5, changes to those measures and related adjustments are proposed to be added to the list of measures that can be implemented through a framework adjustment to the Herring FMP in the future. For example, the Council selected Alternative 2 to address river herring bycatch (Monitoring/Avoidance Areas and Option 4 for avoiding bycatch in those areas), so adjustments to the Monitoring/Avoidance Areas and the management measures that pertain to those areas would be added to the list of measures that can be implemented through a framework adjustment in the future. In addition, the Council is proposing that some measures adopted in this amendment and/or part of the herring fishery management program be reviewed/adjusted during the fishery specifications process.

Currently, this document proposes to add river herring catch caps as one measure that could be implemented in the future through a framework adjustment to the Herring FMP. The Herring PDT provided a detailed discussion paper addressing the development of river herring catch caps, including a discussion of the potential challenges associated with implementing and monitoring, as well as the potential impacts of catch caps. The Herring PDT's discussion paper can be found in Volume II of this amendment (Appendix VII) and forms the basis for future development of river herring catch caps through a framework adjustment, or through the herring specifications process, as indicated in Section 3.3.5. The list of additional measures that can be adjusted through either the framework adjustment or fishery specifications process is provided in Table 6 below.

Table 6 Proposed Action: Additional Measures that can be Implemented through a Framework Adjustment and/or Herring Fishery Specifications Process

Add to List of Measures that can be Implemented through a Framework Adjustment
• Adjustments to possession limit for limited access mackerel vessels fishing in Areas 2/3 • Changes to trip notification requirements and declarations • Changes to dealer reporting requirements • Adjustments to measures to address net slippage (including sampling provisions, exceptions for trip termination threshold, trip termination threshold amounts/divisions by area and/or gear type) • Adjustments to requirements for observer coverage levels • Provisions related to industry-funded catch monitoring program (including cost sharing provisions, service provider requirements, waivers) • River herring monitoring/avoidance/protection areas • Provisions for industry-based bycatch avoidance program, including adjustments to the River Herring Monitoring/Avoidance Areas; the mechanism and process for tracking fleet activity, reporting bycatch events, compiling data, and notifying the fleet of changes to the area(s);the definition/duration of "test tows," if test tows would be utilized to determine the extent of river herring bycatch in a particular area(s); the threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of the area(s);the distance that vessels would be required to move from the area(s); and the time that vessels would be required to remain out of the area(s). • Changes to criteria/provisions for accessing year-round groundfish closed areas • Catch caps/bycatch caps
Add to List of Measures that can be Implemented through Fishery Specifications
• Adjustments to possession limit for limited access mackerel vessels fishing in Areas 2/3 • River herring monitoring/avoidance/protection areas • Catch caps/bycatch caps • Provisions related to an industry-funded catch monitoring program (including cost sharing provisions, service provider requirements, waivers)

4.0 MANAGEMENT MEASURES CONSIDERED BUT REJECTED

The management alternatives under consideration in Amendment 5 have been developed by the Council, Herring Committee, Herring Advisory Panel, and Herring PDT from June 2008 (after scoping) until June 2011, when the Council selected the final management alternatives for inclusion in the Final EIS and submission to NMFS. Many different approaches were considered during this process, and the Council reviewed ideas and proposals developed by the AP, herring industry participants, and other interested members of the public. Development of the management alternatives proposed in this amendment was an iterative public process, during which several measures were eliminated from further consideration at this time. Those that were eliminated from further consideration are discussed below, along with the Council's rationale for eliminating them at this time.

It is important to note that although the measures described in this section have been eliminated from further consideration in Amendment 5, the Council may reconsider any of them in a future action for Atlantic herring. In some cases, details and preliminary analyses have already been conducted, making reconsideration of these measures in the future a less burdensome prospect.

4.1 MEASURES TO ADDRESS QUOTA MONITORING AND REPORTING

During development of Amendment 5 the Council two measures to address VMS reporting were removed; the first being a measure that would have required VMS reporting for every offload and transfer that occurred for limited access herring vessels possessing Category A, B, and C permits. The measure was considered to be unnecessarily burdensome and/or complicated, and at this time, options remain under consideration in the document for either daily reporting or trip-level reporting. The second measure considered would have required VMS on all carrier vessels greater than a certain size in length, for declaration purposes when they may be engaged in herring carrying activities. Information presented by the PDT, however, as well as the other options under consideration, suggests that this measure may not be necessary. A "dual option" was created to address this issue; the dual option would allow carriers to operate under status quo requirements (LOA) or use VMS to declare their activities and exempt themselves from the restrictions in the LOA.

The Council also considered and rejected two measures that would have addressed vessel-to-vessel transfers of Atlantic herring. In combination with measures still being considered in this amendment, the first measure that was rejected would have addressed transfer at sea provisions for Category D (Open Access) vessels by allowing vessels with open access Category D permits to transfer herring at sea, with provisions. The measure was rejected because the intent was not clear, nor was it clear how possession limits could be enforced. It was also considered to be status quo for the vessels under consideration. The other measure would have restricted transfers at sea (as defined in this amendment) to only be allowed on trips with a NMFS-approved observer on board. This measure was initially proposed by the NERO staff and was not supported by the Herring Committee.

There was also an option considered that would have created two open access permits for herring, one for all management areas, and another for Areas 2/3 only. The first permit would have adapted the current provisions for a Category D permit; the second would have been a new open access incidental catch permit that would have restricted fishing to Areas 2/3 only and allowed a 25 mt possession limit for herring for one landing per calendar day. This measure was rejected for consistency with corresponding mackerel measures with the MAFMC and to avoid complications with the many vessels that may be involved.

The Council also considered two alternatives to modify the current ACL/sub-ACL monitoring program for the Atlantic herring fishery, which were subsequently removed. The intent of the alternatives was to improve reporting compliance and the accuracy and timeliness of ACL/sub-ACL monitoring information.

Under the first alternative, ACLs and sub-ACLs would continue to be monitored through the Interactive Voice Response (IVR) reporting system, but the system would have been modified. In the first option under the first alternative, all limited access permit holders (Category A, B, and C) would have been required to submit an Atlantic herring catch report via the IVR system on a trip-by-trip basis, and there were four sub-options total. Two sub-options offered differing deadlines for reporting; within 24 hours or 6 hours of each offload or prior to starting the next fishing trip, whichever was less. The other two sub-options would have required that either open access permit holders (Category D) or open access permit holders that possess a Letter of Authorization (LOA) to transfer Atlantic herring at sea would be required to submit an Atlantic herring catch report via the IVR system on a trip-by-trip basis for any trips on which herring was caught (landed or discarded). The second option under the first alternative would have changed the IVR weekly reporting deadlines from Tuesday at midnight (current) to Sunday at midnight in order to provide better lead time for projections and management area closures.

The second alternative would have eliminated IVR call-in program and instead required VMS for catch reporting and quota monitoring for the purposes of monitoring the ACLs/sub-ACLs in the herring fishery. Two reporting requirements for the newly required VMS reporting were available in options under the alternative. The first option would have required daily VMS reporting, and the second option would have required a trip by trip reporting of Atlantic herring catch and discards. Both options would have applied to limited access herring vessels (Category A, B, and C) and would have required reporting the same information but on a different timescale.

The two alternatives to modify the current ACL/sub-ACL monitoring program for the Atlantic herring fishery were removed from consideration on September 8, 2011 when NMFS published the Final Rule in which new notification and reporting requirements for the Atlantic herring fishery were established. The new rules eliminated the need for the Council to further consider VMS catch reporting and/or modifications to the IVR reporting system in this amendment. The NMFS rule includes the following reporting provisions:

- Elimination of the weekly IVR reporting for limited access herring vessels (Category A/B/C) and implementation of the daily VMS catch reporting for all of these boats;
- Incorporation of all open access (Category D) vessels into a weekly IVR catch reporting program (not just those catching 2,000 pounds or more herring in a week); and
- Requirement for weekly VTRs from all herring vessels (instead of monthly).

4.2 MEASURES TO ADDRESS MAXIMIZED RETENTION

The Committee/Council considered several different approaches to developing a maximized retention program for the herring fishery during the development of Amendment 5. After encountering many challenges with the options considered underneath it, however, the main alternative was eliminated from consideration. The alternative would have applied maximized retention for the limited access herring fishery (Categories A, B, and C).

Many of the challenges with the options included addressing the species to which the maximized retention program would apply, how non-permitted/unmarketable landings would be handled, how compliance with MR provisions would be verified, and whether or not the MR program would be phased-in to the fishery. More specifically, the options which were considered but rejected include:

- Two options that addressed the species to which maximized retention applies, one of which would have maximized the retention of all species, and another which considered species-based maximized retention. Under the first option, the vast majority of catch of all species on vessels would have been subject to MR provisions would be landed with two exceptions, and discarding at-sea would have been prohibited. Under the second option the Council would have selected the species to which MR provisions would apply from a list.
- Three options that addressed the likely requirement of landing certain species for which herring vessels have landing limits or are not currently permitted to land at all, along with fish that may not have been be marketable. Non-permitted landings would have included species for which a vessel is not permitted or authorized to land, landings for species that exceed trip limits or quotas and/or landings for species that are bigger/smaller than current size restrictions. All three options were determined to be too difficult to implement due to challenging species such as river herring, which are not allowed to be landed in some states. The options included:
    - An option which would have amended other FMPs and regulations to allow landings, in which a number of other Fishery Management Plans would be amended to modify limits or prohibitions which might affect herring vessels attempting to participate in a maximized retention program. For instance, the Multispecies FMP would have needed to be amended to change landings limits for all other groundfish species except haddock, which has a separate, fishery-wide cap. The complications associated with the measure, such as jurisdictional overlap which may occur for species managed by the Mid-Atlantic Fishery Management Council and Atlantic States Marine Fisheries Commission (ASMFC), and MAFMC and ASMFC, made this option too difficult to be considered feasible.
    - An option that would have required non-permitted/unmarketable catch to be treated in the same manner as haddock that is landed under the catch cap for the herring fishery, established in Framework 43 to the Multispecies FMP. The provisions for landing haddock under the cap include a prohibition for herring vessels from discarding haddock that has been brought on deck or pumped into the fish hold, a prohibition on herring vessels from selling haddock for human consumption, a prohibition for herring dealers from purchasing haddock from herring vessels for human consumption, and a requirement for herring processors to cull and report all haddock and to retain such haddock for 12 hours for inspection by enforcement officials. The option did not address regulatory issues associated with landing species above trip limits, quotas, and/or species for which the vessel is not permitted, and was therefore rejected from consideration.

- An option that would have required that vessels landing non-permitted catch under a maximized retention program be responsible for disposing of that catch once it is landed and documented (through reporting, portside sampling, etc.). Herring dealers and processors would have been required to separate, report, retain, and make available for inspection for 12 hours, all prohibited/non-marketable species in order to facilitate monitoring and enforcement of the maximized retention provisions, and it would have required that law enforcement officials be given access to inspect the culled/sorted catch. The option did not address regulatory issues associated with landing species above trip limits, quotas, and/or species for which the vessel is not permitted and was therefore rejected from consideration.

- Three options that would have verified compliance with the maximized retention provisions, including the option to require video-based electronic monitoring (VBEM), a VBEM/Observer hybrid option, and a <100% verification coverage option. The option to require VBEM would have required video-based electronic monitoring equipment to ensure compliance with MR provisions if such provisions are established in Amendment 5. Portside samplers would have certified and reported the weight and species composition of each landing which would have been compiled, audited, and summarized, and VBEM data would have been checked subsequently to reconcile landings against fishing activity to verify compliance with maximized retention requirements. Under the VBEM/Observer hybrid option a combination of VBEM and monitoring by at-sea observers would have been used to verify maximized retention. Potential sub-options could have included allowing industry to choose which verification vector to employ. Under the <100% verification coverage option, verification of maximized retention would not occur 100% of the time, and self-reporting would be relied upon for assurances that landed weight is equal to catch. These options were considered to be under-developed and infeasible due to difficulties in implementation.

- Three options that would have phased-in the implementation of maximized retention. The first would have been a temporal phase-in of MR provisions over two to four years, which would have included a gradual but steady reduction in the amount of at-sea discarding that is permitted. The second would have implemented a spatial phase-in of MR provisions, in which bycatch "hotspots" (for example, areas with river herring bycatch or groundfish closed areas) would have required maximized retention. Areas could be added/modified as additional data become available. The third option would have implemented a gradual phase-in of VBEM as the verification system for MR through pilot programs. These options were considered to be under-developed and infeasible due to difficulties in implementation.

- Two options that would have addressed non-permitted catch under maximized retention.
    - The first option would have required modified maximized retention, in which VBEM would be used to monitor minimal at-sea discards. Modifications to the at-sea components of a CMCP would have specified that any at-sea discards must be disposed of through a designated discard chute with monitoring through an additional camera close enough in range to distinguish species, and wide-angle deck-wide and rail-area cameras would have monitored pre-sorting, and imagery analysis would have been conducted. The option could have been applied for specific species for which no regulatory relief is possible and certain prohibited species, for instance marine mammals or birds. Two concerns were raised with this measure. The first concern was that current technology may not be able to accomplish the objectives of the measure, as it has not been tested in the fishery. The second was vessels would discard the non-permitted species if the electronic monitoring technology was on board. It was therefore considered not feasible at the time of the amendment.

- The second option would have implemented landings caps by allowing the landing of non-permitted catch (for species to which maximized retention applies), including in excess of current trip limits, with such landings subject to the appropriate landings caps. Landings caps for each species subject to maximized retention provisions would have been set annually by the Council based on either available observer and portside sampling data which would have documented bycatch of the species in question by herring vessels subject to maximized retention and would have been expanded upwards to account for expected effort in the fishery during the upcoming fishing year, or another option that was TBD. Once landed, the fish would have been counted against the landings cap and either haddock catch cap provisions would have applied to the sale of the catch that counts towards a landings cap, or the vessel would have been able to sell the fish to any dealer with a federal permit for the species in question. When the first species-based landings cap is reached, the directed fishery for Atlantic herring would have closed, and all vessels would have been limited to a possession limit of 2,000 pounds in all management areas. Both NERO and NEFMC staff expressed concerns that the measures above do not address regulatory issues associated with landing non-permitted species. The capping of landings and closing the fishery when the cap is reached also seemed somewhat inconsistent with the intent of a maximized retention program.

- Two options that would have verified compliance with maximized retention. The first would have utilized 100% Verification by At-Sea Observers; under the option, NMFS-approved observers would have certified compliance with maximized retention requirements and sampled any at-sea discards that did take place, but the vast majority of catch sampling would have been done dockside, as would the certified weighing or certified volumetric estimation of landed weight. This option was considered infeasible. Under the second, the Council would have developed standards and management measures to ensure compliance with maximized retention provisions. These standards would have been implemented in Amendment 5 and would have applied to all Category A and B vessels. This measure was carried over from one of the stakeholder proposals and is redundant, given the other options under consideration in the document.

Maximized retention across the fishery was ultimately placed in this considered but rejected section due to the complexity of the implementation issues with the various options listed above. Many of the species that would have been retained under these measures are managed under other FMPs or other management bodies (such as the MAFMC or NMFS for those species that are considered protected resources). The NMFS staff raised concerns about the difficulty in having to amend multiple FMPs to address these measures, as well as create a manner in which species could be retained despite their prohibition from being landed.

4.3 MEASURES TO ADDRESS PORTSIDE SAMPLING

The Herring Committee/Council considered several different approaches to developing a portside sampling program for the herring fishery during the development of Amendment 5, all of which were eliminated by the January 2011 Council meeting. During the January 2011 meeting, the Council voted to remove the remaining portions of the Measures to Address Portside Sampling in favor of the proposed requirement for dealers to weigh all fish.

One of the options that was originally considered would have achieved Council-identified priority target levels of precision using a combination of at-sea and dockside sampling; however, the details of this option remained unclear during the development of the amendment. Different approaches would have been used to determine coverage levels for at-sea monitoring and portside sampling based on the objectives of both programs. Further analysis by the Herring PDT, however, indicated that the two

programs could not be combined at the time and that the data generated by the two programs are not additive, and that different approaches should be used to determine coverage levels for at-sea monitoring and portside sampling based on the objectives of both programs.

One set of options addressed coverage levels for the portside sampling program. One option would have required <100% portside monitoring coverage without extrapolation, which would have meant that the coverage rate and coverage design would not have allowed for the extrapolation of observed landings across the entire fleet such that unobserved landings had a bycatch rate applied. Another option would have required a coverage level equal to the SBRM coverage. Another option would have required a coverage level to meet council priorities which would have entailed a 30% CV on catch/bycatch estimates for Atlantic herring and haddock, and a 20% CV on catch/bycatch estimates for river herring. In that option NMFS would have determined levels of coverage for portside sampling based on the level of observer coverage and the expected CVs that would result from the observer estimates, and portside sampling data would supplement the observer data. This option was considered in the context of developing a combination portside/at-sea sampling program. Further analysis by the Herring PDT indicated that the two programs could not be combined at this time and that the data generated by the two programs are not additive. Different approaches should be used to determine coverage levels for at-sea monitoring and portside sampling based on the objectives of both programs. Options were also considered to set portside sampling coverage less than 100% with extrapolation of bycatch estimates to the entire fishery. When the PDT expressed concern about requiring extrapolation, given the current variability associated with the data, the Herring Committee agreed that alternate approaches should be considered for portside sampling coverage levels, which were eventually rejected when the portside sampling program was removed from consideration.

Another set of options would have addressed the determination of qualified service providers for the portside sampling program. One of the options would have standardized the existing state portside sampling programs and incorporate them into the proposed action by certifying them as approved portside sampling program (PSP) vendors. Another would have implemented immediate or phased-in use of NEFOP observers as portside samplers for the proposed action, which would have essentially certified the NEFOP as a PSP vendor. A different option was to implement a single-service provider plan for PSP operations which could not be covered by shore-based observers employed by state or federal agencies. The final option addressing service providers would have implemented a multi-service provider plan for PSP operations which cannot be covered by shore-based observers employed by state or federal agencies. These four options were rejected when the decision was made to have this amendment be consistent with other FMPs, such as Scallops and Groundfish, by allowing multiple service providers. When the portside sampling program was removed by the Council, the multiple service provider requirements were no longer needed for the portside sampling program portion of the Amendment. These were similar to other FMPs except that Amendment 5 would have authorized the ASMFC States (ME-NJ) as approved service providers for Federal portside sampling programs.

As part of the portside sampling program, the Council considered several alternatives to verify catch estimates through a third party. The alternatives to confirm the accuracy of self-reported catch that were considered but rejected are described below.

The Committee/Council considered a set of alternatives that would have addressed the accuracy of self-reporting in the fishery using scales. A few of the options would have required the weighing of dealer trucks and/or transport vehicles as a condition of possessing a Federal dealer permit for Atlantic herring. The trucks would have been weighed either annually or before being loaded with herring as a baseline weight, and again after being loaded. The total weight of herring would have been calculated as the difference of the two weights and reported to the NMFS. The option would have required that all weights be taken by a Licensed Weighmaster, that the scale be inspected regularly, that any trucks utilizing

containers on flatbed trucks have the containers present at the initial weighing, and that the required paperwork be present when needed at the weighing.

The options differed in the location and ownership of the scales that would have weighed the trucks and/or transport vehicles. The first option would have required the installation and use of the truck scales in all ports. This measure was considered infeasible due to the need for land, manipulation of lands, and structures needed to install the truck scale, as well as the financial implications. The second measure, which would have installed truck scales in specified ports, was also considered infeasible for the same reasons. The third option would have required the use of pre-existing scales owned by various parties in locations close to the ports of landing. This option was rejected for several reasons, including objections from the Regional Office regarding the feasibility of the measure at that level and similar objections from the Advisory Panel regarding the cost and complications to the herring offloading and transport process. The measure also appeared to fail in support the goals of the catch monitoring program as it is established in this amendment.

Another option to address the accuracy of self-reporting option would have required flow scales and their use on herring vessels as a condition of possessing the limited access permit for limited access Category A, B, and C vessels, as well as herring carrier vessels. Flow scales are used in conveyor systems where there is a continuous flow of material, such as herring. Flow scales determine an accurate weight of total landings using a weight sensor that the fish pass over as they move down the conveyor belt. The option would have required accordance with a NMFS list of approved scale models, initial and annual inspections for all scales, daily at-sea scale tests, scale maintenance, retention of daily printed reports from the scales, and scale location on each vessel. This measure was rejected primarily due to the initial cost of the scales combined with the difficulty and cost in maintaining the scales thereafter. Although the scales have been used in the Fisheries of the Exclusive Economic Zone of Alaska, the Committee/Council considered that those fisheries operated differently and were subject to 100% observer coverage. Similar to the weighing of trucks and/or transport vehicles, the measure also appeared to fail in support the goals of the catch monitoring program as it is established in this amendment. For additional detailed information on the difficulties faced in implementing the use of flow scales and truck scales in the fishery, see the Council Staff discussion document (Appendix I, Volume II) entitled *Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery.*

In later drafts of the document, one alternative that was considered but rejected would have required the sealing and certification of vessel fish holds or the use of standard fish totes, depending on the option, to verify self-reporting. If the first option under the alternative had been chosen, it would have required that herring Limited Access Category A and B vessels and all herring carrier vessels seal and certify the volume of their fish holds using an accredited party such as the State Sealer of Weights and Measures. An independent third party from the portside sampling program would have then been required to conduct a "sounding" process, by which the sampler drops either a small weight connected to the end of a tape measure or similar device into the hold until it settles on top of the fish to obtain a more accurate estimate of catch. Under the second option Limited Access Category C vessels would have been required to do one of two sub-options. The first sub-option offered the vessel to either certify the volume of their fish holds (as was described for Category A/B vessels and carriers) or keep all herring stored independently if the vessel does not utilize a pump. The second sub-option would have required vessels to hold all herring caught in standard sized fish totes on all fishing trips. Weight verification of landings would have been conducted by an independent third-party as a part of the portside sampling program, as described for the first sub-option if the sealing and certification was chosen, or by a count of the standard fish totes which would then be multiplied by the number of totes to achieve weight verification under the second sub-option. The other alternative considered in later drafts of the document would have required herring dealers to have transport trucks sealed and certified, as well as had third party verification of resulting

measurements in connection with the portside sampling program, similar to the first option under the first alternative.

When the portside sampling program was removed from consideration by the Council, it had been clarified from its original form. The sampling design was to be specified by NOAA Fisheries (through the NEFSC), in consultation with the Herring PDT, Council, and ASMFC, on an annual basis based on Council priorities set in Amendment 5. Approved portside sampling program service providers NOAA Fisheries would have worked together to ensure that vessels were met by samplers when specified by the priorities. The portside sampling and trip selection priorities were focused on sampling those offloads that had at-sea observers aboard or those which were subject to catch caps, collecting information for stock assessments including spawning condition, and on sampling trips that occurred in river herring monitoring/avoidance areas and groundfish closed areas. It had four options for target coverage levels (10%, 25%, 50%, and 100%) and the sampling protocol methods had been outlined for processing plants, the commercial catch sampling (for assessment purposes) as well as for whenever possible.

As was stated previously, the portside sampling program was ultimately removed from the document in favor of a requirement for dealers to weigh all fish. This removal was prompted in part by concern from the NMFS about the resources that were available to aid in the creation and running of a portside sampling program. Despite the potential options in the document in which the industry (vessels, dealers, or both) would provide the funding, the resources needed by NMFS to aid in the effort were limited, and the potential for the program to fail existed if the funding was insufficient, or if it were to become insufficient in the future.

4.4 OPTIONS TO MAXIMIZE SAMPLING AND ADDRESS NET SLIPPAGE

During the development of the Amendment 5 catch monitoring program, several additional options were considered to maximize sampling by NMFS-approved observers and address net slippage. Three options were eliminated from further consideration for maximizing sampling and three for addressing net slippage.

One of the options to maximize sampling would have been an interruption prohibition, in which the removal of the pump from the codend once pumping has been initiated would have been prohibited unless the vessel was able to lift the net from the water and demonstrate in a visible way that the codend was either empty or was re-pursed before being placed back in the water. This measure was deemed to be infeasible for many operations. The second option would have required vessels to lift the codend from the water to visibly demonstrate that it was empty prior to re-setting the net, but was also deemed to be infeasible for many operations. The third option would have been to determine (and apply) minimum portion of a slipped catch that would be required to be pumped on board a vessel to ensure complete sampling. If a minimum portion/threshold could have been determined, then the measure would have required sampling at that level for any slipped tows. The Herring PDT expressed concern about the feasibility of this measure because it was not clear how a percentage could be determined to ensure complete sampling from a slipped catch without further research and investigation, and the measure was not clear in its intentions. The PDT advised that fish may stratify in the net if it sits for any length of time, and that a study was needed to determine the appropriate percentages.

The Council also considered an option to require flow scales on processing vessels, but eliminated this option from consideration in Amendment 5 because there are currently no at-sea processing vessels in the fishery or expected to participate in the fishery in the near future. As a result, the Council determined that time and resources should be focused on more pressing issues related to catch monitoring in Amendment

5. The Council may address issues related to monitoring catch on at-sea processing vessels through a separate action in the future if the need arises.

As for measures to address net slippage, the first option would have set slippage caps, and Committee/Council considered and rejected a series of sub-options under that option, with the intent to better account for and minimize slippage events. Slippage caps would have been set annually by the Council for the entire fishery, and deductions would have been made based on slippage events documented by either a NMFS-approved observer or an adequate monitoring mechanism (VBEM, for example) in recent years. When the slippage cap was reached, the directed herring fishery in all management areas would have closed, and all vessels would have been limited to 2,000 pounds of herring. A series of sub-options could have been applied to this measure:

- Available information about slippage from observer data could have been expanded upwards to account for expected effort in the fishery during the upcoming fishing year.
- Available information about slippage from observer data could have been expanded upwards to account for expected effort in the fishery during the upcoming fishing year. The cap would have then been adjusted downwards based on the expected level of observer coverage for the upcoming fishing year (similar to the Framework 43 approach for setting the haddock catch cap).
- Available information about slippage could have been used to estimate the number of slippage events that may have been expected to occur across the fishery in the upcoming fishing year. An average estimate of slipped catch (based on observations in recent years) would have been applied to the number of slippage events to generate a total slippage cap.
- A sub-option that could have gradually reduced the slippage cap over time under any of the approaches described above for setting the cap (would have applied to all sub-options above).
- A deduction from the slippage cap that would have occurred every time a slippage event was documented by either a NMFS-approved observer or an adequate monitoring mechanism (VBEM, for example). When the slippage cap was reached, the directed herring fishery in all management areas would have closed, and all vessels would have been limited to 2,000 pounds of herring.
- An assumed tonnage for each slippage event would have been applied against an overall cap on slippage in the fishery under this sub-option. The assumed amount deducted for each slippage event would have been set at the current best estimate for the average tow in the fishery (approximately 65 mt). When the slippage cap was reached, the directed herring fishery in all management areas would have closed, and all vessels would have been limited to 2,000 pounds of herring.
- An estimated tonnage for each detected slippage event would be applied against an overall tonnage cap on slippage in the fishery under this sub-option. The estimated amount would have been based on an independent measure of the total weight of the slipped discards. Captain's estimates would not have been accepted. Therefore, this option have been only be practical in cases in which the VBEM dataset provided a clear and acceptable estimate of weight, or in which the vessel had additional EM technology such as catch-weight sensors in the CMCP, or in which a NMFS-approved observer happened to be aboard. Under this option, slippage events for which additional information to estimate slipped catch was not available from a third party would have been subject to the assumed tonnage application described in the option above. When the slippage cap was reached, the directed herring fishery in all management areas would have been closed, and all vessels would have been limited to 2,000 pounds of herring.

In general the Herring PDT did not support the establishment of slippage caps at the time of development and recommended that the measures be implemented through a framework adjustment in the future, as no statistically valid approach was in existence for estimating slippage or a slippage cap at that time. Some concerns from the Herring PDT include the worry that a slippage cap would only address a small

proportion of "released catch" events and may be relatively ineffectual at motivating the herring fishery to take greater care to avoid non-target species; that developing a statistically valid method that addresses these issues may require months or years and involve resources beyond those immediately available to the Herring PDT; that due to the expansion of the estimate of total slippage in the herring fishery from sampled slippage events collected by observers to the entire fishery, the resulting estimates will have some amount of error associated with them, the extent of which is unknown; and that the population level effects of slippage events are currently unknown, and the measure would therefore have an unknown relationship to total mortality for the herring complex.

Two other options that the Council/Committee considered for addressing net slippage would have implemented species specific landing caps. The first option would have applied *assumed* slippage event tonnage against species-specific slippage caps, and the second option would have applied *estimated* slippage event tonnage against species-specific slippage caps**.** Under both options, individual species-specific slippage caps would be set annually by the Council for each species identified for maximized retention, and the individual species slippage caps would be set at biologically-appropriate levels with consideration of economic and other concerns of all other fisheries targeting those species.

An assumed tonnage would have been applied against the herring sub-ACL for the management area in which the event occurs, *and* against each species-specific slippage cap for the first option, but an estimated tonnage would have applied for the second option. Under the first option, the assumed amount would have been set based on the current best estimate for the average tow in the fishery. Under the second option, the estimated amount would be based on some independent measure of the total weight of the slipped catch by species. Captain's estimates would not have been accepted. Therefore, this option would have only been practical in cases in which the VBEM dataset provided a clear and acceptable estimate of weight, or in which the vessel had additional EM technology such as catch-weight sensors in the CMCP, or in which a NMFS-approved observer happened to be aboard. In both options, when the first species-specific slippage cap was reached, the directed herring fishery in all management areas would have closed, and all vessels would have been limited to 2,000 pounds of herring.

After further consideration the first option was considered unrealistic based on time and resource restraints, and it was recommended that this option be eliminated. The second option was moved to the considered but rejected section because suspected or inferred slippage or discard events would still be subject to the assumed tonnage application because by definition, no actual data would exist for these events.

The Council/Committee also considered two potential consequences for quota or bycatch cap overages. Under the first option, if an at-sea discard caused an overage, or an at-sea discard event was suspected/inferred based on VBEM data or absence of data, and the event was known or suspected to have caused resulted in a quota or bycatch cap overage, then the offending vessel would have been suspended from the herring fishery for the following fishing year, and all other vessels would be forced to pay back the overage. The offending vessel also would have been forced to carry an at-sea observer at its own expense, in addition to participating in the maximized retention and dockside monitoring program under the proposed action, for an additional probationary year. This option was deemed problematic from a legal perspective. Under the second option, vessels would have been required to terminate their trips and return to port in the event that slippage event occurs due to the potential to compromise vessel safety and/or a mechanical failure. This option would have been applied on trips where slippage events can be documented with certainty (i.e., trips with either a NMFS-approved observer on board or other adequate monitoring mechanism like video technology). The Committee considered this measure to be punitive, and it was not expected to provide incentive to minimize slippage. The Committee was also concerned about the measure's potential to compromise safety when catch is brought on board in unsafe conditions in order to avoid trip termination.

4.5 MEASURES TO REQUIRE ELECTRONIC MONITORING

The one option that was considered but rejected by the Council/Committee for requiring electronic monitoring was a measure that would have required a height or bottom contact sensors on Category A, B, and C trawl vessels to determine the amount of bottom contact of trawls during each tow. Under this option members of the midwater and pair trawl and purse seine sectors would have been responsible for working with NMFS to develop and test systems that can monitor bottom contact and report this data, via VMS or otherwise. The NERO office expressed concern about this measure, noting that it was not clear how the data would be collected or analyzed. Concerns were also raised by the Committee regarding the cost of the equipment and potential contact with the bottom, which could damage or remove it.

4.6 MEASURES TO REQUIRE CATCH MONITORING AND CONTROL PLANS

During the development of the Amendment 5 catch monitoring alternatives, the Council considered measures that would require the industry to design and submit catch monitoring and control plans (CMCPs) to NMFS. CMCPs would have had the standards specified in the amendment which would have outline requirements for each CMCP and may have included the following: sorting and weighing all landings under the oversight of a portside sampler, notification requirements in advance of a landing, use of approved scales or other weighing techniques, provision of safe and convenient access points and sampling locations for observers/monitors/samplers, and procedures to ensure that no unobserved pre-sorting occurs, possibly including details regarding the installation and operation of a video-based electronic monitoring (VBEM) system if one is required. CMCPs would have covered all possible offload scenarios, and may have included cooperative arrangements with dealers and/or carriers and/or receivers of at-sea transfers (including USAP vessels if necessary and appropriate) or management measures to address river herring bycatch could also have been specified in the CMCP.

Options for CMCP provisions that were considered by the Council during the development of Amendment 5 include an option that would have determined which sectors of the fishery to which CMCP requirements could have applied. The other option would have defined the required elements of the CMCPs, such as an outline of fish handling procedures in detail, an explanation of how independently verifiable weight or volumetric conversion would have been attained for all species, an outline of the VBEM system to be operated and its installation specifications (if VBEM is a component of the catch monitoring program), an outline of the procedures for the portside component, or mandatory verification of compliance with maximized retention requirements.

It was intended that individual vessels/entities or groups of vessels/entities could develop/submit CMCPs. NMFS would review/approve CMCPs with input from the Council on an annual or semi-annual basis as part of the fishery permit renewal procedures. CMCP options were ultimately rejected from further consideration because of concerns expressed by the NMFS Regional Office about lack of clarity/detail in the proposed CMCP standards and the possibility of generating numerous different monitoring plans, which could cause significant enforcement/compliance problems. The proposed CMCP provisions appeared to be too open-ended and would allow for the potential for many different approaches to addressing some issues to be submitted by the industry.

4.7 OPTIONS FOR FUNDING

One alternative for funding the measures in Amendment 5 was to implement a set-aside, which would have been administered by mirroring the set-asides operated in other fisheries. One option under the alternative would have been to eliminate the research set-aside and replace it with the catch monitoring set-aside, with the sub-option of utilizing the set-aside specifically to fund a portside sampling program. Another option was to establish a catch monitoring set-aside in addition to the RSA, with the sub-option of utilizing the set-aside specifically to fund a portside sampling program PSP. A third option was to identify catch monitoring as a top priority for the RSA.

The first two options, which would have established a catch monitoring set-aside was rejected because NERO had expressed significant concerns about establishing an RSA-type process for funding a catch monitoring program. The NERO concerns were communicated to the Committee:

- The alternatives proposed in the document to fund catch monitoring through a set-aside are similar to the current research set-asides (RSAs). The RSA process is a competitive grants process administered by the Northeast Fisheries Science Center. Proposals are requested for research, and incoming proposals are reviewed and ranked by a technical body. With competitive grants awarded through this process, different entities will apply. For catch monitoring, it is important to ensure that only qualified entities apply, and it would be difficult to ensure a consistent monitoring program with multiple entities potentially competing for the available funds in any given year.
- Available funds to utilize under a catch monitoring set-aside would be limited and uncertain. Not all of the herring quotas are fully utilized. Set-asides have potential to be utilized only in areas where the quota is fully utilized and the fishery closes. The set-aside, therefore, would be limited to only the areas that close regularly (1A and possibly 1B) and could vary in amount from year to year depending on the total quota and the percentage selected for the set-aside. Overall, funds generated from the set-aside may not be significant.
- Timing is an important consideration. For a set-aside process to become effective, there is a one-year lag time to generate the funds. Timing is important for the fishery as well; there have been instances with past set-asides where fish were awarded but circumstances prevented those fish from being harvested and funds being generated. There are also substantial vessel costs associated with harvesting a set-aside; these costs must be factored into consideration of how much funding a set-aside could generate.
- Herring is a relatively low value fish. The costs of administering a set-aside program and harvesting fish under the set-aside may preclude the ability to generate a significant amount of funds.

The third option was sent to the considered but rejected section, but still could be implemented when the priorities for the RSA are set; there is no need to specify priorities for the RSA in this amendment. In addition, there are still two options in this amendment which would address the issue in part by prioritizing VBEM.

The Council also considered an option for catch monitoring in the herring fishery to be funded by federally permitted dealers. After some discussion with NMFS and NOAA General Counsel, the Council eliminated this option from consideration in Amendment 5 because it was vague and appeared to be infeasible since the vast majority of measures in Amendment 5 relate to monitoring catch at-sea. It is unclear how a mechanism could be established/structured to require dealers to fund at-sea catch monitoring on specific vessels (limited access) in the fishery.

4.8 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

The Committee/Council originally considered measures that would address river herring bycatch in the Atlantic herring fishery that would be applied to a series of river herring "hotspots", which were to be in quarter degree square increments. The alternatives considered had two purposes: (1) identifying the river herring hotspots (seasonal times and areas); and (2) management measures that will apply in the river herring hotspots.

In total there were three alternatives which identified the river herring hotspots. All three alternatives utilized a step-wise approach to identifying hotspots, whereby a first group of hotspots are identified bimonthly based on observer data from 2005-2009, coined Stage 1. The Stage 2 hotspots were identified based on criteria applied to the entire time series of NMFS bottom trawl survey data and an analysis method that involved the probability of occurrence in a tow in that data and a catch intensity measure, also in that data.

The Stage 1 hotspots were to be established upon the implementation of Amendment 5, and management measures to address river herring bycatch would have applied to the Stage 1 hotspots. The management measures to address river herring bycatch would have applied to the Stage 1 hotspots unless a specified trigger is reached, whereby a second group of hotspots, coined Stage 2, would become effective. If the Stage 2 hotspots were triggered, the management measures to address river herring bycatch would have applied to both Stage 1 and Stage 2 hotspots for the remainder of the fishing year.

All three alternatives to identify the river herring hotspots only varied from each other in that they considered three different amounts of river herring catch in a tow (on an observed "directed herring trip", which meant any trip that caught more than 2,000 pounds of Atlantic herring) that would have triggered the Stage 1 and Stage 2 hotspots: 40 pounds, 129 pounds, and 1,233 pounds.

The second set of alternatives that were the management measures to apply to the hotspots would have been applied when one of the three previously mentioned triggers were reached. There were eight alternatives that would have applied:

- A no action alternative, in which catch monitoring would only improve through other actions in Amendment 5;
- An action which would apply management measures in river herring hotspots similar to those for herring vessel access to Closed Area I based on the Final Rule for the Closed Area I provisions, published on November 2, 2009;
- An action the same as the previous, with the with the exception of the requirement for 100% observer coverage in the areas;
- An action that was coined the "move-along" rule, in which vessels would be prohibited to fish within a hotspot if the river herring bycatch in any tow within that hotspot were to exceed the threshold, with the requirement of 100% observer coverage in the hotspots to monitor river herring catch
    - Three thresholds for the move along rules (50 pounds per trip, 500 pounds per trip, and 2,000 pounds per trip) also considered as options, as well as two move-along closure time periods (one or two weeks);

- An action the same as the previous, with the with the exception of the requirement for 100% observer coverage in the areas, and priority was to be placed, to the extent possible, on deploying (NEFOP or other NMFS-approved) observers on trips that may fish in the river herring hotspots
    - The thresholds were only to apply to trips with observers on board;
- An action in which a bycatch avoidance program would have been implemented through a framework adjustment to the FMP, which would have been based on information provided by a similar Sustainable Fisheries Coalition Bycatch Avoidance Program once it had been completed, including information on the mechanism and process for tracking fleet activity, reporting bycatch events, compiling data, and notifying the fleet of changes to the hotspot area(s), the threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of the area(s), and the distance and time that vessels would be required to move from the area(s)
- An action that would have closed the river herring hotspots to fishing unless the vessels could have demonstrated river herring bycatch avoidance through catch monitoring and control plans (CMCP), in which NMFS would have reviewed/approved CMCPs with input from the Council on an annual or semi-annual basis as part of the fishery permit renewal procedure (See Section 4.6 for more information on CMCPs);
- An action that would have prohibited fishing for herring in Stage 1 River Herring Hotspots, removing the ability of vessels to fish for herring in the hotspots, thereby eliminating the need for Stage 2 hotspots.

In all eight of the considered measures to apply to the hotspots, transfers at sea would have been prohibited within the hotspots, and modifications to those management measures would have been allowed through a future framework adjustment to the herring FMP. There were also two options that could have applied to all eight of the measures, one of which would have meant that the measures would have applied to only Limited Access Category A, B, and C vessels when on a declared herring trip, and the second in which the measures would have applied to all herring vessels (Categories A, B, C, and D).

The Herring PDT was encouraged by the Committee and Council to streamline the alternatives, and the PDT agreed that the measures should be ecologically based, simple to understand, enforceable, and connected to the other management measures in Amendment 5. These four criteria had been raised by the Committee, Council, and PDT alike as issues with the alternatives as they have been described above. The issues were based on concerns that the data did not have the ability to predict what small amounts of movement by vessels out of a hotspot would produce, the complexity of the measures and the ability of all parties involved to understand them, safety issues that that resulted from the potential for observers to become enforcers when having to determine when the river herring triggers had been reached.

A restructuring of the hotspot alternatives was therefore recommended to the Committee by the Herring PDT, and the Herring Committee and Council utilized the restructuring in their decisions. The current measures under consideration in this document therefore reflect the outcome of further work on these alternatives to improve the measures to address river herring bycatch in the Atlantic herring fishery. For further information on this process and the current measures, see Volume II, Appendix IV, entitled "Herring PDT Analysis: Development of Measures to Address River Herring Bycatch."

After the restructuring, the two options for "move-along" rules (one considering 100% observer coverage and the considering less than 100% observe coverage) were removed from consideration by the Council. The removal was based on several problems that the NERO and Council staff had identified, including a significant delay (1-3 weeks) between when the vessel catches the river herring trigger amount and when NMFS can close the area where the trigger was located, as the measure would need to be implemented by the publication of notification in the Federal Register. The time-lags were also likely between when river

herring may be encountered on a trip in an area to when a rule may be implemented to close the "move-along area", which in turn could have reduce the effectiveness of the move-along rule and create a significant administrative/regulatory burden. Implementation of multiple move-along rules within the same areas and the same time periods was also not likely to be feasible. Flexibility of the measure was also questioned, and the ability of fleets to organize, communicate, and manage its bycatch interactions in the most effective manner possible would not have been possible. For these reasons, the measures were removed from consideration.

4.9 OTHER MEASURES CONSIDERED BUT REJECTED

The Committee/Council considered several different approaches to developing measures to establish criteria for midwater trawl vessel access to groundfish closed areas during the development of Amendment 5. One of the measures would have required 100% observer coverage for one year as a condition to gain further access to the closed areas when a vessel targeting herring in a groundfish closed area has regulated groundfish exceeding 1% of the catch of herring. The vessel would have been denied access for one year if the 1% bycatch allowance had been exceeded again. This measure was rejected because of due diligence issues raised by the NMFS Regional Office; if a vessel is able to show that it used reasonable care to prevent the offence from occurring, then access cannot be denied.

5.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The Affected Environment is described in this document based on valued ecosystem components (VECs) that are identified specifically for Amendment 5. The VECs for consideration in Amendment 5 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 of an EIS since they are the "place" where the impacts of management actions are exhibited.

5.1 ATLANTIC HERRING

The NEFMC manages herring under the Atlantic Herring FMP. The stock is not overfished at this time and overfishing is not occurring. 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.

5.1.1 Distribution and Life History

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). Adult Atlantic herring are found in shallow inshore waters, 20 meters deep, to offshore waters up to 200 meters deep (NEFMC 1999; Munro 2002), but seldom migrate to depths more than 50 fathoms (300 ft or 91.4 meters) (Kelly and Moring 1986). They prefer water temperatures of 5^{o} – 9^{o} C (Munro 2002; Zinkevich 1967), but may overwinter at temperatures as low as 0^{o} C (Reid et al. 1999).

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). Herring are synchronous spawners, with mature fish producing eggs once a year. Male and female herring grow at about the same rate and become sexually mature beginning at age 2, with most maturing by age 4 (O'brien et al. 1993, Munroe 2002). Growth rates vary greatly from year to year, and to some extent from stock to stock, and appear to be influenced by many factors, including temperature, food availability, and population size.

In the past, the herring resource along the east coast of the United States was divided into the Gulf of Maine and Georges Bank stocks (Anthony and Waring 1980). Currently, however, no methods are available to identify stock of origin for fish caught in the mixed stock fishery or during fishery-independent surveys. Consequently, herring from the Gulf of Maine and Georges Bank components are combined for assessment purposes into a single coastal stock complex.

5.1.2 Migration

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. Tagging experiments provide evidence of intermixing of Gulf of Maine, Georges Bank, and Scotian Shelf herring during different phases of the annual migration, which is described in greater detail in Amendment 1. Below are two more recent tagging projects which provide insight into the migration behavior of Atlantic Herring.

5.1.2.1 Maine DMR Tagging Project

In 2009, the results of the project presented in Amendment 1 were published (Kanwit and Libby, 2009), and are summarized below. The results show seasonal movements of Atlantic herring from Southern New England in the winter to Nova Scotia in the summer.

Between 2003 and 2006, a total of 85,561 T-bar tags were used to mark herring (Table 7); due to funding, however, the tagging did not occur at regular intervals. Herring were tagged in the GOM during the summer feeding and spawning period (July-October) and in SNE during the winter feeding period (January-April), as these are the times and areas where herring are assumed to have some residency.

Table 7 Number of Herring Tagged by Year, Spatial and Temporal Strata 2003-2006

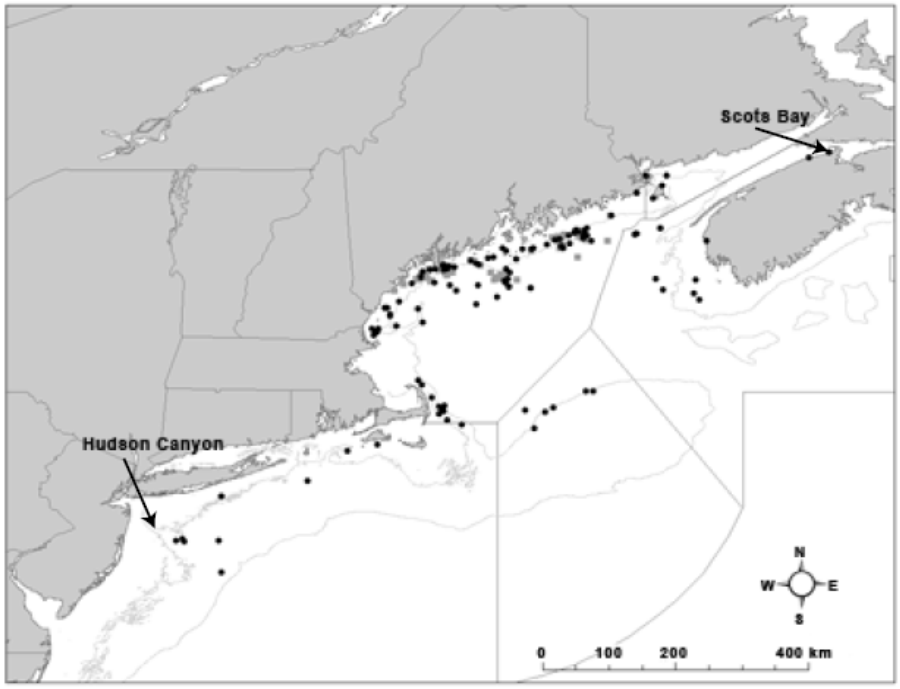
		Year				
Spatial strata	Temporal strata	2003	2004	2005	2006	Total
Gulf of Maine (GOM)	Summer Feeding/Spawning (SFS: July–October)	15 275	13 475	5 300	6 100	40 150
Southern New England (SNE)	Winter Feeding (WF: January–April)	4 536	5 875	20 000	15 000	45 411
Total		19 811	19 350	25 300	21 100	85 561

Source: Kanwit and Libby, 2009

Commercial purse seine vessels and midwater trawl vessels were used for the initial tagging, and a lottery system was used to entice fishermen to return tags. A seeding study was conducted to inform adjustments of reporting rates. Time and distance plots were first made with the resulting data, and adjustments for fishing effort were made.

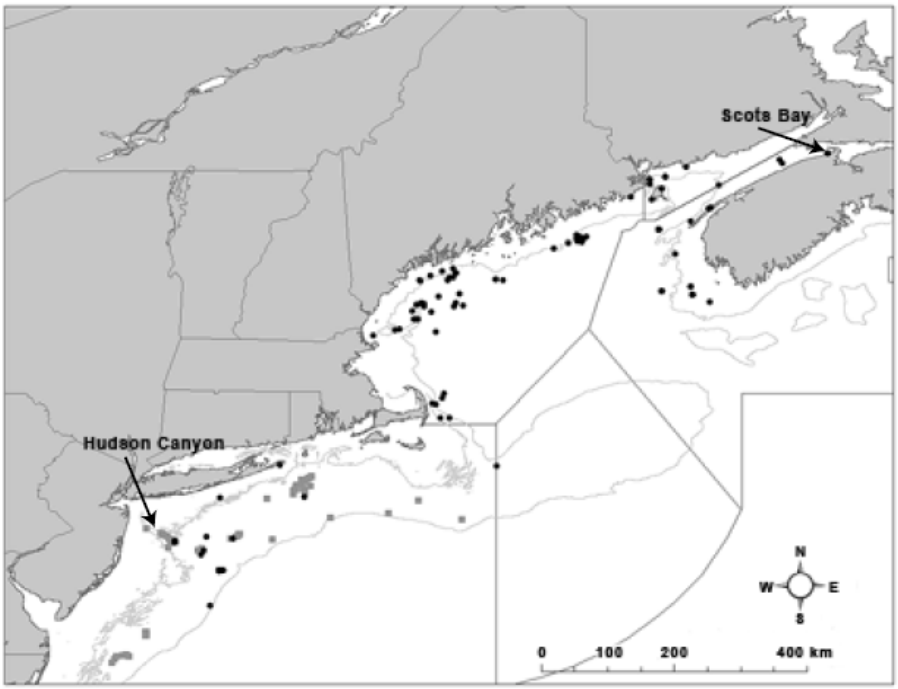
Tag returns occurred in a large range from as far North and East as Scots Bay in the Bay of Fundy to as far South and West as Hudson Canyon off the New York coast (Figure 26 and Figure 27).

Figure 26 Tagging Locations (gray dots) and Returns (black dots) from Atlantic Herring Released in the GOM During the Summer Feeding and Spawning



Source: Kanwit and Libby, 2009

Figure 27 Tagging Locations (gray dots) and Returns (black dots) from Atlantic Herring Released in SNE During the Winter Feeding



Source: Kanwit and Libby, 2009

Fish that were tagged aboard purse seine vessels had a significantly different, although small, return rate from midwater trawls vessels; fish tagged on purse seine vessels were more likely to be returned.

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. Most were recaptured close to the point of release close to a year later in the GOM (only 6 recoveries were after one year at large, however). In comparison, those tagged in SNE during the winter feeding time period did not stay in the area for as long, but were back in the same area quicker than those released in the GOM. The fish released in the GOM traveled an average of 134 km with a minimum of 1 km and a maximum of 684 km; those released in SNE traveled and average of 362 km with a minimum of 2 km and a maximum of 1,008 km. This study concurs with several other studies in similar areas at similar times.

5.1.2.2 German Bank Spawning Ground Turnover Rates

In 2009, a joint project was undertaken by both the Herring Science Council and the Department of Fisheries and Oceans to investigating the average residency of Atlantic herring on spawning grounds during the spawning season. The latest report from the three year study covers the first year of tagging (2009); subsequent results from 2010 and the present year will be published at a later date.

Residency is defined as the length of time a herring takes to aggregate, spawn, leave, and for a new wave of herring to arrive. Previous to this study the assumption has been a 10-14 day residency, which is used to estimate Spawning Stock Biomass in assessments. A new study was warranted to better estimate sub-populations and to corroborate acoustic survey results.

In 2009, 10,338 Floy tags were deployed continuously during the spawning season on German Bank; 15 separate events took place from August to September. Herring were collected on commercial purse seine vessels and only ripe and running fish were tagged. 100-200 additional herring were retained for further information on length frequency and laboratory analysis. A lottery was utilized to encourage tag returns by fishermen, and returns were adjusted to account for effort.

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. Of a total of 10,338 tags released in 2009, 69 tags were recaptured, and 52% were recaptured in the first week, 78% by the second week, and 93% by the third week. No relationship was found between the distance travelled and the days at large. A regression analysis showed that the proportion of recaptures on the spawning grounds and the days at large were highly correlated.

5.1.3 Stock Definition

Currently, the Atlantic Herring resource is managed as a single coastal stock complex, although three spawning stock components occupy three fairly distinct locations in the Gulf of Maine region in the Gulf of Maine region: the southwest Nova Scotia-Bay of Fundy, the coastal waters of the Gulf of Maine, and Georges Bank. A more detailed description of this stock definition can be found in Amendment 1. A more recently completed thesis by Bolles (2006) used morphometrics to investigate mixing rates between these three spawning components during spawning times.

Truss network analysis, which is a systematic set of morphometric distances, was used in combination with image analysis and multivariate procedures to build on work done by Cadrin and Armstrong in 2001. Canadian herring were sampled using commercial purse seines, and Gulf of Maine and Georges Bank were sampled using mid water trawls. Sampling took place during the 2003 and 2004 summer and autumn spawning periods.

Results showed that Canadian herring could be more correctly classified than Gulf of Maine and Georges Bank herring. Some differences in morphological variables were observed between the eastern and western Gulf of Maine herring. The models produced by this work could be used in future research to better determine the mixing rates of the three spawning stock components in non-spawning times. This information may be reviewed if stock structure, as a larger topic, is explored in future benchmark stock assessments for herring.

5.1.4 Trends in Abundance and Biomass of the Atlantic Herring Resource

5.1.4.1 NMFS Trawl Survey – All Strata

The mean number of Atlantic herring per tow and mean weight per tow from the NMFS spring and fall research surveys for the entire Atlantic herring complex have been derived from the NEFSC trawl survey, which samples the range of the Atlantic herring resource in the U.S. Exclusive Economic Zone (EEZ). Mean numbers per tow for 2009 and more recent years have been calibrated from R/V Bigelow catches to equivalent R/V Albatross catches using season and length specific calibration factors. Mean weights per tow were calibrated similarly except with a single calibration factor common to all seasons and lengths (Miller et al. 2009).

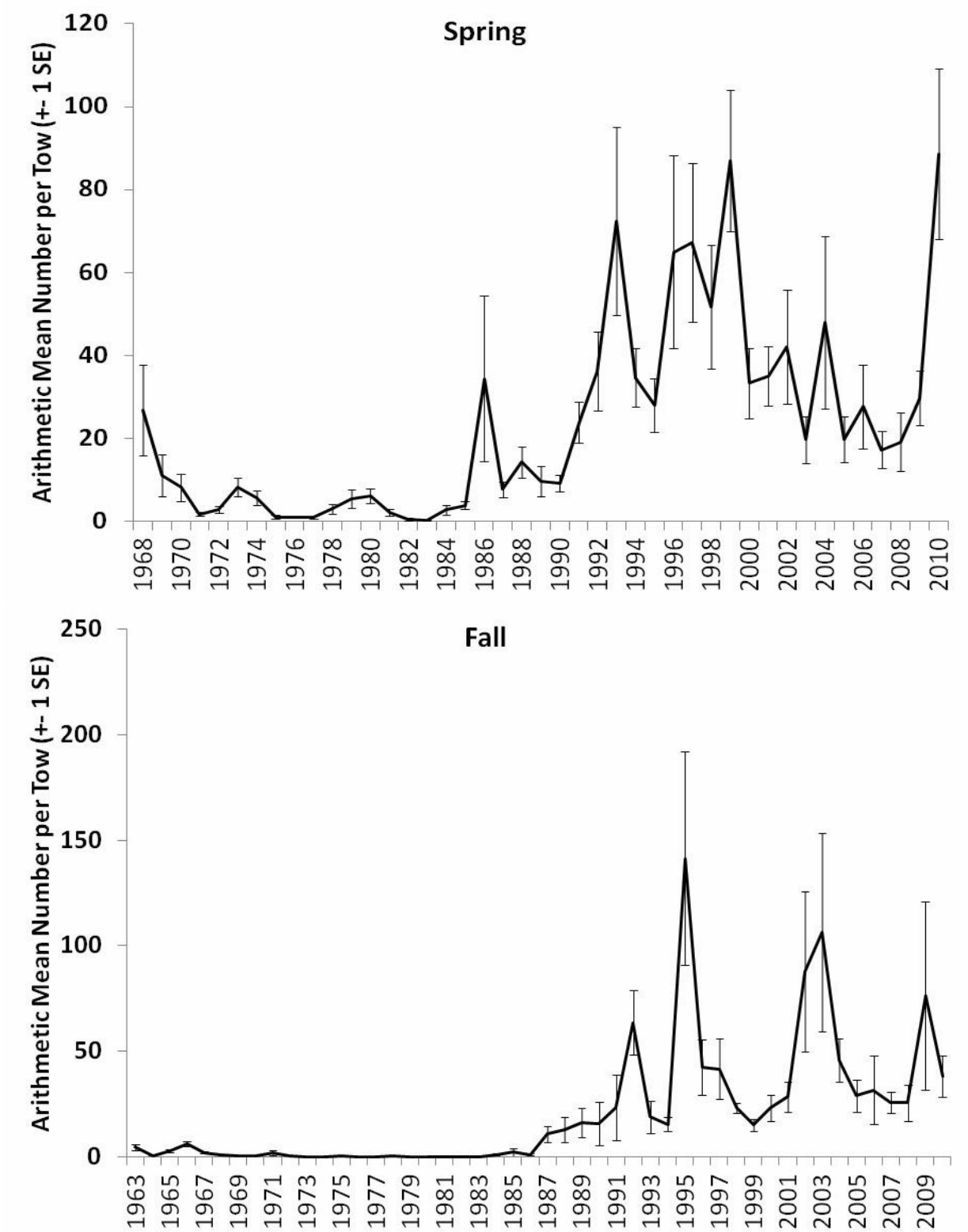
Table 8 summarizes data (mean weight per tow in kilograms and mean number per tow) from the NMFS spring and autumn bottom trawl surveys from 1990 – 2011. Figure 28 represents the survey data for mean number per tow graphically.

Table 8 NMFS Trawl Survey – Herring Catch Per Tow (Mean Number and Weight in kg), 1990-2011

YEAR	SPRING SURVEY		AUTUMN SURVEY	
	number/tow	kg/tow	number/tow	kg/tow
1990	15.85	1.77	23.70	3.03
1991	40.52	4.54	35.17	5.47
1992	36.33	2.80	56.60	9.25
1993	72.43	7.65	28.48	4.65
1994	58.83	6.90	13.71	2.15
1995	28.10	3.08	125.75	13.12
1996	64.92	3.89	37.65	4.64
1997	67.27	4.26	37.06	4.87
1998	51.69	4.91	20.63	2.84
1999	86.95	9.72	13.52	1.84
2000	33.34	2.92	20.65	3.18
2001	35.07	3.35	25.33	3.69
2002	42.09	2.69	77.99	10.74
2003	33.41	3.46	94.76	6.24
2004	48.00	2.22	40.70	5.04
2005	19.87	1.49	25.70	3.37
2006	27.72	2.89	28.16	3.47
2007	17.33	1.72	22.97	3.16
2008	19.18	2.02	22.83	3.07
2009	31.30	10.10	67.19	6.65
2010	89.29	8.46	34.42	3.13
2011	112.17	17.50	42.34	N/A

Source: NEFSC

Figure 28 Herring Mean Number Per Tow Indices from the NMFS Spring and Autumn Survey Through 2011



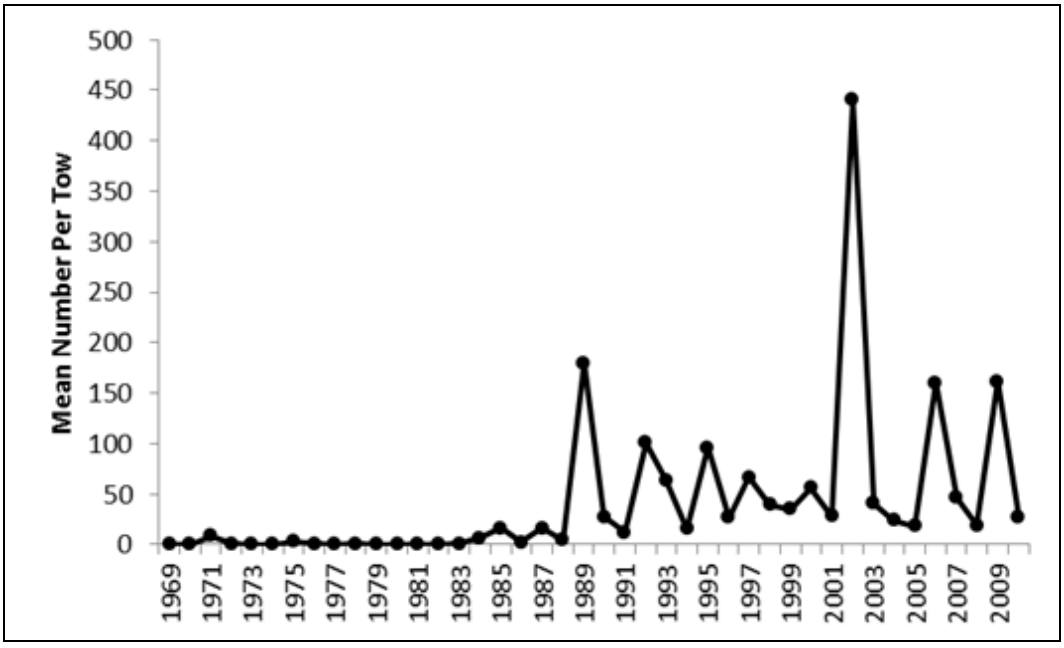
Source: SAW 54 Report (August 2012)

5.1.4.2 NMFS Trawl Survey – Inshore GOM Strata

To examine NMFS trawl survey trends in the inshore Gulf of Maine area separately, NMFS survey strata 26, 27, and 38-40 were isolated because they include the majority of the area from this survey that represents the inshore Gulf of Maine. Similar to the calibration used for the analysis of the entire herring complex (Section 5.1.4.1), mean numbers per tow for 2009 and more recent years have been calibrated from R/V Bigelow catches to equivalent R/V Albatross catches using season and length specific calibration factors. Mean weights per tow were calibrated similarly except with a single calibration factor common to all seasons and lengths (Miller et al. 2009).

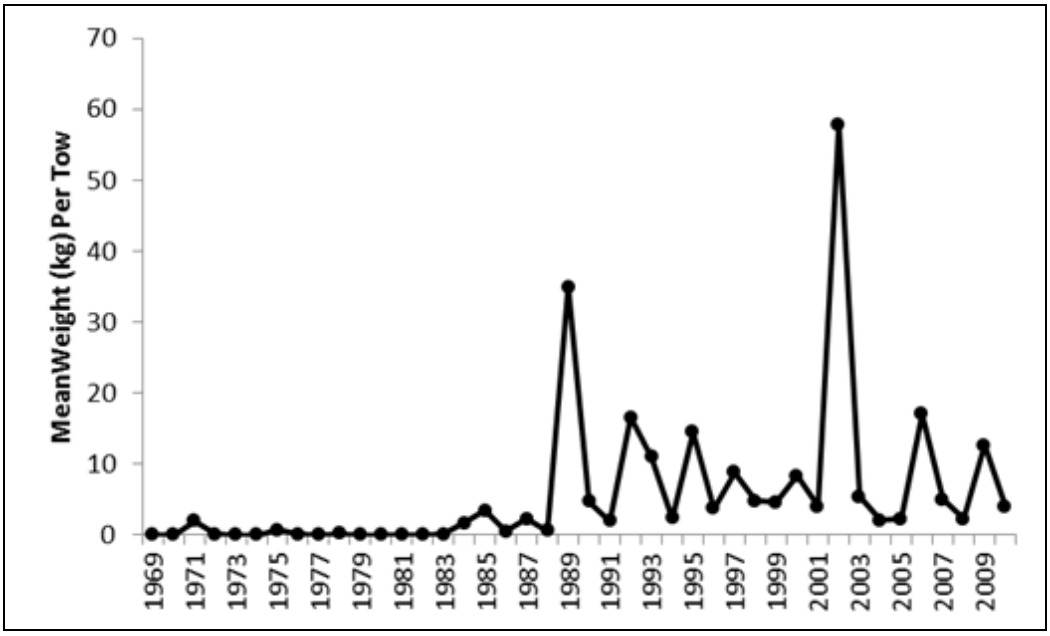
The NMFS fall survey and the spring survey were relatively flat, averaging very few fish per tow during the late 1960s through the early 1980s (Figure 29 – Figure 32). In the late 1980s, the spring indices increased significantly, and although variable, remained relatively high until 2005, when they dropped again. The spring indices increased again, however, from 2005 to present. Fall indices have remained highly variable since the 1980's, and the 2010 indices had a relatively low mean number per tow.

Figure 29 Herring Mean Number Per Tow Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1963-2010



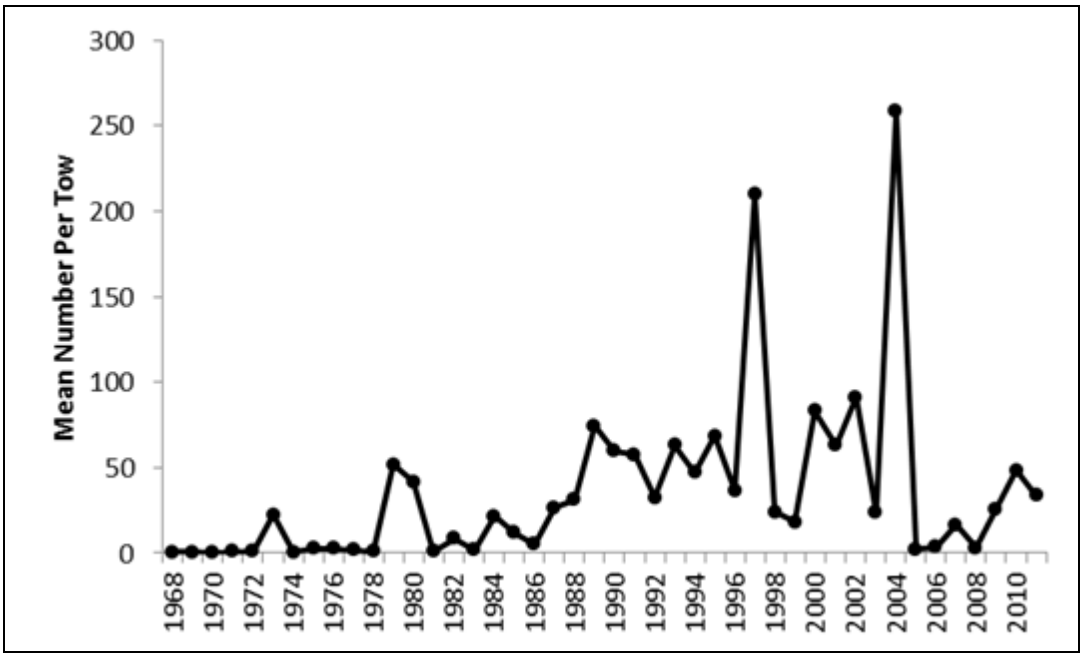
Source: NEFSC

Figure 30 Herring Mean Weight Per Tow (Kilograms) Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1963-2010



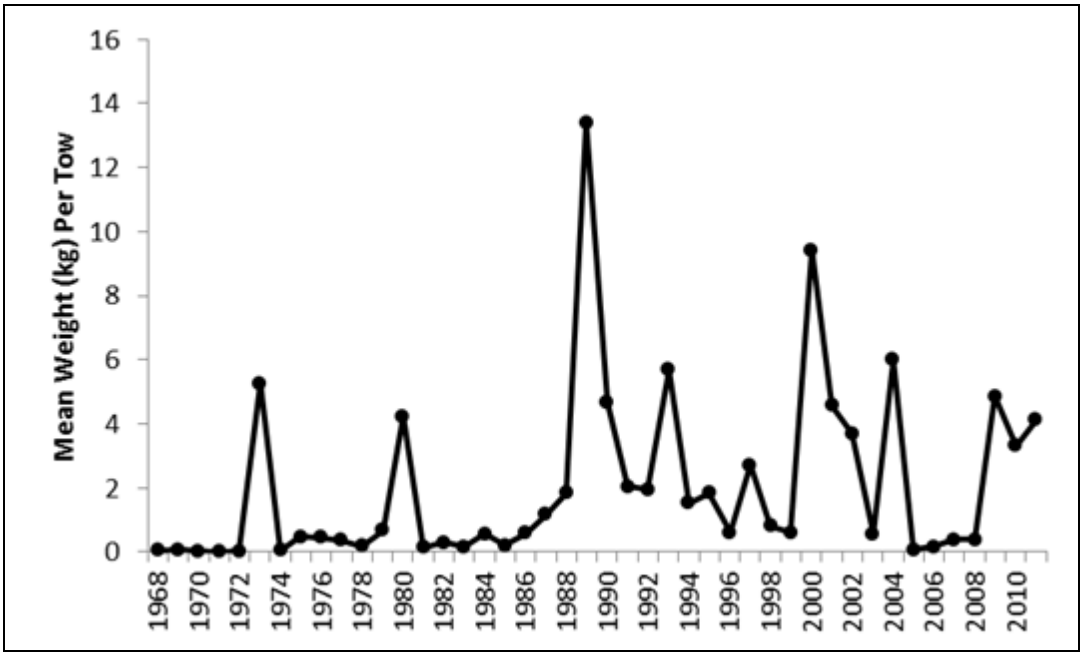
Source: NEFSC

Figure 31 Herring Mean Number Per Tow Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1968-2011



Source: NEFSC

Figure 32 Herring Mean Weight Per Tow (Kilograms) Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore GOM Area), 1968-2011



Source: NEFSC

5.1.4.3 MA DMF Inshore Trawl Survey

The Massachusetts Division of Marine Fisheries (MA DMF) research bottom trawl surveys (Strata 25-36) for spring and fall through 2010 were examined for trends in the inshore herring component. In general, the MA DMF inshore survey is dominated by young herring and does not track adult herring abundance. Thus, survey data are more useful as recruitment indices for this resource.

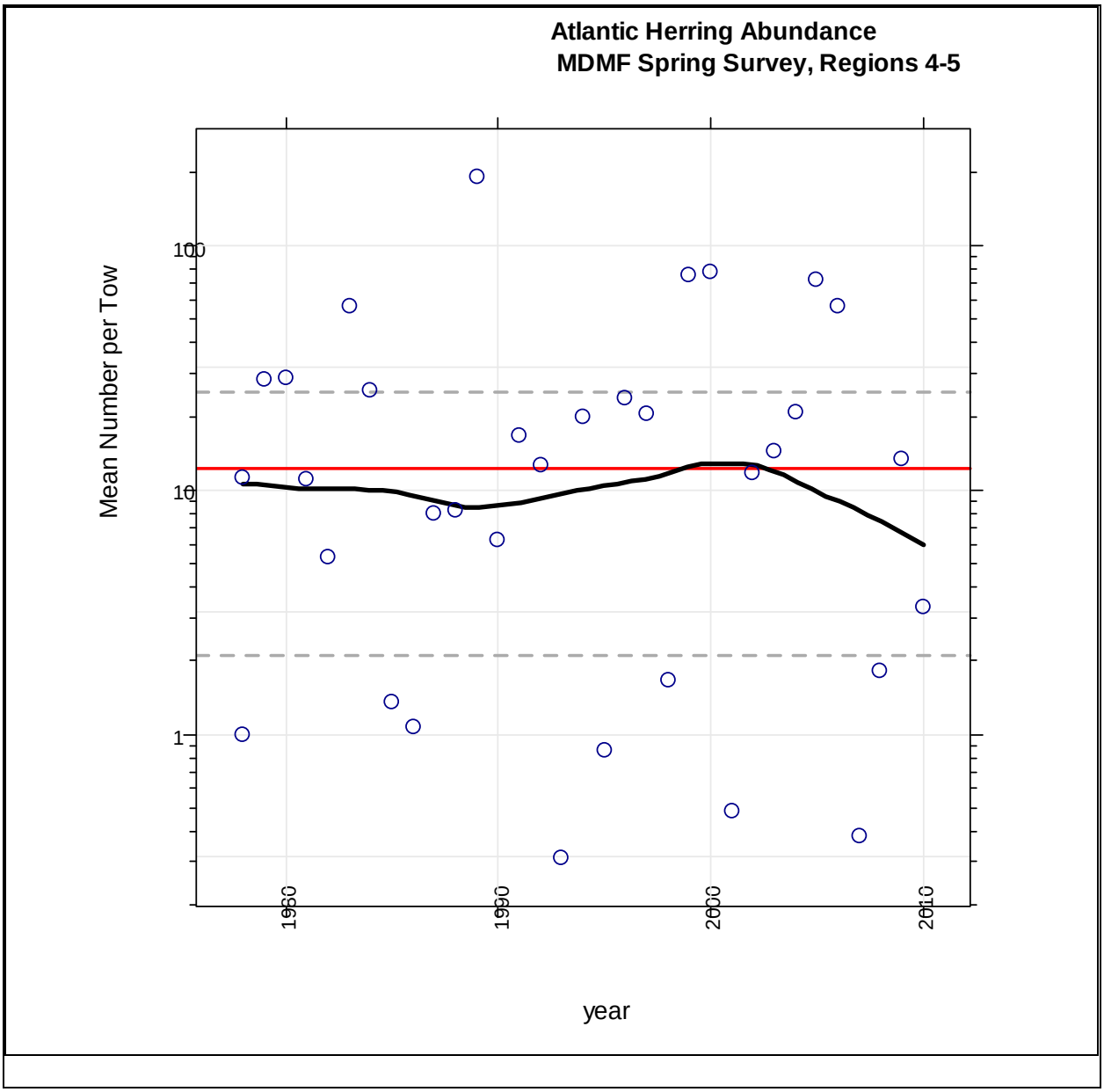
The fall and spring survey time series are highly variable, as may be expected for a pelagic species, and both indices are dominated by young herring (Figure 33 and Figure 34). The spring survey fluctuates without trend, although 2007 and 2008 were well below the 25th quantile (Figure 33). Note that the large increase in the fall 2003 index was heavily influenced by two very large tows in Region 4 (Cape Cod Bay). The relative abundance index was low in 2007 and 2008, with both years below the 25th quantile of the time series. The index ticked up to approximately the median in 2009.

The encounter rate for herring in the MA DMF inshore bottom trawl survey, as measured by the ratio of tows with herring to total tows, is shown in Figure 35. Both the spring and fall time series are highly variable and have fluctuated without trend for most of the time series. However, because herring is a schooling pelagic fish, the encounter rate index may be tracking the number of schools rather than abundance.

Both the relative abundance indices and the encounter rate indices are highly variable, making interpretation difficult. Perhaps the best use for these indices would be to watch for short runs that occur on either side of the inter-quartile range. Runs below the 25th quantile may indicate a trend of poor recruitment.

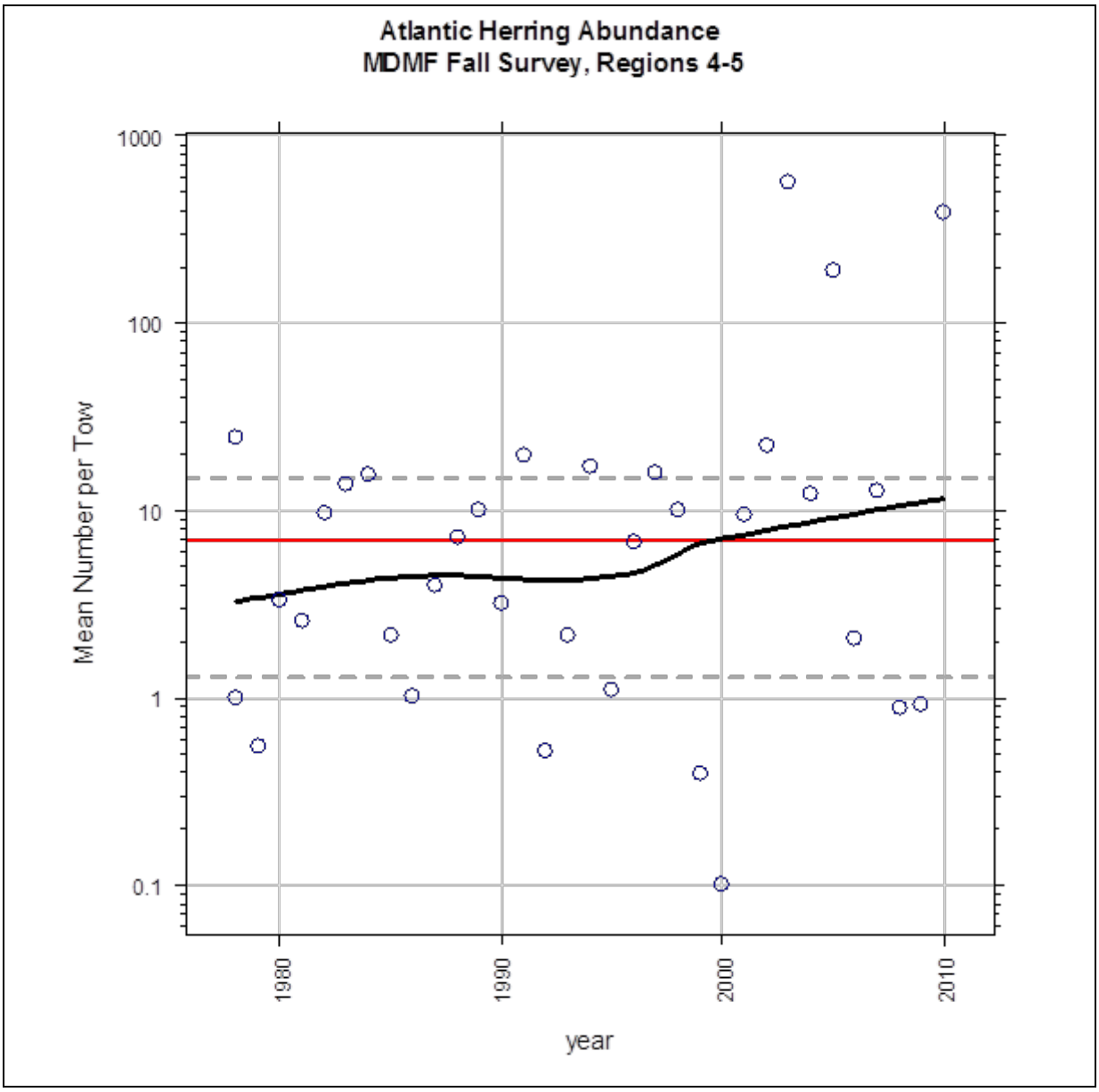
The time series of length frequency distributions for spring and fall surveys are shown in Figure 36 – Figure 39. These figures indicate high year to year variation in mean number per tow and demonstrate that the MA DMF indices are dominated by juveniles.

Figure 33 MA DMF Spring Survey Stratified Mean Number per Tow for Strata 25-36



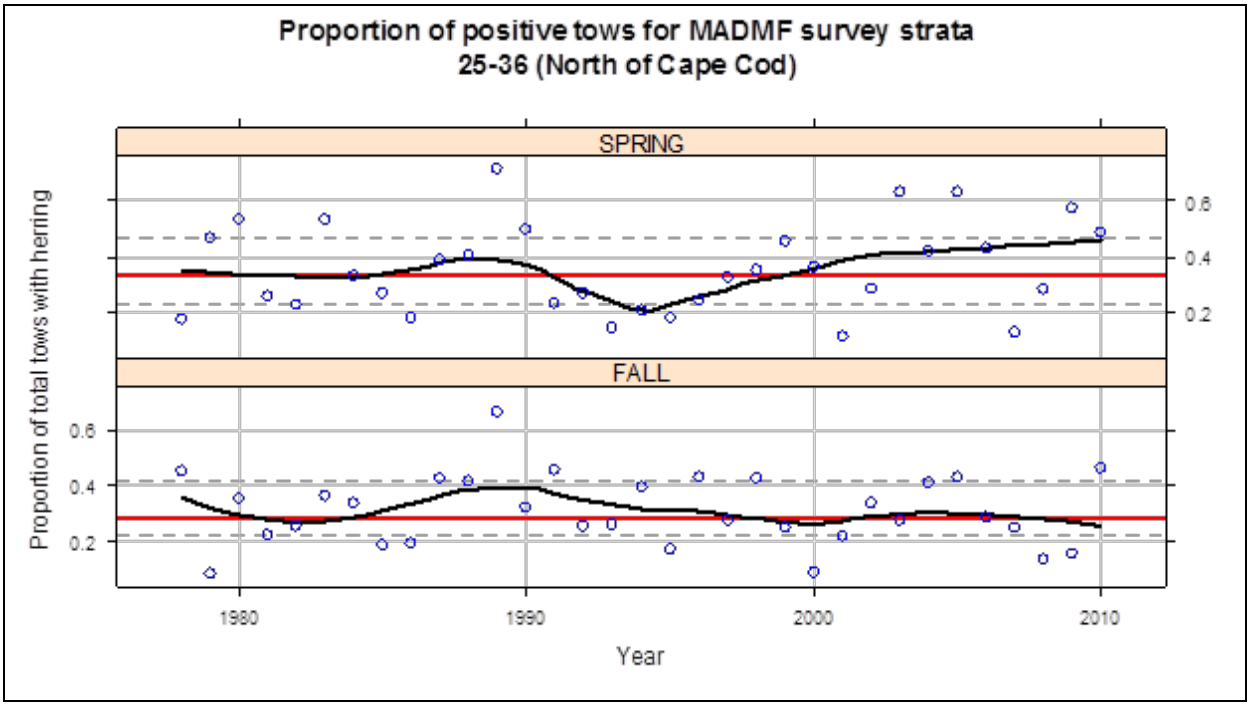
Source: MA DMF
The y-axis scale is logarithmic.
Solid black line is LOESS fit with span=0.6.
Solid red line is time series median and dashed lines delimit inter-quartile range.

Figure 34 MA DMF Fall Survey Stratified Mean Number per Tow for Strata 25-36



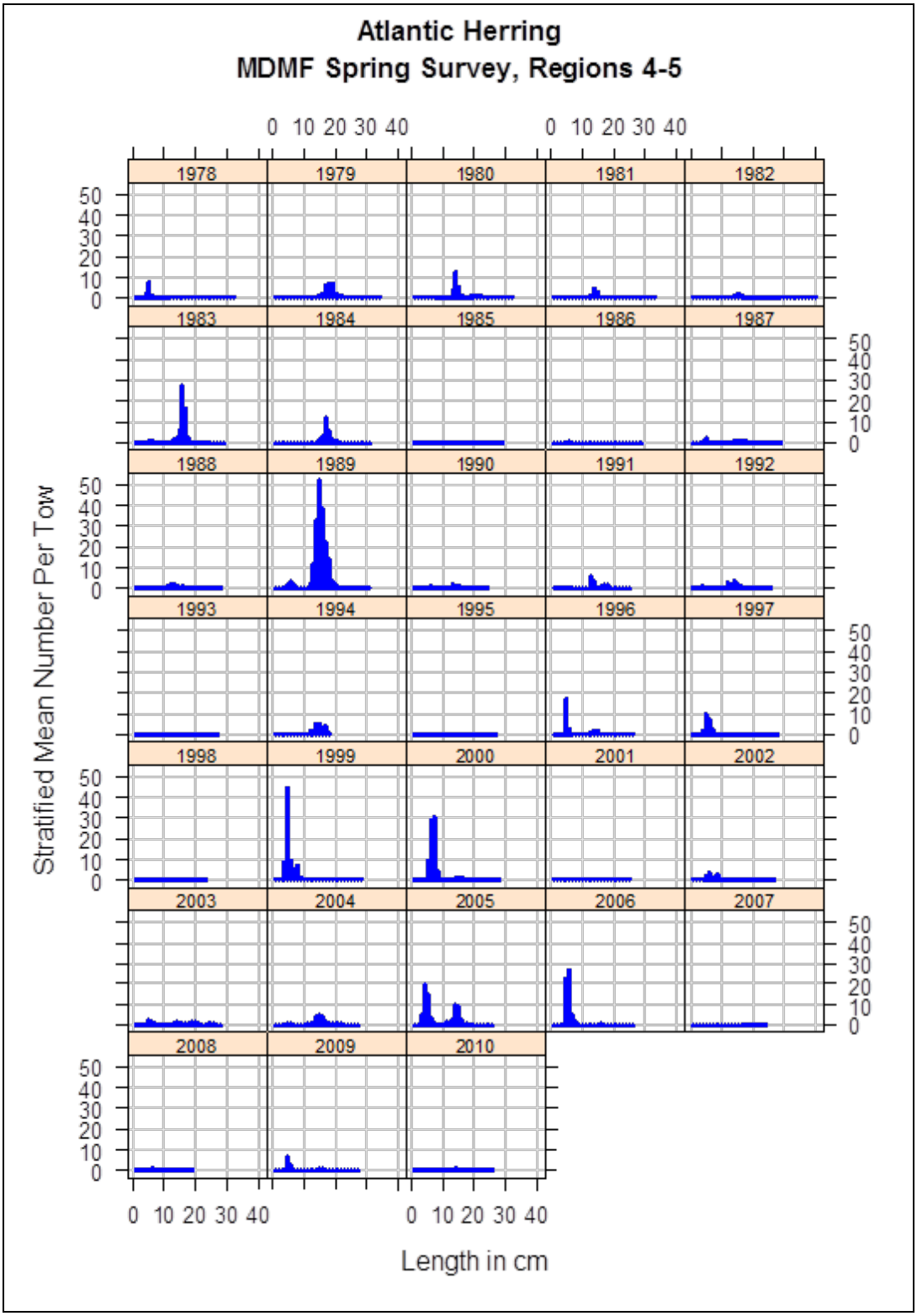
Source: MA DMF
Solid black line is LOESS fit with span=0.6.
Solid red line is time series median and dashed lines delimit inter-quartile range.

Figure 35 Number of MA DMF Spring (1978-2010) and Fall (1978-2010) Survey Tows That Encountered Herring as a Proportion of Total Tows for Strata 25-36



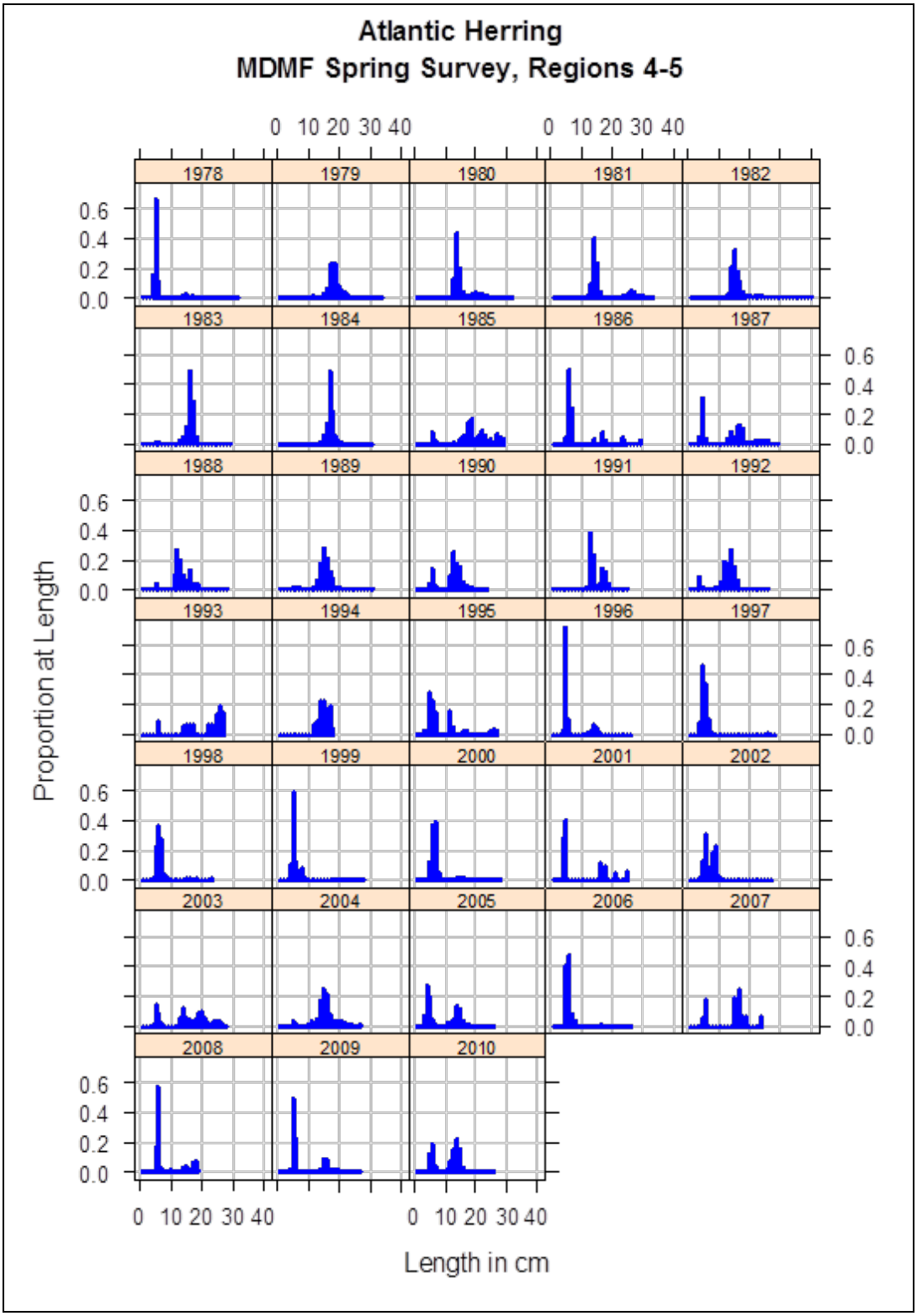
Source: MA DMF
Solid red line is LOESS fit with span=0.3 and degree=1.
Solid black line is time series median.
Dashed gray lines indicate 25th and 75th quantiles of the time series.

Figure 36 Stratified Mean Number per Tow at Length for MA DMF Spring Survey, 1978-2010



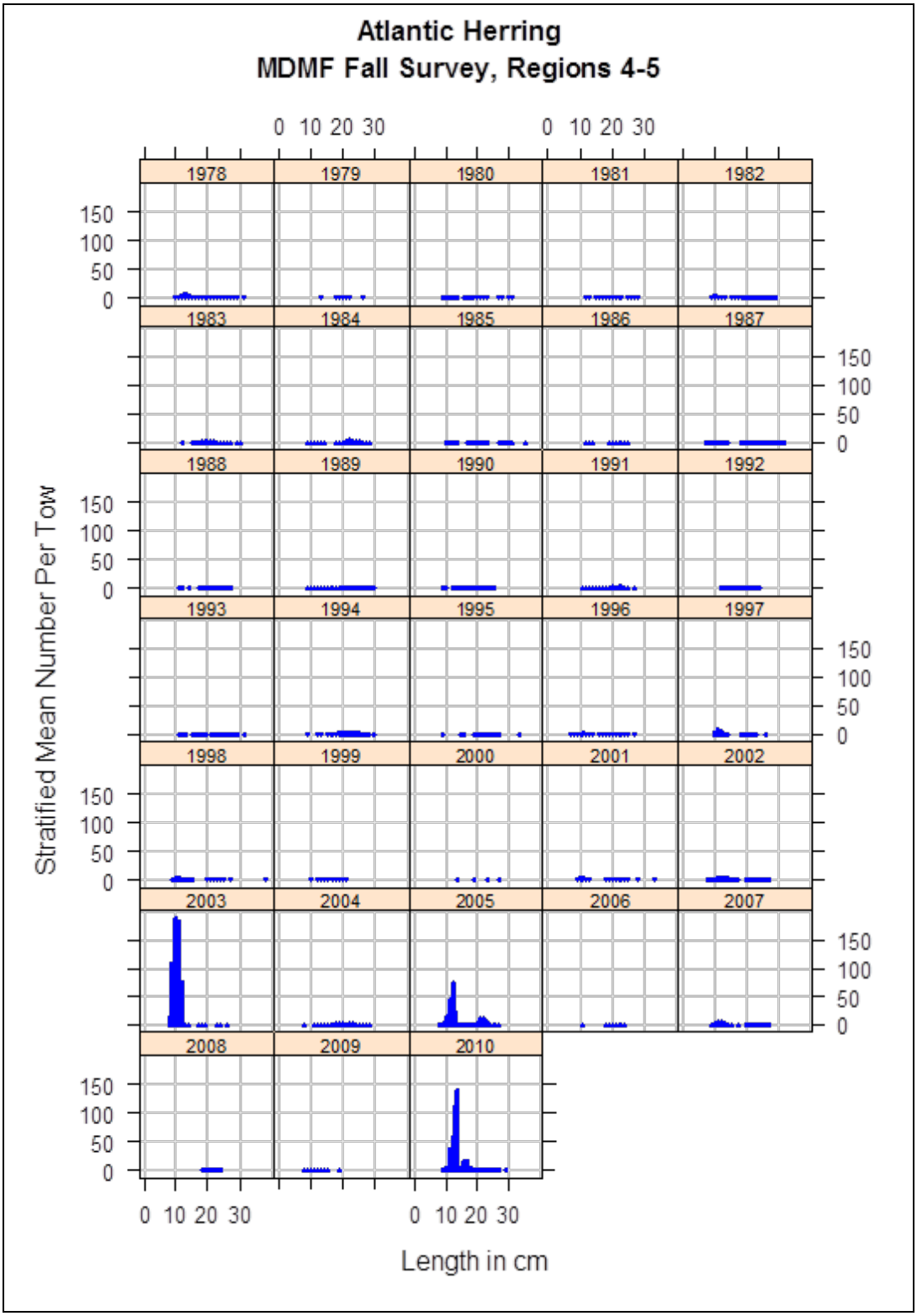
Source: MA DMF

Figure 37 Proportion of Mean Number per Tow at Length for MA DMF Spring Survey, 1978-2010



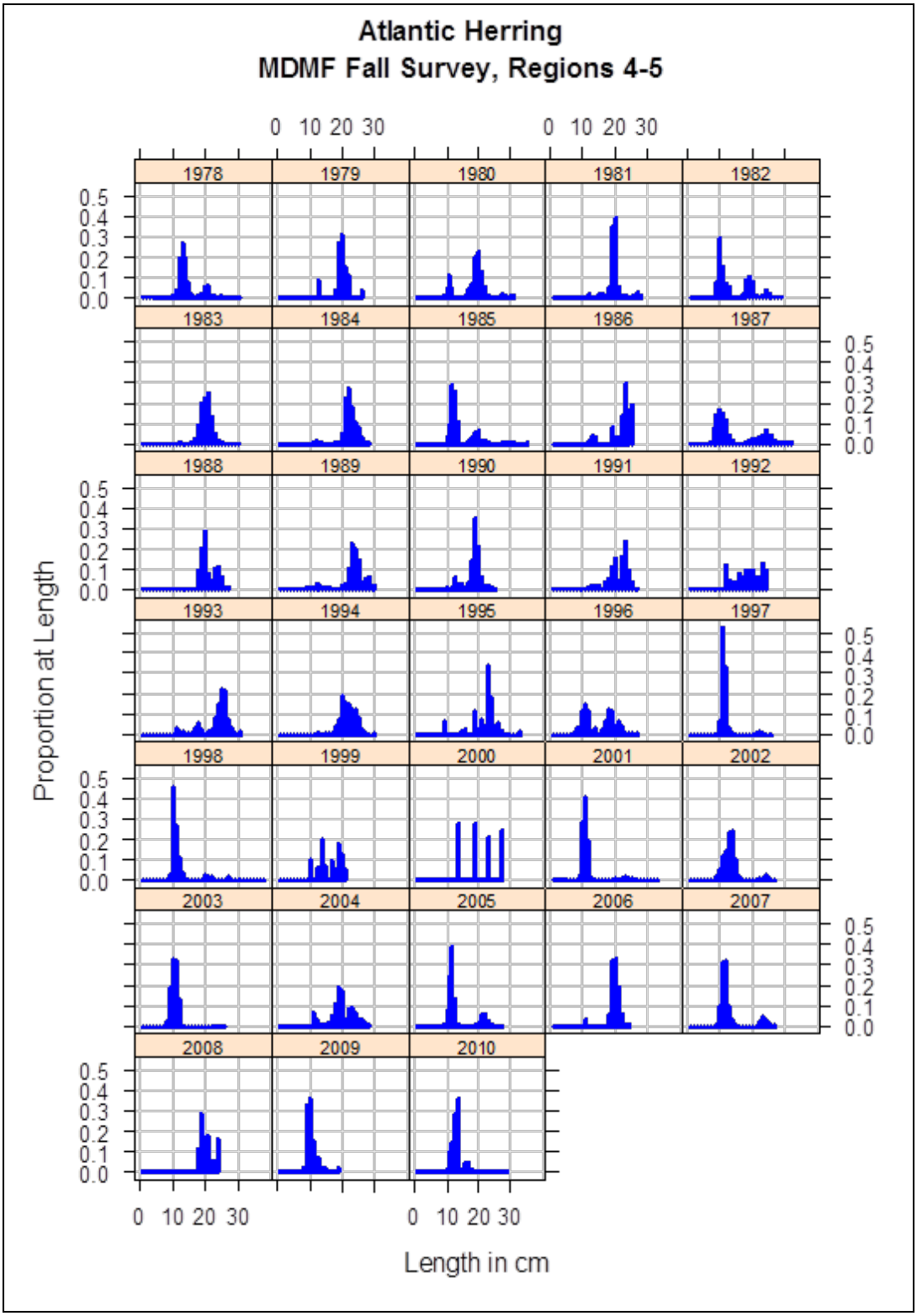
Source: MA DMF

Figure 38 Stratified Mean Number per Tow at Length for MA DMF Fall Survey, 1978-2010



Source: MA DMF

Figure 39 Proportion of Mean Number per Tow at Length for MA DMF Fall Survey, 1978-2010



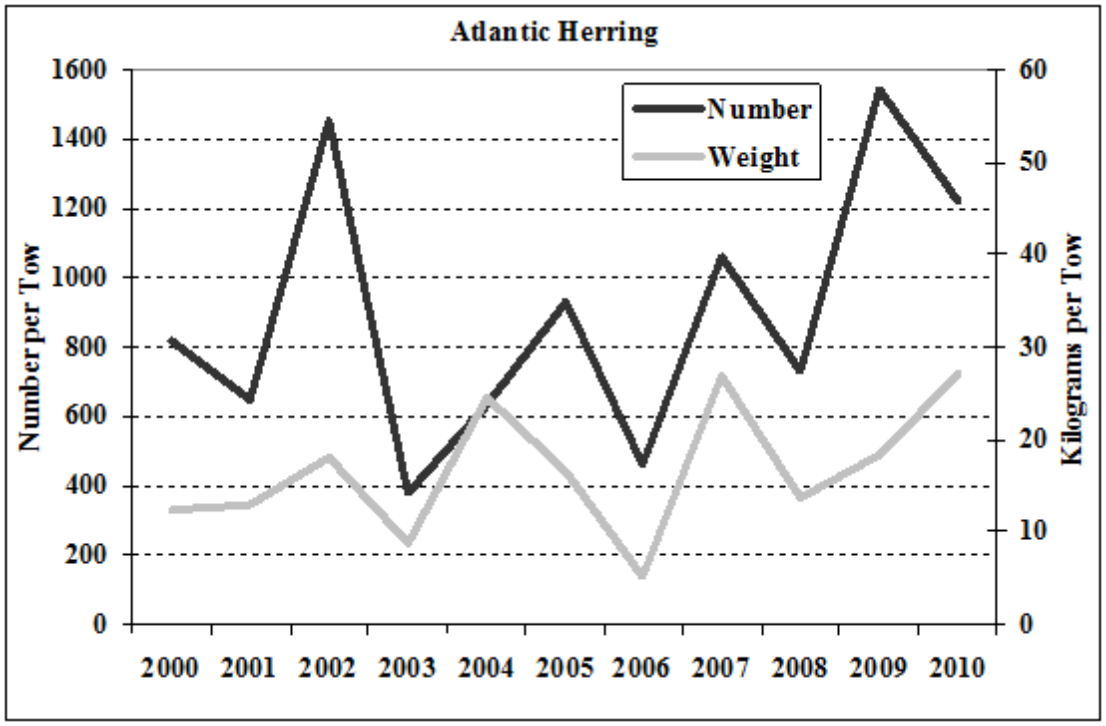
Source: MA DMF

5.1.4.4 ME DMR Inshore Trawl Survey

Since Fall 2000, Maine Department of Marine Resources (Maine DMR), in conjunction with the Gulf of Maine Research Institute and the State of New Hampshire, have been conducting an inshore bottom trawl survey. While this survey targets principal groundfish species from the NH/MA boarder to Canada, it regularly samples herring in many of its strata. Results from the fall and spring survey (Figure 40 and Figure 41) have been variable over the time series, and no trend is apparent.

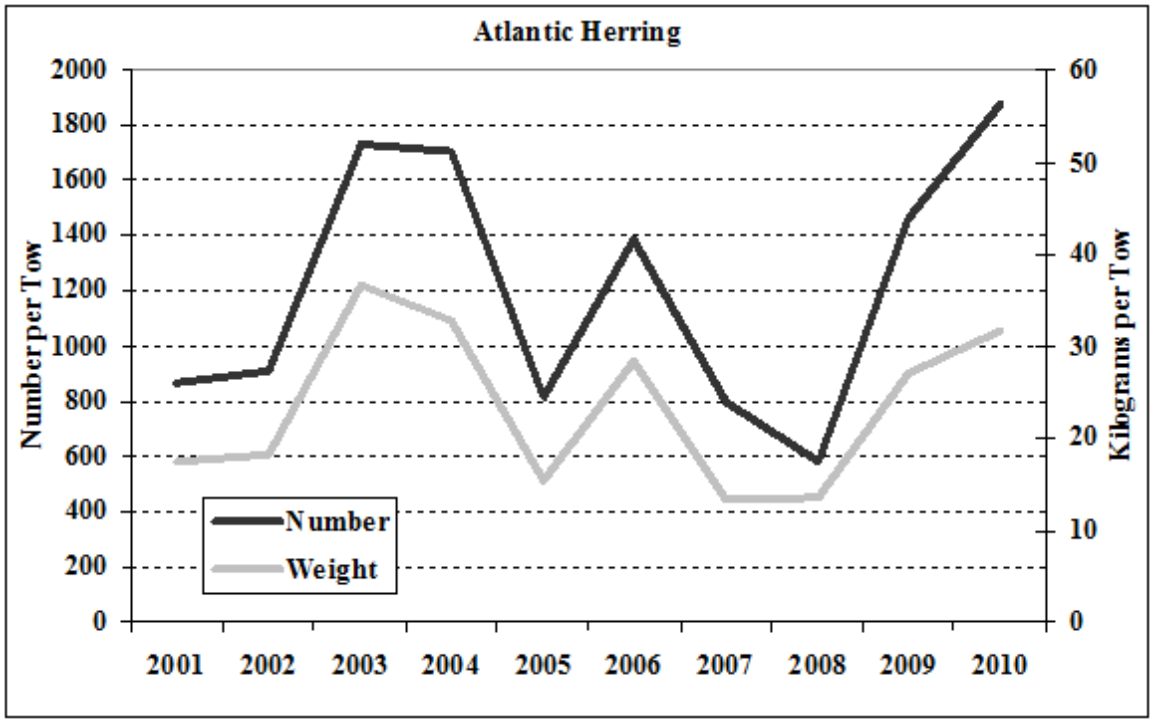
This is a ME/NH coast-wide bottom trawl survey, the results of which should not be viewed as an index of spawning stock biomass (SSB) for the inshore component of the herring resource. In fact, most of the fish sampled by this survey are age 1 fish. The ME DMR data for age 1 are not used in the herring stock assessment. The length frequencies (Figure 42 and Figure 43) can be viewed as a recruitment index and is used to calibrate the NMFS trawl survey data for the TRAC. Similar to the MA DMF survey, this bottom trawl survey may provide an indication of pre-recruitment year class strength.

Figure 40 ME DMR Fall Inshore Bottom Trawl Survey Catch (# Fish) Per Tow



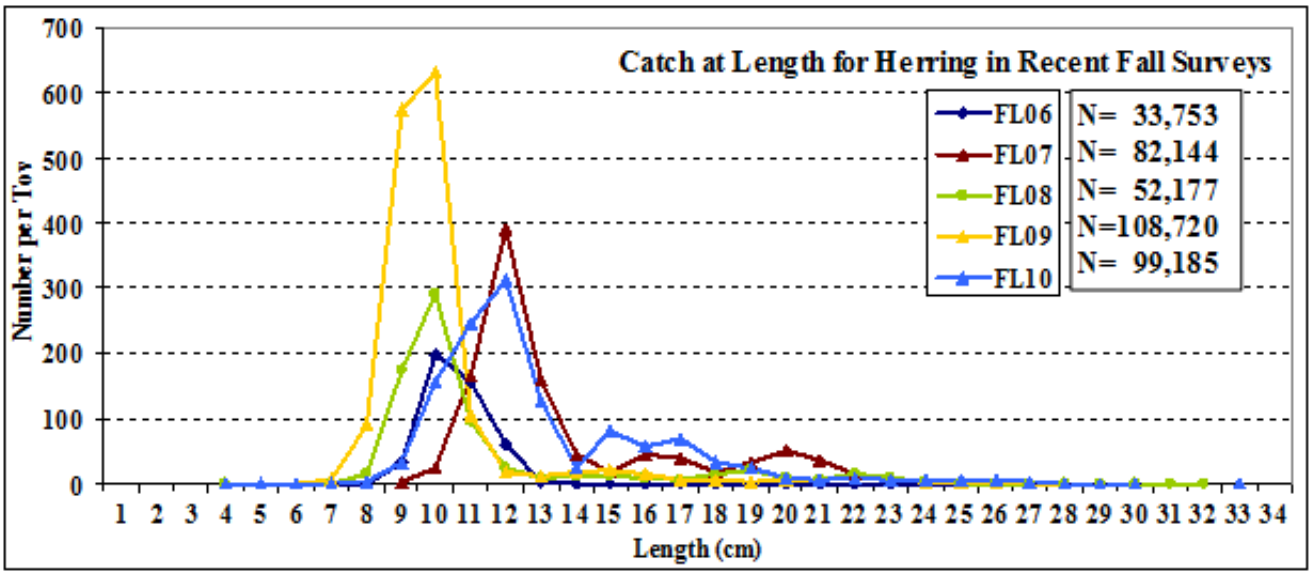
Source: ME DMR

Figure 41 ME DMR Spring Inshore Bottom Trawl Survey Catch (# Fish) Per Tow



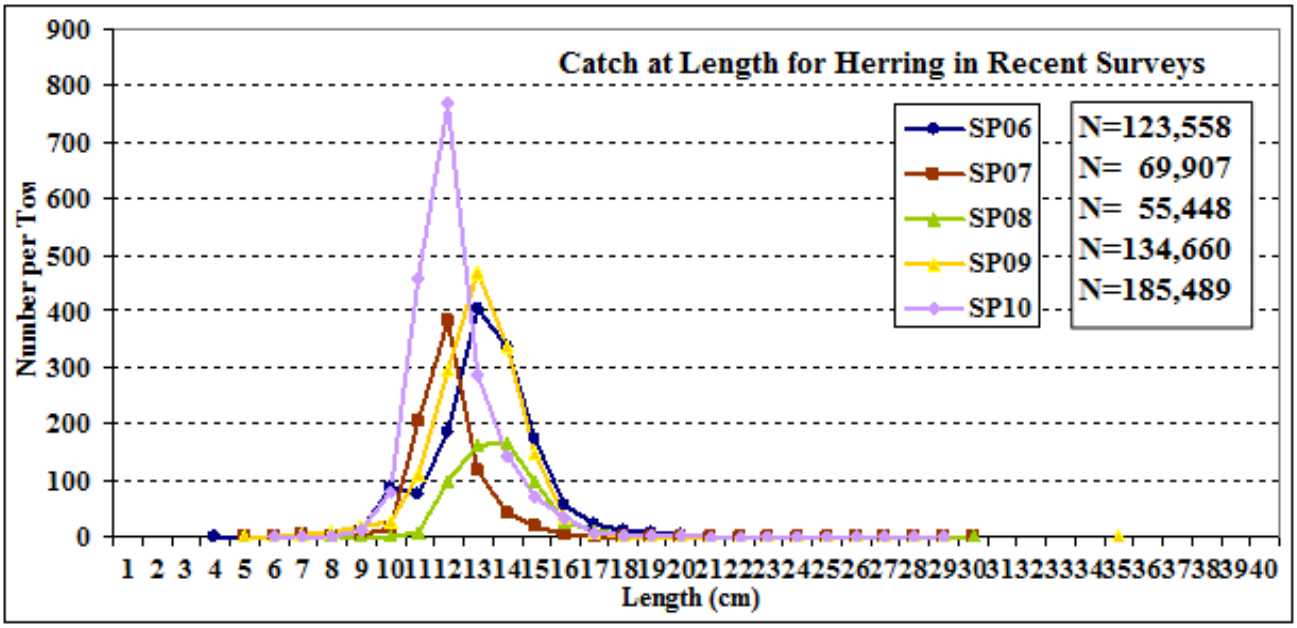
Source: ME DMR

Figure 42 Length Frequencies for Herring Sampled by the ME DMR Fall Inshore Bottom Trawl Survey



Source: ME DMR

Figure 43 Length Frequencies for Herring Sampled by the ME DMR Spring Inshore Bottom Trawl Survey



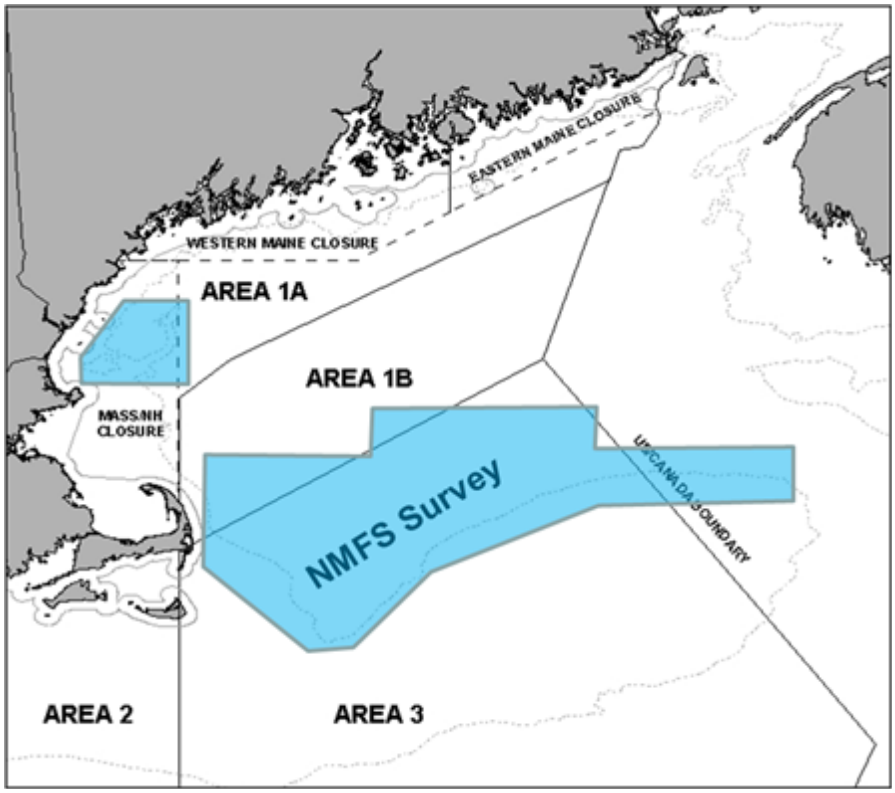
Source: ME DMR

5.1.4.5 Acoustic Surveys

Brief History

The NMFS NEFSC acoustic survey of the offshore component of the Atlantic herring population began in earnest in 1999 after about four years of initial pilot work. The survey covers the northern edge of George's Bank and Great South Channel from the 'northeast peak' to Cape Cod and was designed to sample aggregations of herring as they prepared to spawn in the fall (Figure 44). Initially the index of abundance was near historical highs, but beginning in 2002, the index of abundance from the acoustic survey declined approximately four-fold and remained relatively low through 2008, although increasing in recent years (Figure 45). This decline and low-level index, however, may not have reflected the true changes in abundance. The fundamental assumption of the acoustic survey is that the herring are congregating to spawn in and during the survey area and period. Atlantic herring spawning times and locations may have changed, but the survey area and timing remained relatively stable among years. If this is the case, the acoustic survey may not be achieving adequate spatial and temporal coverage. For this reason, the acoustic survey was not used in fitting recent Atlantic herring stock assessments (Shepherd et al., 2009). A more detailed evaluation of the acoustic survey was performed during SAW 54 (2012) and can be found in the full assessment report (NEFSC, August 2012).

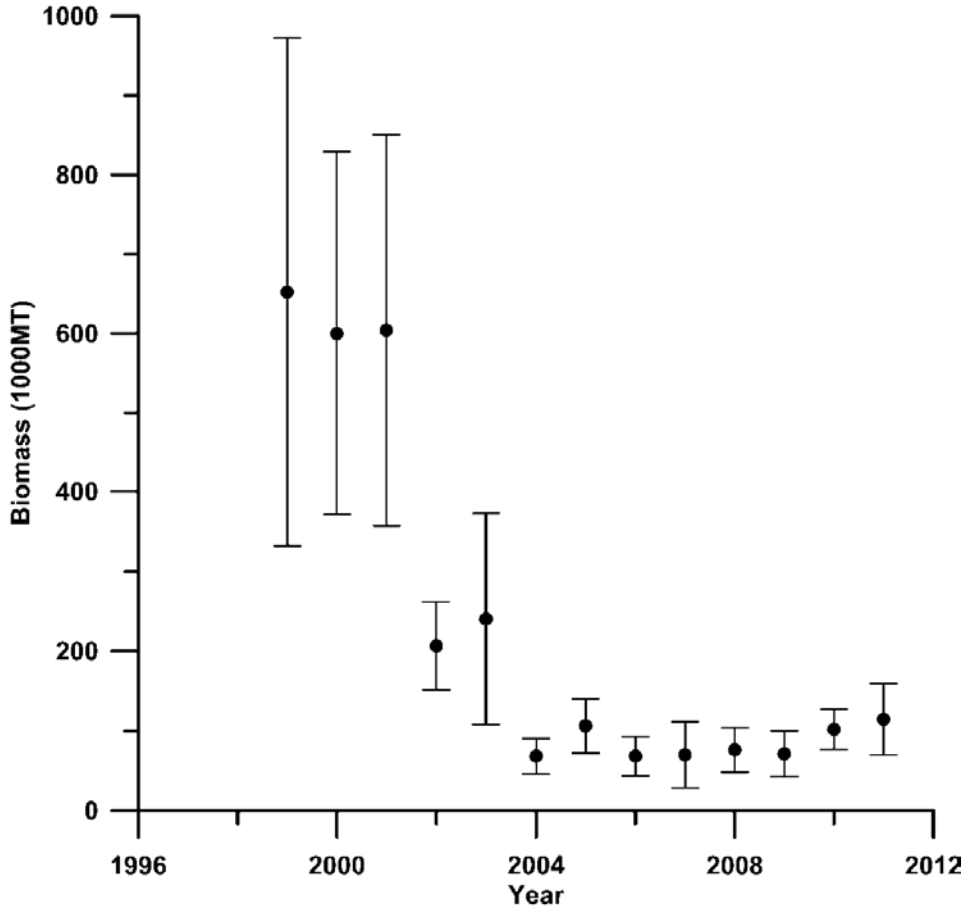
Figure 44 Survey Areas of the Atlantic Herring Acoustic Survey



Source: NEFSC

Surveys on Georges Bank and Jeffreys Ledge have been completed every year since 1999

Figure 45 Atlantic Herring Acoustic Index of Abundance on Georges Bank (Biomass Estimates with Standard Error), 1999-2011



Source: SAW 54 (August 2012)

The NMFS acoustic index was excluded from the base model in the most recent benchmark assessment for Atlantic herring (SAW 54) because it covers a variable proportion of the stock complex and so may not be a valid annual index of the entire complex. Furthermore, the sharp decline in the acoustic index between 2001 and 2002 remained unexplained. The trends from the acoustic survey also did not agree with information from bottom-trawl surveys or fishery monitoring data. This disagreement led to issues of fit when a sensitivity analysis was completed that included the acoustic survey. Research is ongoing to resolve these issues and continue to improve the survey.

5.1.4.6 2009 TRAC Stock Assessment

Since 1998, the Transboundary Resources Assessment Committee (TRAC) has reviewed stock assessments and projections necessary to support management activities for shared resources across the USA Canada boundary in the Gulf of Maine-Georges Bank region. These assessments are necessary to advise decision makers on the status of these resources and likely consequences of policy choices. The most recent TRAC update assessment of the Atlantic herring complex occurred in June 2009 in St. Andrew's New Brunswick. Atlantic herring were last assessed in a benchmark assessment in May 2006 (O'Boyle and Overholtz 2006). At the 2006 assessment meeting, it was agreed that the Age Structured Assessment Program (ASAP) base model showed the least retrospective pattern and was the preferred approach amongst all the model formulations. The purpose of the 2009 update assessment meeting was to update both independent and dependent data, and use it in the established benchmark formulation to determine the current status of the Atlantic herring resource. A summary of the results of the 2009 TRAC can be found in Amendment 4.

Overfishing Definition – Stock Status

In the 2009 TRAC assessment, the stock complex was not overfished and overfishing was not occurring. MSY reference points for the herring complex were re-estimated during the most recent assessment (TRAC 2009). Results from a Fox surplus production model were FMSY = 0.27 and B_{MSY} = 670,600 mt. The Gulf of Maine-Georges Bank herring complex began to recover during the late 1980s and current total biomass (age 2+) is now comparable to the mid-1970s, just before the collapse. Biomass increased from a low of about 112,000 mt in 1982 to about 854,000 mt in 2000, and declined slightly to about 652,000 mt in 2008, which was just below B_{MSY} (670,600 mt). Fishing mortality has remained relatively low since the early 1990s and averaged 0.17 during 1998-2008, which is below F_{MSY} (0.27).

5.1.4.7 2012 SAW/SARC 54 Benchmark Assessment – Summary of Stock Status

The recent 54th Stock Assessment Workshop (SAW) and Stock Assessment Review Committee (SARC) reviewed a benchmark assessment for the Atlantic herring stock complex in which a new ASAP assessment model was accepted. The new model features a 50% increase in natural mortality rate (M) during 1996-2011 and is consistent with data on consumption of herring by predator; it largely resolves the retrospective pattern which has been a prominent and severe feature of previous years.

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) (Table 8). The BRPs were affected by the 50% increase in natural mortality beginning in 1996, and so are considered uncertain (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 9 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), and (2) the methods used to estimate the BRPs; where the Fox model was used in TRAC 2009 and the Beverton-Holt (BH) stock-recruitment curve estimated within ASAP was used for SAW/SARC 54.

Table 9 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

There are three sources of uncertainty that were expressed during the 54th SAW/SARC: (1) Biological Reference Points (BRPs), (2) the size of the 2008 herring year class (largest in history), and (3) the natural mortality rate (M). Overall, the SARC concluded that the Atlantic herring stock is not overfished and that overfishing is not occurring. The overfishing definition for herring along with the status of the herring stock in respect to the 54th SAW/SARC 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 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).

5.1.4.8 Commercial Catch Sampling

Samples of Atlantic herring collected from the commercial catch are processed at the Maine Department of Marine Resources (ME DMR). Historically, samples were obtained from sardine canning plants, some of which transported fish from other states. NMFS port agents, fishery biologists in other states, and the Canadian Department of Fisheries and Oceans would also provide samples or data to the State of Maine. Recently, ME DMR has been given a grant from the Atlantic Coastal Cooperative Statistic Program (ACCSP) for a dedicated herring sampler. Normally, 4-8 samples are collected each month by statistical area harvested. However, more extensive sampling has occurred during foreign fishing or processing operations. Current sampling ratio is approximately one 50-fish sample per 500 mt.

Usually, between 175 and 250 samples are processed by ME DMR each year. Samples of 50 fish are processed for length (mm total length), weight (grams), sex, and, where applicable, sexual maturity and gonad stage, using standard procedures and criteria. From each sample, the sagittal otoliths are removed from two fish per centimeter group and embedded in plastic blocks for ageing. Periodic calibration of ageing procedure is conducted with NMFS' scientists. Data from commercial catch samples have been updated through the 2010 fishing year and are presented below.

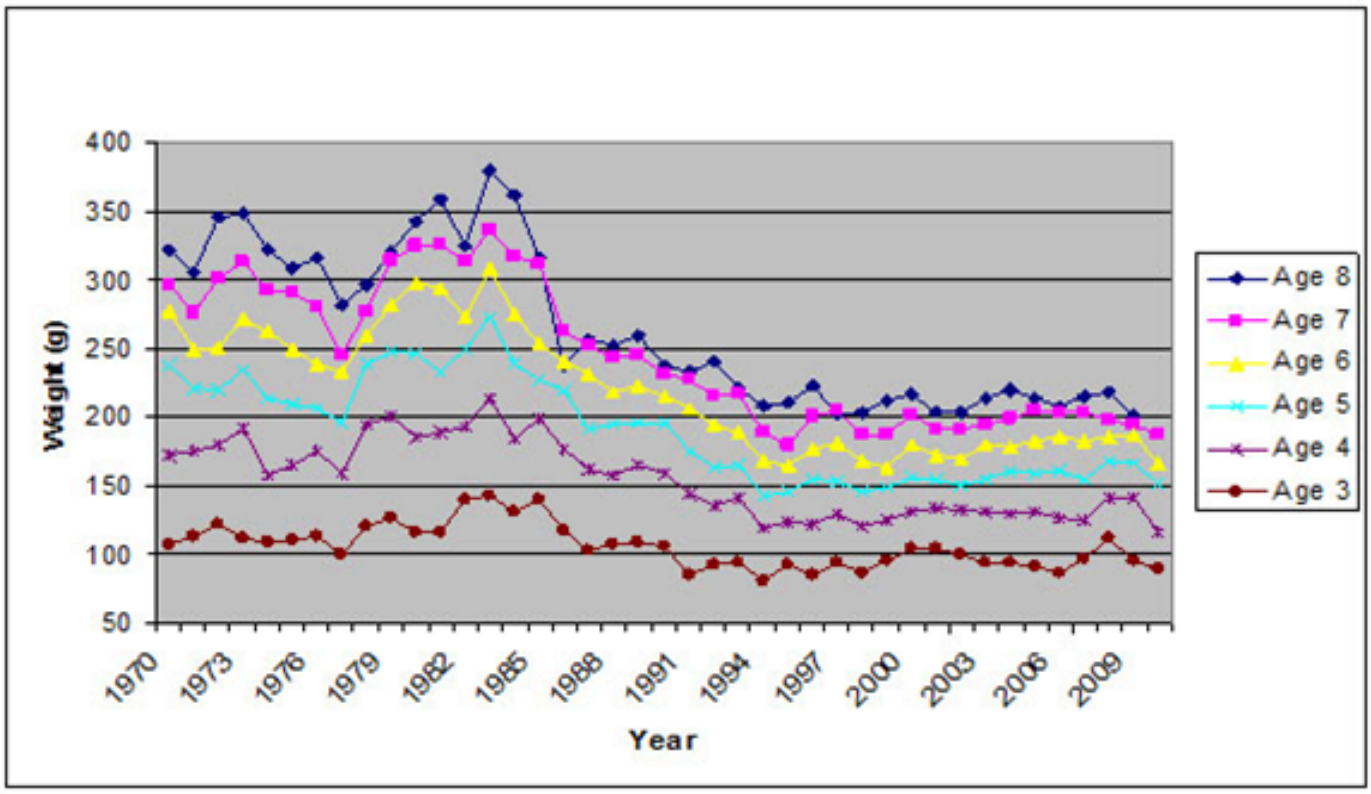
These data were updated through 2011 and reviewed as part of the SAW 54 benchmark assessment for the Atlantic herring stock complex (June/July 2012). Any new information will be considered by the Council during the Atlantic herring fishery specifications process.

Atlantic Herring Stock Complex

Resulting data for the Atlantic herring stock complex as a whole suggest a large reduction in weight at age since the late 1970s and early 1980s following the Georges Bank stock collapse from heavy foreign fishing (Figure 46). The reduction in both weight at age and length at age over time may have implications for the partial recruitment vector for this complex. While it is quite possible that density dependent factors may be involved (i.e., slower growth at higher stock sizes), other environmental factors also could attribute to the decline in weight at age (temperature fluctuations, food availability, for example). The reason for this reduction in weight at age in unknown. Consequently, these data should not be interpreted as a result of a reduction in available food, nor should the conclusion be reached that the complex is in danger of overpopulation. However, significant declines in weight at age over time are often attributed to density-dependent factors.

While the reduction in weight at age shown in Figure 46 is substantial, overall, weight at age for the stock complex is similar to, but slightly lower now than when the herring stock complex was considered to be at very high abundance during the 1960-1970 time period (not shown below). The recent trend in weight at age (1990-present) has been relatively flat with a slight decrease. However the most recent 3-year trend suggests fairly rapid declines for ages 4 to 6.

Figure 46 Total Weight at Age for the Atlantic Herring Stock Complex Through 2010



Source: ME DMR

Inshore Spawning Component

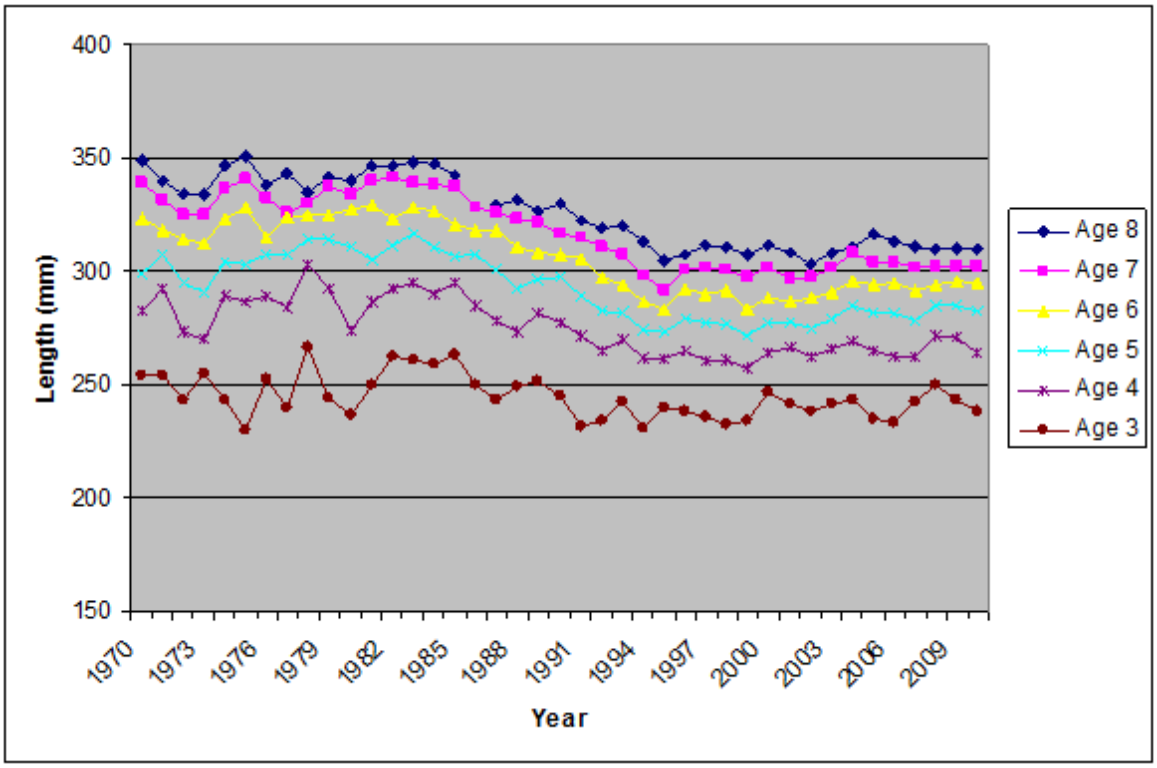
Samples from the inshore spawning stock (adult sized fish, GSI > 0.10) are available through 2010 (Figure 47). Since the mid-1980s, a rather large drop in size (total length at age) is apparent, though recent years have experienced a more stable trend in lengths at age. This is consistent with trends observed for the overall stock complex (see above). The biggest change in length at age for the inshore component occurred from 1984 – 1994, and since that time, the trend has been rather flat. Similar to samples from the stock complex as a whole (above), there may be a slight trend downward in recent years, but the differences between recent years are likely within the range of variability given the smaller sample sizes.

These data were updated through 2011 and reviewed as part of the SAW 54 benchmark assessment for the Atlantic herring stock complex (June/July 2012). Any new information will be considered by the Council during the Atlantic herring fishery specifications process.

A decline in growth over time may indicate that density-dependent factors are at work for the inshore component. As such, it also suggests that a larger stock exists than was apparent during the mid-late 1980s. It should be noted that slower growth for individuals from the inshore component might be the result of increased stock size for the complex overall, or a change in environmental conditions affecting feed and/or growth of the different year classes. However, the declines over time that have been observed, especially from 1984-1994, are not necessarily consistent with changes in environmental conditions. In this case, the downward trend in length at age may be more suggestive of density-dependent factors at work, especially because the trend is also consistent with the overall upward trend in

abundance apparent from the survey data. Similar to the overall complex, the inshore component is experiencing reduced growth, however the magnitude is much less then that seen in the overall complex.

Figure 47 Total Length at Age for Inshore Spawners (>230 mm and > GSI 0.10) Through 2010



Source: ME DMR

5.1.4.9 Time Series Analysis and Historical Data

Information regarding long-term fishery patterns and potential relationships between the fishery and outside variables and events, such as temperature, was provided in a thesis in 2003 (Klein, 2003). Both quantitative and qualitative data and information for the Atlantic herring fishery were investigated. The thesis provided means by which qualitative data could be incorporated into statistical methods by utilizing Time Series Analysis.

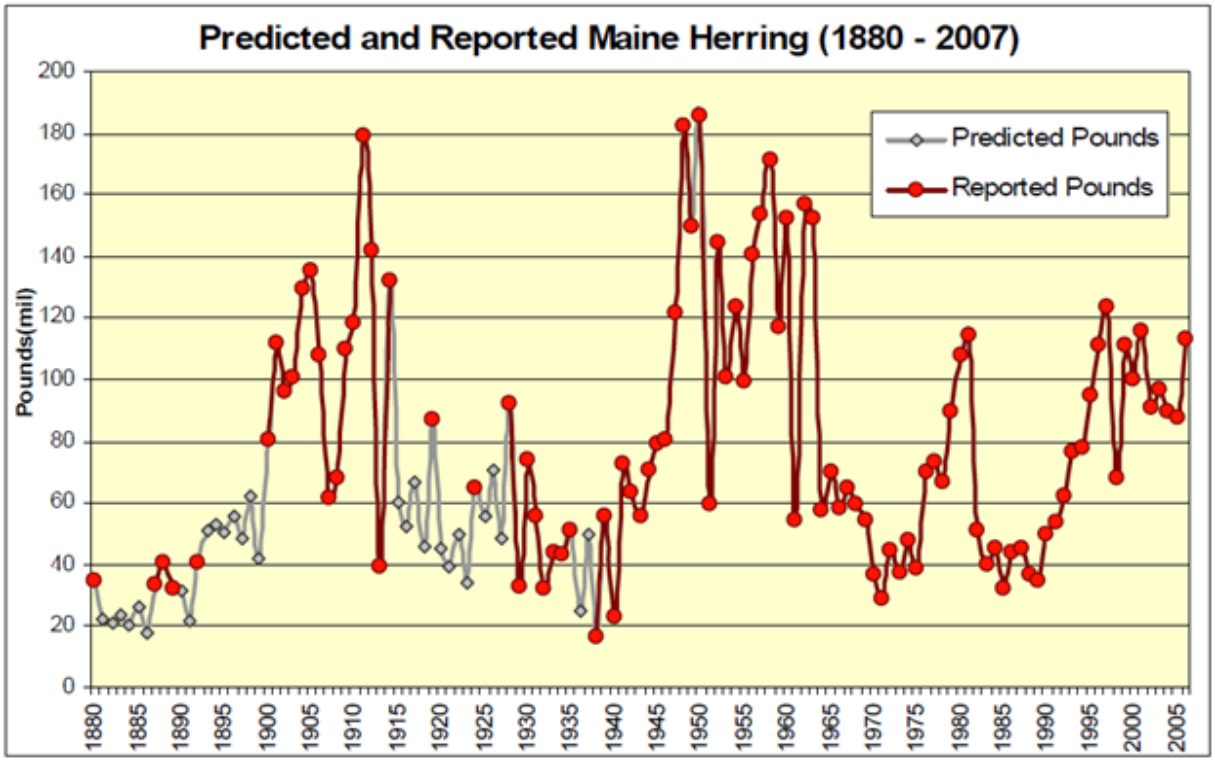
First, the time series and qualitative time line were built utilizing fishery data (both electronic and paper sources) and information on salinity, sea surface temperature, socioeconomic data and industry events. Next, the data were modeled to determine underlying patterns, and intervention analysis was used to determine impacts of socioeconomic and industry events on the fishery (by comparing landings to qualitative literature). Finally, correlations between the fishery and oceanographic features were investigated.

Both a Maine herring time series and a Canadian herring time series were completed using the Backcasting method (Figure 48 and Figure 49 – see thesis for more detail), meaning that some values

were predicted and some were from records (reported). The results of the ARIMA modeling (also described in the thesis) for Maine herring were statistically significant and revealed that the catch in one year could be, to some extent, explained by the catch in the previous two years. The pattern was not thought to be illogical; small pelagic fish populations that mature quickly are known to respond rapidly to fishing pressure. For the Canadian herring the same explanatory pattern was not established, and the next years catch were more dependent on an error term than previous years catch.

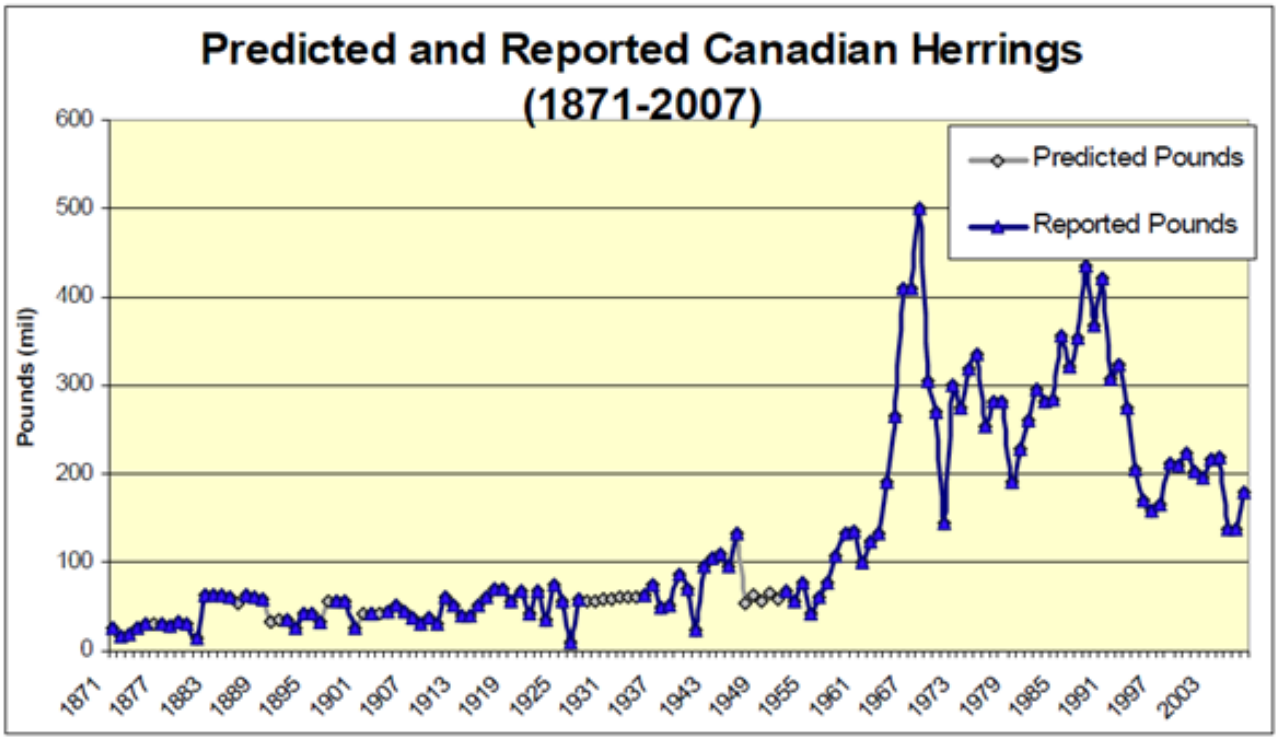
The study results also suggested that landings were not coupled with sea surface temperature and salinity, and that other environmental factor should be examined. The results were contrary to previous studies which have shown relationships between herring and the environment, but were not deemed conclusive.

Figure 48 Completed Maine Herring Time Series, Reported and Predicted Values, 1871-2007



Source: Klein, 2003

Figure 49 Completed Canadian Herring Time Series, Reported and Predicted Values, 1871-2007



Source: Klein, 2003

5.1.5 Importance of Herring as a Forage Species

This section serves to update and summarize available information on the role of herring as a forage species since the summary in Amendment 1.

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 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 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. During the development of the 2010-2012 herring fishery specifications, the Council considered factors identified by the SSC when setting ABC and accounting for scientific uncertainty, including recruitment, biomass projections, and the importance of herring as a forage species. The approach selected by the Council for specifying ABC for 2010-2012 provided for a technically-sound way to address annual variability in catch and fishing effort while remaining consistent with SSC advice and slightly more conservative than some approaches that were considered. Future stock assessments and specifications for the herring fishery will continue to address this important issue. More information on this process can be found in Amendment 4. Current assumptions as of the 2009 TRAC regarding natural mortality can also be found herein.

Information to quantify the importance of herring as a forage species is still lacking, however a series of new literature that describes the role of herring in the ecosystem has been published. Atlantic herring is considered a keystone prey species in the Northeast US shelf ecosystem. They are consumed by demersal and pelagic fish, marine mammals, and seabirds in addition to human exploitation. The role of fishes, mammals, and seabirds can be found in section 5.1.5.1, and more specific information on the role of herring as prey and bait can be found in Section 5.5.1.6 of this document.

An inclusive review of published literature pertaining to herring in an ecosystem context is presented below. Since the publishing of the papers presented, nothing new predator or prey relationships with Atlantic herring have been discovered. The NEFSC Ecosystem Assessment Program is currently working in conjunction with the Population Dynamics Branch and the Food Web Dynamics Program on consumption estimates of a whole range of herring predators, to ultimately aid in the calculation of M2 for Atlantic herring, as well as to better derive Atlantic herring biological reference points. The Program is also working on a series of other management strategy modeling, of which herring is just one species among many. The results of these models and analysis will be considered comprehensively in the 2012 Atlantic herring SAW/SARC.

5.1.5.1 Ecosystem Modeling (Mammals, Seabirds and Fish)

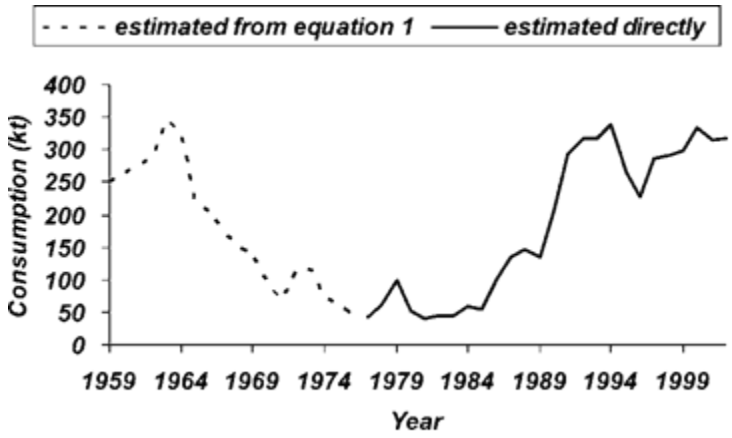
Overholtz and Link (2007) estimated the total annuals removal of herring from the ecosystem by predator species for the period 1977-2002, using different modeling approaches, assumptions, and data inputs, depending on the information available. Twelve demersal fish species were identified as important predators of herring, including eight species managed by NEFMC: Atlantic cod, pollock, silver hake, white hake, red hake, monkfish, winter skate, and thorny skate. Other demersal fish predators include spiny dogfish, summer flounder, bluefish, and sea raven. Other important predators of herring include marine mammals (fin, humpback, minke, and pilot whales, harbor porpoises, Atlantic white-sided dolphins, harbor seals and grey seals), large fish (bluefin tuna, shortfin mako sharks, and blue sharks), and seabirds (northern fulmar, black legged kittiwake, northern gannet, herring gull, great black-backed gull, and three types of shearwaters).

Between 1977 and 2002, total consumption of herring increased as herring abundance increased. Removals by demersal fish, which were evaluated based on trawl survey abundance indices and stomach content analyses, constituted the largest source of predation mortality for Atlantic herring, followed by marine mammal, large pelagic fish, and seabird removals. The importance of demersal fish predation is underscored by a decline in total herring consumption during the mid-late 1990s, when cod, spiny dogfish, and white hake were at low abundance. During the second half of the time series, removals by piscine, mammalian, and avian predators combined were estimated to be roughly three times greater than fishery removals (300,000 mt vs. 100,000 mt). The authors noted that herring are vulnerable to predation throughout their lifespan, unlike other fish species which have substantially reduced predation rates once they reach advanced size/age, and they emphasized the importance of considering removals due to predation during stock assessment.

Building on their work, Overholtz, Jacobson and Link (2008) utilized the values of consumption and their 80% confidence intervals to create new Biological Reference Points (BRPs) and estimate predation and fishing mortality on herring. Previous assessment work was also utilized and developed. The impact of predation mortality on the BRPs was also analyzed through several different methods.

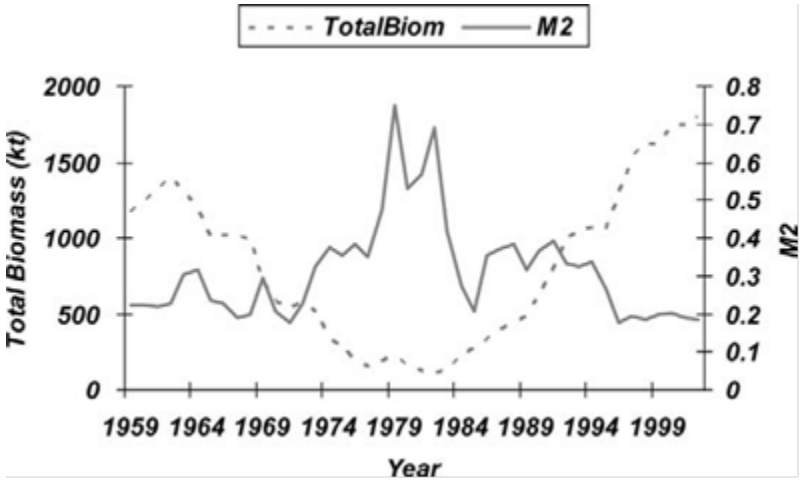
Overall, the authors estimated that predators often consumed more herring than the amount harvested by the fishery between 1959 and 2002, and that predation was likely important to the herring dynamics in the Gulf of Maine/Georges Bank area. Predation fell by more than two-thirds from 1964 to the late 1970's, but increased again by the early 1990s, peaking in 1994 (Figure 50). The large dip was the result of both predator consumption and fishing mortality falling during those years. Predation rates, as exhibited as a Predation Mortality Rate (M_2) an herring biomass were found to be opposing, with biomass at its lowest in the late 1970's and early 80's while M_2 peaked (Figure 51). The predation mortality rate was more stable when total biomass increased in the late 1990s.

Figure 50 Total Consumption of Gulf of Maine–Georges Bank Atlantic Herring by All Predators, Including Fishing, 1959–2002



Source: Overholtz et al 2008

Figure 51 Comparison of Atlantic Herring Biomass and Predation Mortality Rate (M_2) in the Gulf of Maine–Georges Bank Region, 1959–2002



Source: Overholtz et al 2008

The new BRPs, which account for the fishery and predation, were different than when there was no predation component; MSY_f was found to be 222 kt, $Bmsy_f$ was found to be 896 kt, and $Fmsy_f$ was found to be 0.25. With the assumption that the total biomass available is 1,452 kt, the available yield for the fishery was estimated to be 241 kt, with the possibility of the available yield to decrease in the future to 193 kt, should the marine mammal biomass increase as predicted at a rate of 3 kt per year. It was concluded that MSY reference points would be misleading if constant natural mortality was assumed when in actuality it was fluctuating, and it was recommended that M_2 be included in future analysis of prey fish dynamics.

5.1.5.2 Updated Information About Other Species Interactions

Tuna

While a direct link between tuna and herring abundance has not been conclusively determined, tuna are known predators of herring. A study by Bradford Chase (2002) examined the diets of 819 Atlantic bluefin tuna off the Atlantic continental shelf between the years of 1988 and 1992. The sampling occurred during the fishing season (July-October) and was conducted on commercial and recreationally caught tuna stomachs. The research showed that although the primary sustenance varied by region, Atlantic herring, in addition to sand lance, Atlantic mackerel, squid and bluefish, were a primary prey species. Atlantic herring were typically between the ages of 2 and 4 when preyed upon. Out of the 568 stomachs that contained prey, 167 contained herring, which is a 29% frequency of occurrence. The percent weight of those 167 stomachs was found to be 53% herring. These percentages were second only to sand lance in the study. When analyzed by location it was found that the percent frequency of occurrence and percent by weight was highest at Jaffreys Ledge (74% and 87%, respectively), and second highest at the Great South Channel (27% and 48%, respectively).

A study by Golet *et al* (2007) noted the decline in northern Bluefin tuna in the last decade, with fewer mature fish and a decline in the commercial catch quality, despite an abundance of herring for forage purposes. A numerical value for the physical condition of the northern Bluefin tuna was assigned through a multinomial logit model, which utilized fat and oil content, as well as fish shape. Fishermen's logbooks were utilized to gather the information, and the model predicted the probability that tuna would be in a certain quality grade. The study found a significant decline in the quality over time. The probability that a fish would be found in a lower Grade (C+) increased between 1991 and 2003, with a 68-75% chance that a fish caught in 2003 would be in that class, versus a 10-20% chance in the early 90's. By 2004 less than 1% of the commercial catch was comprised of a Grade B fish.

The authors suggested that the decline in quality could be a result of a decline in the amount, quality, or availability of herring in the Gulf of Maine during the tuna's five month feeding period in that area, as herring are the highest energy density prey in the region. As a counterpoint, however, they cite the 2003 stock assessment, which pointed to a large abundance of herring in the area during the study. One theory was therefore put forth that the energy density of the herring could have been in decline, which may have been forcing the tuna to expend more energy to catch the herring or switch to other forms of prey. An overall cause for the decline in tuna quality was therefore not able to be identified through the study, and cannot be directly linked to herring.

Cod, Haddock, Herring, and Skates

Fauchald (2010) describes the relationship between cod and herring as a potential relationship which has experienced hysteresis, or internal feedback, within the ecosystem in the North Sea. The author poses that herring are a substantial food source for cod, however the intense fishing pressure on cod has removed the predator control on herring by cod, and subsequently herring have begun to exert pressure on cod recruitment through predation on larvae and eggs. In order to examine this relationship, 44 years of data on cod recruitment and herring abundance were analyzed in conjunction with data on copepods, sea surface temperature and the size of cod stock.

The study determined that a combination of herring stock size and copepod abundance dictated the different aspects of the cod dynamics. Copepod abundance tended to explain year to year variations in the cod population while herring explained five-year time trends, specifically the low recruitment in the 1960's and now, as well as the high recruitment in the early 1990s as well as 1980. While the work did not occur in the Northeast region, the relationship of predation by both species on each other is one that could be potentially applied here.

In another study, McQuinn (2009) proposed that the rising trend in the western Newfoundland herring bottom trawl index was caused by an increase in the availability of herring biomass near the seafloor, made possible by the absence of cod predators. Consequently, the bottom trawls appear to have captured a change in the distribution of herring in the water column, and not a true change in abundance.

To determine this conclusion he utilized data from various trawl surveys and an acoustic survey and information from the Canadian DFOs analytical stock assessment. The bottom trawl indices were re-examined in two ways: through the construction of an ecosystem model and as a major element in ecosystems in relation to other fish population abundance. One of the other major points that the McQiuinn paper noted was the deficiencies in trawl survey data, and subsequent link to poor assessments of the role of herring in cod populations

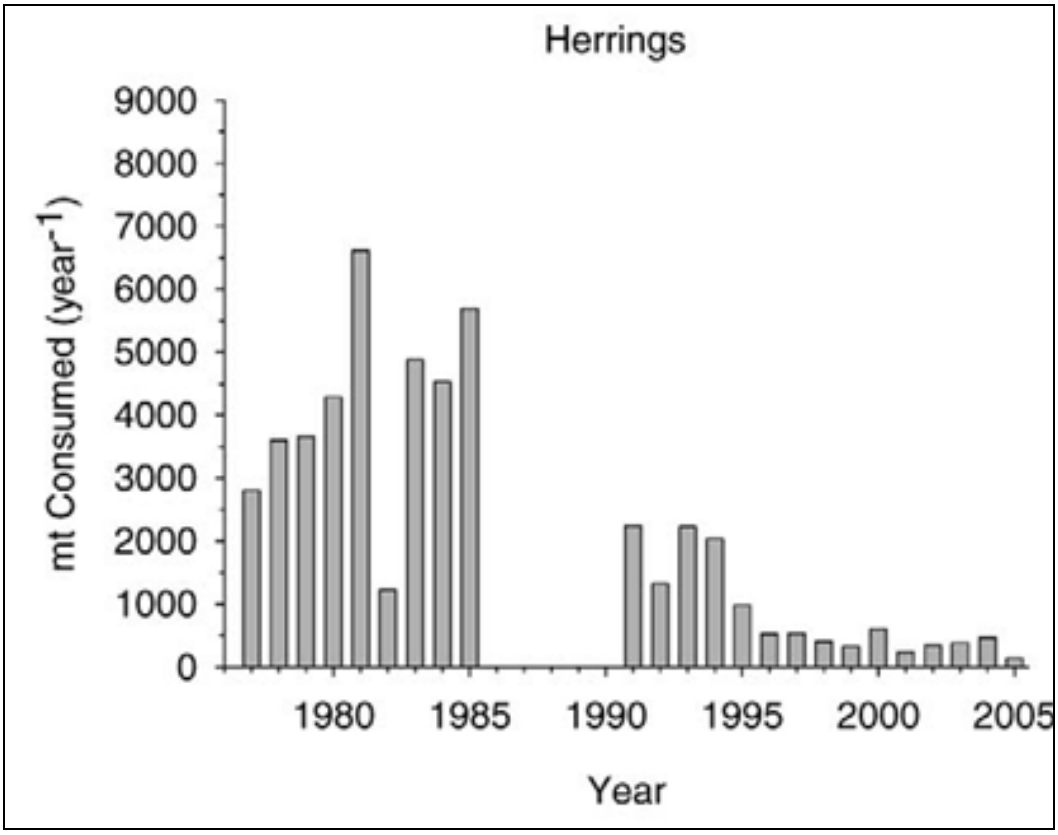
A study in press by Richardson et al demonstrates that haddock predation can have a substantial effect on the survival rate of Atlantic herring eggs. Numerous studies on both sides of the Atlantic have shown that haddock are the dominant predator of benthic herring eggs. The Richardson et al. study quantifies the impact of haddock predation on herring egg survival rates. An assumption of their methodology is that early stage larval herring abundance (an index of egg hatching) is a function of herring spawning stock biomass (i.e., an index of egg production) and herring egg survival rates from haddock predation.

In the study it is estimated that egg survival rates has varied from about 70% in the early 1990s and 1970s to <2% currently. This variability depends on the size of the haddock population and the spawning stock biomass of herring. It is also proposed that egg predation by the abundant 2003 year class of haddock caused a substantial decline in herring egg survival rates starting in 2004, as indicated by a >90% decline in larval herring abundance. The low abundance of herring larvae has continued through the present. This low level of larval production in recent year may have a negative impact on the herring population.

The effect of herring consumption for skates was examined as a part of a larger study by Link and Sosebee (2008) on the consumption of skates as a predator in the northeast US Continental Shelf ecosystem. In the study seven species of skate were examined to determine consumption rates for each species as well as an overall skate consumption rate for consideration from an overall ecosystem perspective, although only three skate species were covered in detail in the publication. Data came from the NMFS bottom trawl survey, including the food habits collection data.

The individual species analysis found that for thorny skate, the majority of the prey removed was herrings (Clupeidae), silver hake, and "other fish." It was calculated that the thorny skate could remove up to 8,000 mt of these species in a given year, but 1981 was calculated to be the highest year of herring predation, with close to 7,000 mt consumed in that year (Figure 52). The consumption of all skates relative to the ecosystem analysis found that while herring have a large amount of biomass removed from the ecosystem by skates, the amount is small in comparison to the fishery removals (0.44 mt removals/fishery landings, where 1 indicates that more prey is consumed by skates than the fishery). The removal of herring by skates was also found to be low in comparison to the standing stock biomass and annual production ($5.09x10^3$, $2.04x10^6$, and $7.55x10^5$ mt, respectively).

Figure 52 Consumptive Removals of Herrings (Clupeidae) by Thorny Skate, 1976-2005



Source: Link and Sosebee (2008)

5.2 NON-TARGET SPECIES AND OTHER FISHERIES

5.2.1 Non-Target Species

"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.

5.2.1.1 Standardized Bycatch Reporting Methodology (SBRM)

A summary of the Herring PDT's work with bycatch data from the SBRM (Standardized Bycatch Reporting Methodology) and the SBRM process can be found in the impacts discussion of the management measures (Section 6.2) More detailed discussion and analyses are provided in Appendix III, Volume II (*Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*).

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.

5.2.1.2 Data from NMFS Sea Sampling (Observer) Program

The following summary tables have been provided by the NEFOP (Northeast Fisheries Observer Program) based on observer data from 2009-2010, unless otherwise noted.

Key for All Tables in this Section

- Years represent calendar years January 1 – December 31
- Otter trawl midwater (OTM), pair trawl midwater (PTM), and purse seine (PUR) data are reported for all haul data (including observed and unobserved hauls) recorded by observers
- Otter trawl finfish (OTF), or bottom trawl data are reported for observed hauls
- Observed pair trawl operations have been counted as one trip when only one observer was aboard two vessels or when only one vessel landed catch; those trips with an observer on both boats when both landed fish have been counted as two separate trips
- Permit Categories reflect Amendment 1 – A/B Limited Access All Areas, C Limited Access Incidental Catch, D Open Access Incidental Catch

Fish NK

A detailed description of fish, NK and herring, NK can be found in Section 6.3.2.1 of this document.

Species Grouping

In the following summary tables species groups were created to condense the number of species presented from 260 to 27 of the predominantly caught. Predominance was determined by descending order of catch weight:

- "Debris" includes shells, seaweed, eggs and bones
- "Dogfish" is predominantly composed of Spiny dogfish
- "Flounders" is predominantly composed of Winter, Summer, Yellowtail, and American Plaice
- "Other Fish" is predominantly composed of Croaker, Menhaden, Sea Raven, Bluefish, Hagfish, and Spotted Hake
- "Other Groundfish" is predominantly composed of Redfish
- "Other Invertebrates" is predominantly composed of sand dollar, sponge, and Horseshoe Crab
- "Other Fish" is predominantly composed of Winter and Little skates
- "Squid" is predominantly composed of *ilex*

Table 10 summarizes coverage rates from the 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 10 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 following tables were provided by the Herring PDT during the development of the Amendment 5 alternatives and Draft EIS; these tables disaggregate observer data for the 2009 and 2010 fishing years by herring gear type, permit category, and "season" (expressed in six-month periods) to provide the Council with perspective on bycatch issues in the fishery when developing the catch monitoring alternatives for this amendment.

Table 11 summarizes the coverage rates from the NEFOP for 2009 and 2010 by the Herring permit category and gear type covered in this section, which is divided by the months in each Quarter. For each count of observed trips in the table there is a corresponding table of catch and discards. For instance, there were 39 observed trips that took place between January and March on Category A paired midwater trawl vessels, the data from those 39 trips was used to create the summary presented in Table 12. There were no observed purse seine trips between January and March in both 2009 and 2010. The data for observed single midwater trips had to be combined for the periods between January and June as well as July and December for confidentiality reasons.

Table 11 Number of Observed Trips 2009/2010 by Gear, Category, and Six-Month "Season"

	Category	Mesh Size	Number of Trips	
			January – June	July – December
Single and Paired Midwater Trawls	A/B	All	135	252
Purse Seine	A	All	28	73
Bottom Otter Trawl	A/B	Small	48	81
		Large	45	68
	C Only	Small	63	87
		Large	62	132
	D	Small	312	355
		Large	805	1,027
		Unknown	82	144

Table 12 summarizes the catch and discards of all species that were caught on 387 observed trips on paired and single midwater trawl vessels holding a Category A or B permit for 2009 and 2010, broken down by a half year time period. Fish NK represent fish that are pumped to a paired vessel without an observer onboard (kept catch), and fish that are discarded/released.

Table 12 Catch and Discards of All Species on Observed Trips, 2009-2010, Paired and Single Midwater Trawl, Permit Category A and B

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	659	42,457	43,116	58	79,194	79,252
BASS, STRIPED	114		114		20	20
BUTTERFISH	149	801	950	14	9,129	9,143
COD, ATLANTIC	106	158	264	1,198	3,224	4,422
Debris	965		965	3,896		3,896
Dogfish	128,824	15,955	144,779	301,602	14,353	315,955
FISH, NK	945,922	904,687	1,850,609	1,588,088	3,305,350	4,893,438
Flounders		3	3	12	498	510
HADDOCK	3,891	60,837	64,728	1,917	143,343	145,260
HAKE, RED (LING)	23		23	10	5,785	5,795
HAKE, SILVER (WHITING)	1,261	10,019	11,280	781	91,524	92,304
HAKE, WHITE		26	26	4	294	298
HERRING, ATLANTIC	79,227	30,567,937	30,647,163	118,033	80,286,031	80,404,064
HERRING, BLUEBACK	752	28,764	29,516	13	104,130	104,143
HERRING, NK	855	209,765	210,620	25,662	4	25,666
LOBSTER, AMERICAN				9	36	45
MACKEREL, ATLANTIC	62,239	11,864,308	11,926,547	204	792,744	792,948
MONKFISH (GOOSEFISH)		11	11	149	68	216
Other Fish	789	6,978	7,767	8,469	44,821	53,290
Other Groundfish	184		184	968	11,237	12,205
Other Invertebrates				239	249	488
POLLOCK	528	740	1,268	979	4,483	5,461
SCALLOP, SEA					79	79
SCUP	688	2,064	2,752		1,429	1,429
SHAD, AMERICAN	96	5,057	5,153	157	21,399	21,556
Skates	6	24	30	271	303	574
Squid	127	2,914	3,041	801	28,646	29,447
GRAND TOTAL	1,227,404	43,723,504	**44,950,908**	2,053,535	84,948,370	**87,001,905**

Table 13 summarizes the catch and discards of all species that were caught on 101 observed trips on purse seine vessels holding a Category A or B permit for 2009 and 2010, broken down by a half year time period. Herring, mackerel, haddock, dogfish and fish NK comprise the majority of observed catch.

Table 13 Catch and Discards of All Species on Observed Trips, 2009-2010, Purse Seine, Permit Category A and B

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE				1	549	550
BASS, STRIPED						
BUTTERFISH				3	100	103
COD, ATLANTIC						
Debris	0		0	1,210	486	1,696
Dogfish	1,960		1,960	19,976	13,625	33,601
FISH, NK	64,408	435,000	499,408	496,029	452,000	948,029
Flounders						
HADDOCK						
HAKE, RED (LING)						
HAKE, SILVER (WHITING)		44	44	2	3,581	3,583
HAKE, WHITE						
HERRING, ATLANTIC	838	2,309,791	2,310,629	3,532	9,354,536	9,358,068
HERRING, BLUEBACK	1	340	341	1	493	494
HERRING, NK	200	12	212	2,440	130,000	132,440
LOBSTER, AMERICAN	13		13			
MACKEREL, ATLANTIC	0	3,764	3,764	50	5,489	5,539
MONKFISH (GOOSEFISH)	3		3	12		12
Other Fish	4	6	10	3	40	43
Other Groundfish						
Other Invertebrates	0	11	11		133	133
POLLOCK				71		71
SCALLOP, SEA	2		2			
SCUP						
SHAD, AMERICAN					128	128
Skates	11		11			
Squid		60	60	1	2,750	2,751
GRAND TOTAL	67,442	2,749,028	**2,816,469**	523,329	9,963,910	**10,487,239**

Table 14 summarizes the catch and discards of all species that were caught on 113 observed trips on otter trawl (bottom) vessels holding a Category A or B permit utilizing large mesh for 2009 and 2010, broken down by a half year time period. Large mesh constitutes any mesh size greater than 5.5 inches.

Table 14 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Large Mesh (>5.5 inch)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	158		158	39		39
BASS, STRIPED	113	21	134	1,107		1,107
BUTTERFISH	19	15	34	860	148	1,008
COD, ATLANTIC	14,484	124,799	139,283	24,720	60,107	84,827
Debris	6,206		6,206	6,137		6,137
Dogfish	68,894	1,179	70,073	66,037	6,922	72,959
FISH, NK	787		787	340		340
Flounders	68,406	111,490	179,896	30,287	143,009	173,295
HADDOCK	20,883	888,056	908,938	3,896	650,201	654,097
HAKE, RED (LING)	2,176	13	2,189	2,667	4	2,670
HAKE, SILVER (WHITING)	1,840	150	1,990	5,257	735	5,992
HAKE, WHITE	270	29,449	29,719	779	34,739	35,518
HERRING, ATLANTIC	284		284	182		182
HERRING, BLUEBACK	1		1	17		17
HERRING, NK	2		2	13		13
LOBSTER, AMERICAN	6,782	15,798	22,579	6,476	8,689	15,165
MACKEREL, ATLANTIC	313	58	371	36		36
MONKFISH (GOOSEFISH)	10,974	136,183	147,156	3,537	92,083	95,621
Other Fish	21,521	1,500	23,021	21,270	1,404	22,674
Other Groundfish	11,601	33,849	45,450	4,650	36,954	41,604
Other Invertebrates	24,657	66	24,723	27,790	23	27,812
POLLOCK	208	170,684	170,892	716	86,497	87,213
SCALLOP, SEA	3,205	3,599	6,803	6,460	7,968	14,428
SCUP	2,315	982	3,297	1,707	8,144	9,850
SHAD, AMERICAN	164	6	170	74		74
Skates	599,676	212,522	812,198	393,239	507,627	900,866
Squid	311	29	341	2,895	15,340	18,235
GRAND TOTAL	866,249	1,730,445	**2,596,694**	611,184	1,660,594	**2,271,778**

Table 15 summarizes the catch and discards of all species that were caught on 129 observed trips on otter trawl (bottom) vessels holding a Category A or B permit utilizing small mesh for 2009 and 2010, broken down by a half year time period. Small mesh constitutes any mesh size less than 5.5 inches.

Table 15 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Small Mesh (<5.5 inch)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	358	1,136	1,494	259	1,481	1,740
BASS, STRIPED	7,808	125	7,933	1,354	138	1,492
BUTTERFISH	22,995	4,393	27,388	76,035	6,908	82,943
COD, ATLANTIC	90		90	11	1,371	1,382
Debris	7,258		7,258	3,517		3,517
Dogfish	71,254	6,743	77,997	64,080	10,452	74,532
FISH, NK	159		159	25,257		25,257
Flounders	7,000	2,126	9,126	11,494	5,238	16,732
HADDOCK				7		7
HAKE, RED (LING)	2,049	1,407	3,456	13,762	2,772	16,534
HAKE, SILVER (WHITING)	2,811	18,831	21,642	40,375	41,874	82,249
HAKE, WHITE	3		3	15		15
HERRING, ATLANTIC	14,126	465,279	479,405	93	196,347	196,440
HERRING, BLUEBACK	172	3,353	3,525	46	2,549	2,595
HERRING, NK		77,300	77,300	11,586	129	11,715
LOBSTER, AMERICAN	204	90	293	2,908	281	3,189
MACKEREL, ATLANTIC	15,920	1,125,075	1,140,994	411	772	1,183
MONKFISH (GOOSEFISH)	35	494	529	837	812	1,649
Other Fish	6,778	2,374	9,152	28,167	8,303	36,470
Other Groundfish	3,046	982	4,028	3,487	842	4,329
Other Invertebrates	5,886		5,886	6,625		6,625
POLLOCK	1		1			
SCALLOP, SEA		167	167	6,931	6,659	13,590
SCUP	13,997	2,152	16,149	12,522	27,149	39,670
SHAD, AMERICAN	824	1,666	2,490	334	35	369
Skates	17,271		17,271	30,058	784	30,842
Squid	24,621	4,607,508	4,632,128	113,130	5,531,787	5,644,917
GRAND TOTAL	224,663	6,321,199	**6,545,862**	453,299	5,846,681	**6,299,980**

Table 16 summarizes the catch and discards of all species that were caught on 194 observed trips on otter trawl (bottom) vessels holding a Category C permit utilizing large mesh for 2009 and 2010, broken down by a half year time period. Large mesh constitutes any mesh size greater than 5.5 inches. Information from observed trips taken by vessels which held both B and C permits was grouped with that taken from observed trips taken by vessels holding Category A and B permits.

Table 16 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Large Mesh (>5.5)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	27		27	7		7
BASS, STRIPED	6		6	1,149	92	1,241
BUTTERFISH	36	409	445	160	36	196
COD, ATLANTIC	14,435	71,335	85,770	8,326	171,385	179,711
Debris	9,239		9,239	10,034	33	10,067
Dogfish	22,168	1,327	23,495	80,550	14,945	95,495
FISH, NK	235		235	46		46
Flounders	31,589	149,463	181,052	39,191	136,071	175,262
HADDOCK	376	103,167	103,543	87	5,983	6,069
HAKE, RED (LING)	4,567	2,610	7,177	2,425	12	2,437
HAKE, SILVER (WHITING)	1,245	27,000	28,245	2,075	625	2,700
HAKE, WHITE	51	2,688	2,739	131	12,997	13,128
HERRING, ATLANTIC	139	4	143	715	200	915
HERRING, BLUEBACK	6		6	53		53
HERRING, NK						
LOBSTER, AMERICAN	5,623	9,991	15,614	9,542	8,774	18,316
MACKEREL, ATLANTIC	31	1,693	1,724	3		3
MONKFISH (GOOSEFISH)	2,833	25,028	27,861	4,961	39,313	44,274
Other Fish	10,788	771	11,559	19,493	3,872	23,365
Other Groundfish	2,696	1,835	4,530	1,537	2,648	4,185
Other Invertebrates	6,960	57	7,017	13,650	321	13,971
POLLOCK	3	15,264	15,267	266	16,895	17,162
SCALLOP, SEA	2,587	7,014	9,601	10,163	19,143	29,306
SCUP	2,998	28	3,025	2,241	2,003	4,244
SHAD, AMERICAN	13		13	42		42
Skates	309,917	118,661	428,577	307,423	223,235	530,658
Squid	348	102	449	1,572	479	2,050
GRAND TOTAL	428,915	538,444	**967,359**	515,840	659,062	**1,174,903**

Table 17 summarizes the catch and discards of all species that were caught on 150 observed trips on otter trawl (bottom) vessels holding a Category C permit utilizing small mesh for 2009 and 2010, broken down by a half year time period. Small mesh constitutes any mesh size less than 5.5 inches. Information from observed trips taken by vessels which held both B and C permits was grouped with that taken from observed trips taken by vessels holding Category A and B permits.

Table 17 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Small Mesh (<5.5 inch)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	86	39	125	1,698		1,698
BASS, STRIPED	3,495	3,547	7,041	3,724	402	4,126
BUTTERFISH	23,901	5,820	29,721	26,627	3,810	30,436
COD, ATLANTIC		48	48	127	59	186
Debris	3,913		3,913	1,189		1,189
Dogfish	116,992	6,623	123,615	59,678	9,993	69,671
FISH, NK	3,215	10	3,225	206	43	249
Flounders	27,950	28,107	56,057	21,516	14,727	36,243
HADDOCK	83		83	2,254		2,254
HAKE, RED (LING)	33,662	3,518	37,180	57,382	4,947	62,328
HAKE, SILVER (WHITING)	21,815	148,418	170,233	68,036	184,199	252,236
HAKE, WHITE	1,009	2,171	3,180	1,295	1,072	2,367
HERRING, ATLANTIC	1,733		1,733	6,198	1,888	8,085
HERRING, BLUEBACK	1,009	595	1,604	91		91
HERRING, NK	189	483	672	844		844
LOBSTER, AMERICAN	732	415	1,146	3,277	1,254	4,531
MACKEREL, ATLANTIC	1,825	1,741	3,566	354	669	1,023
MONKFISH (GOOSEFISH)	5,513	2,658	8,171	3,029	4,111	7,140
Other Fish	50,327	240,820	291,147	44,241	58,025	102,266
Other Groundfish	2,511	10,430	12,941	6,007	2,894	8,900
Other Invertebrates	3,450	19	3,468	3,204	4	3,208
POLLOCK	2		2	1		1
SCALLOP, SEA	12,228	86	12,314	57,065	10,775	67,840
SCUP	73,161	210,158	283,319	16,069	31,536	47,605
SHAD, AMERICAN	334	4	338	1,379		1,379
Skates	24,446	1,324	25,770	62,260	1,077	63,337
Squid	11,037	112,487	123,524	21,331	507,018	528,348
GRAND TOTAL	424,616	779,519	**1,204,135**	469,081	838,500	**1,307,581**

Table 18 summarizes the catch and discards of all species that were caught on 1,832 observed trips on otter trawl (bottom) vessels holding a Category D permit utilizing large mesh for 2009 and 2010, broken down by a half year time period. Large mesh constitutes any mesh size greater than 5.5 inches.

Table 18 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Large Mesh (>5.5 inch)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	698		698	1,272	6	1,278
BASS, STRIPED	5,826	129	5,955	6,446	126	6,572
BUTTERFISH	214	112	326	940	177	1,117
COD, ATLANTIC	264,180	1,562,992	1,827,172	147,369	1,235,412	1,382,781
Debris	244,138		244,138	194,306		194,306
Dogfish	546,797	9,683	556,480	594,996	46,153	641,149
FISH, NK	12,812	310	13,122	2,845	6	2,851
Flounders	632,261	2,280,465	2,912,726	659,033	2,715,370	3,374,403
HADDOCK	29,296	3,475,315	3,504,611	9,708	1,849,054	1,858,762
HAKE, RED (LING)	27,120	2,077	29,196	20,878	1,198	22,076
HAKE, SILVER (WHITING)	21,206	5,144	26,350	31,889	7,538	39,427
HAKE, WHITE	8,654	604,587	613,241	10,251	483,362	493,613
HERRING, ATLANTIC	1,188	97	1,285	4,983	41	5,024
HERRING, BLUEBACK	351	3	354	542	70	612
HERRING, NK	212		212	79		79
LOBSTER, AMERICAN	147,057	243,622	390,679	155,351	149,042	304,393
MACKEREL, ATLANTIC	1,074	105	1,179	216	248	463
MONKFISH (GOOSEFISH)	151,401	1,405,098	1,556,499	65,369	801,720	867,089
Other Fish	239,796	29,775	269,572	236,345	16,885	253,231
Other Groundfish	98,954	654,433	753,387	76,960	584,602	661,562
Other Invertebrates	236,750	16,413	253,162	274,274	165,126	439,400
POLLOCK	9,089	1,513,880	1,522,969	9,126	1,025,097	1,034,223
SCALLOP, SEA	229,373	245,853	475,227	155,326	185,966	341,293
SCUP	12,525	15,711	28,236	19,756	16,624	36,381
SHAD, AMERICAN	1,249	18	1,267	538	2	540
Skates	5,079,610	2,744,309	7,823,919	6,859,257	2,423,835	9,283,092
Squid	4,222	1,083	5,305	15,717	3,610	19,328
GRAND TOTAL	8,006,050	14,811,215	**22,817,265**	9,553,773	11,711,268	**21,265,041**

Table 19 summarizes the catch and discards of all species that were caught on 667 observed trips on otter trawl (bottom) vessels holding a Category D permit utilizing small mesh for 2009 and 2010, broken down by a half year time period. Small mesh constitutes any mesh size less than 5.5 inches.

Table 19 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Small Mesh (<5.5 inch)

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	4,507	50	4,557	2,320	1,253	3,573
BASS, STRIPED	11,454	20,827	32,280	7,497	4,351	11,848
BUTTERFISH	46,878	23,419	70,297	153,637	22,142	175,779
COD, ATLANTIC	789	4,907	5,696	1,296	4,915	6,210
Debris	16,898		16,898	20,637		20,637
Dogfish	467,347	46,463	513,810	267,363	79,178	346,541
FISH, NK	321	180	500	14,411	201	14,612
Flounders	146,387	288,732	435,119	138,914	217,942	356,856
HADDOCK	3,645	698	4,343	2,453	150	2,603
HAKE, RED (LING)	79,003	29,553	108,555	132,724	63,749	196,473
HAKE, SILVER (WHITING)	74,400	699,548	773,948	203,669	762,013	965,682
HAKE, WHITE	395	2,228	2,623	1,660	3,297	4,957
HERRING, ATLANTIC	4,387		4,387	30,344	24,625	54,970
HERRING, BLUEBACK	496	3	499	3,308	4	3,312
HERRING, NK	527	234	761	5,658	10	5,668
LOBSTER, AMERICAN	4,730	3,994	8,723	11,996	6,965	18,961
MACKEREL, ATLANTIC	6,825	35,822	42,647	7,551	9,071	16,622
MONKFISH (GOOSEFISH)	10,513	15,271	25,784	8,165	16,128	24,293
Other Fish	201,059	448,531	649,590	197,169	426,806	623,975
Other Groundfish	30,583	49,105	79,687	21,635	5,364	26,998
Other Invertebrates	44,189	30,097	74,285	87,741	114,791	202,531
POLLOCK	88	2,741	2,829	60	4,003	4,063
SCALLOP, SEA	151,105	4,101	155,206	348,467	55,915	404,382
SCUP	153,452	321,170	474,622	48,880	66,428	115,308
SHAD, AMERICAN	1,044	472	1,516	2,789	174	2,963
Skates	232,277	55,787	288,065	479,644	23,060	502,704
Squid	32,133	407,033	439,165	93,040	1,334,612	1,427,652
GRAND TOTAL	1,725,430	2,490,964	**4,216,393**	2,293,029	3,247,143	**5,540,172**

Table 20 summarizes the catch and discards of all species that were caught on 226 observed trips on otter trawl (bottom) vessels holding a Category D permit utilizing an unknown mesh size for 2009 and 2010, broken down by a half year time period. An "unknown" mesh size means that the mesh size measurement is omitted from the data for one of various reasons.

Table 20 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Unknown Mesh Size

	January - June			July-December		
Species	**Lbs Disc**	**Lbs Kept**	**Total Lbs**	**Lbs Disc**	**Lbs Kept**	**Total Lbs**
ALEWIFE	1,056		1,056	4		4
BASS, STRIPED	785	6,151	6,936	891	56	947
BUTTERFISH	10,163	1,651	11,814	52,202	1,782	53,984
COD, ATLANTIC	5,037	50,165	55,202	6,380	168,738	175,118
Debris	7,398		7,398	20,845		20,845
Dogfish	76,501	2,720	79,221	70,286	5,683	75,969
FISH, NK	692		692	71	13	84
Flounders	29,714	107,598	137,312	50,396	247,115	297,511
HADDOCK	1,113	129,386	130,499	441	220,562	221,003
HAKE, RED (LING)	9,279	1,720	10,999	3,638	429	4,067
HAKE, SILVER (WHITING)	12,986	54,335	67,321	22,783	8,922	31,705
HAKE, WHITE	270	12,339	12,609	948	38,697	39,645
HERRING, ATLANTIC	472		472	4,192		4,192
HERRING, BLUEBACK	137		137	68		68
HERRING, NK	31		31	101		101
LOBSTER, AMERICAN	7,694	11,198	18,892	13,421	12,006	25,427
MACKEREL, ATLANTIC	258	73	330	200	1,655	1,855
MONKFISH (GOOSEFISH)	9,408	57,268	66,676	6,995	84,388	91,383
Other Fish	48,645	14,534	63,179	40,925	4,312	45,236
Other Groundfish	5,518	13,449	18,968	4,824	72,227	77,051
Other Invertebrates	15,428	98	15,526	36,510	990	37,501
POLLOCK	112	29,615	29,728	1,419	95,750	97,169
SCALLOP, SEA	11,208	4,288	15,496	14,947	68,733	83,681
SCUP	8,794	30,865	39,660	3,315	5,476	8,791
SHAD, AMERICAN	437	18	455	452		452
Skates	205,469	128,663	334,132	578,559	200,325	778,884
Squid	855	28,996	29,850	14,779	139,293	154,073
GRAND TOTAL	469,460	685,130	**1,154,590**	949,593	1,377,151	**2,326,744**

5.2.1.3 State Observer Data

The ME DMR small mesh bottom trawl (SMBT) sampling project is funded for 40 sea days between 2011 and 2012 (December 2010-April 2011 and December 2011-April 2012). The State of ME has a Memorandum of Understanding (MOU) with NOAA that allows funds to be directed to NEFOP samplers so that data are collected in a manner that is consistent with NEFOP protocols. The State of ME also runs an observer sampling program under their own funds. A few SBMT trips were sampled in December 2010 and are included in the 2010 observer data being utilized by the PDT in Amendment 5, but the majority of the SMBT fishery and related sampling efforts by ME DMR occurred in early 2011, during the winter fishery (January – April).

A total of 14 trips have been observed within the Small Mesh Area 1 in the GOM during 2010 and 2011. Of these 14 trips, the total amount of river herring (comprising of Alewife and Blueback Herring) observed was 103 lbs. This is less than 1% of the total Atlantic herring landings in this fishery.

An additional 14 trips were observed during the winter fishery for Atlantic Herring in Area 2 in 2010. Similar to the GOM, of these 14 observed trips, less than 1% of river herring (4,645 lbs.) were observed with respect to the total landings of Atlantic herring.

During the summer of 2011, NMFS* conducted 20 (of 30) observed trips onboard small mesh bottom trawl vessels harvesting either Atlantic herring or silver hake (whiting) in the GOM. However, without accurate information on trip designation (i.e. a "herring" trip vs. a "whiting" trip), these extra trips cannot be included into the coverage rates for 2011, yet.

**Personal communication with Tad Beagley.*

Table 21 Total Number of Trips Observed for the Directed Atlantic Herring Fishery in Area 1A (Small Mesh Area 1) and Area 2 (Rhode Island)

	Observed			Trips Fished			
Year	**Area 1**	**Area 2**	**Total**	**Area 1**	**Area 2**	**Total**	**% Cover**
2010	8	14	22	123	166	289	7.61
2011	6	n/a	6	61	n/a	61	9.84
Total	14	14	28	184	166	350	

Table 22 Total Catch (Retained and Discards) in Pounds of Species Observed on SMBT Fishing Trips During 2010 and 2011 in Area 1A – Small Mesh Area 1

SPECIES	POUNDS CAUGHT
HERRING, ATLANTIC	73,229
DOGFISH, SPINY	16,392
HAKE, SILVER (WHITING)	15,106
HAKE ATLANTIC RED	2,712
PLAICE, AMERICAN	273
MACKEREL, ATLANTIC	234
BUTTERFISH	182
LOBSTER, AMERICAN	169
COD, ATLANTIC	161
HADDOCK	139
FISH, NK	69
ALEWIFE	66
SQUID, NK	47
HERRING, BLUEBACK	37
FLOUNDER, ATLANTIC WITCH (GREY SOLE)	29
FLOUNDER, WINTER	26
MONKFISH	24
SQUID, LOMG-FINNED	22
FLOUNDER, YELLOWTAIL	19
SHAD, AMERICAN	19
LUMPFISH	15
SKATE, LITTLE	12
FLOUNDER, FOURSPOT	11

Table 23 Total Catch (Retained and Discards) in Pounds of Species Observed on SMBT Fishing Trips During 2010 in Area 2

SPECIES	POUNDS CAUGHT
HERRING, ATLANTIC	778,809
HAKE, SILVER (WHITING)	6,400
HERRING, NK	6,163
ALEWIFE	4,413
SKATE, LITTLE	661
DOGFISH, SPINY	397
HERRING, BLUEBACK	232
MACKEREL, ATLANTIC	178
LOBSTER, AMERICAN	172
FLOUNDER, WINTER (BLACKBACK)	127
SHAD, AMERICAN	118
SCULPIN, LONGHORN	114
CRAB, SPIDER, NK	91
CRAB, TRUE, NK	79
COD, ATLANTIC	74
SKATE, WINTER (BIG)	66
OCEAN POUT	55
HAKE, NK	34

5.2.1.4 State Portside Sampling Programs

For more information on State Portside Sampling Programs, as well as Herring PDT analysis of the data produced, see the two papers "Comparison of (Landed) Bycatch Estimates from Portside and At-Sea Observer Sampling Programs in the Atlantic Herring fishery (July 2010)" and "A Comparison of Portside and At-Sea Sampling Methods of Estimating Bycatch in the Atlantic Herring Fishery", located in Appendix II of this document (Volume II).

ME DMR Portside Bycatch Survey

ME DMR's portside sampling program represents an opportunity to collect data in an inexpensive but efficient and accurate way. The program takes advantage of normal processing plant operations by quantifying bycatch that enters the facilities. Processing plants have to manually remove other species from the production line before the fish are sorted and cut or frozen. In normal operations, bycatch removed from the product is segregated into xactix bins or totes and removed from the processing floor at the end of each lot. Plants process one lot (fish caught by one vessel on a particular trip, delivered by truck or boat) at a time and then reset the plant in preparation for the next lot. Therefore, the bycatch removed from each lot can be documented and assigned to a catch location, gear type, date and a total lot amount. Additionally, the plants generally buy herring from vessels throughout the fishery and therefore cover multiple gear types, vessel sizes and individual fishing practices.

The survey sampling takes place at bait dealer and processing plants dewatering boxes in Maine, New Hampshire, Massachusetts, Rhode Island and New Jersey. A sampling level of five percent per sampler of the entire herring fishery is targeted. The mackerel fishery is sampled when herring samples are not available; this scenario is most likely to occur in the winter months when many of the herring vessels switch to the mackerel fishery. The samplers quantify bycatch from individual lots according to a NMFS specified protocol. The total weight of any observed bycatch are recorded along with species identification, total species weight, individual lengths and weights of all fish or a representative sub-sample.

A more extensive overview can be found in Amendment 1 to the Herring FMP and Appendix II of this document (Volume II). ME DMR funding for the portside and at-sea sampling program will be at approximately $300,000 for the year 2012, through a combination of Congressional allocation, and two grants through the Atlantic Coastal Cooperative Statistics Program (ACCSP) and National Fish and Wildlife Foundation, respectively. The same combination of grants is funding the program for 2011 with an approximate funding of $200,000.

MA DMF Portside Sampling

The goal of the MA DMF portside sampling program is to document commercial fishing activities and record and quantify catch composition (including size and age) of the fish landed by the Northwest Atlantic herring and mackerel fisheries. The objectives are to:

- Sample landings at the dock to acquire information on catch composition and other biological aspects of the Atlantic herring and Atlantic mackerel fisheries;
- Collaborate with Maine Department of Marine Resources (ME DMR) to implement consistent dockside sampling protocols and to increase the number of trips sampled;
- Collect biological information and samples to assist stock assessments; and
- Support the management of these fisheries by providing analyses of various state and federal fishery-dependent data (dealer landings, vessel trip reports, at-sea sampling, portside sampling)

The MA DMF portside sampling program was originally funded in large part by a grant from the Atlantic Costal Fisheries Cooperative Management Act (ACFCMA). This grant encumbers funds for travel, supplies and salary for the field coordinator. In addition, MA DMF, has provided in-kind support by adding samplers based out of the New Bedford and Gloucester field stations. In late 2010/2011, funding for portside sampling by MA DMF has been provided by the National Fish and Wildlife Foundation (NFWF) to support the Sustainable Fisheries Coalition (SFC) river herring bycatch avoidance program (see following subsection for more information about this program). The MA DMF portside sampling program is currently funded through NFWF and State funds. In late June 2012, the DMF/SMAST/SFC River Herring Bycatch Avoidance project received a no-cost extension from NFWF to provide staffing and funds for continued sampling of participating vessels landing in MA ports through 2012.

A more extensive overview of the portside sampling program can be found in Amendment 1 to the Herring FMP and Appendix II of this document (Volume II).

5.2.1.5 Industry Initiatives – River Herring Bycatch Avoidance Program

Information in this section provided by SMAST, MADMF, and SFC staff.

Sustainable Fisheries Coalition (SFC) members account for the majority of US landings of Atlantic herring and mackerel. River herring species are also encountered in these directed fisheries. Minimizing unintended bycatch has been a goal of SFC members since fisheries managers alerted the industry in 2006 that the river herring species complex was depressed. To help achieve this goal, the SFC has joined with the Massachusetts Division of Marine Fisheries (MA DMF) and the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) to develop river herring and American shad (alosine) bycatch avoidance methods through a pilot project. This collaboration seeks to develop (1) a predictive model of where alosines are likely to occur in space and time, (2) a real-time bycatch avoidance intra-fleet communication system, and (3) additional support for port sampling to inform the initiative. Three river herring bycatch avoidance systems, focusing on the times and locations with the most alosine bycatch, have been conducted. High levels of cooperation by industry members and the appearance of distinct spatial and temporal bycatch patterns within the avoidance areas suggests these systems may have resulted in reduced alosine bycatch. Several ranges of environmental variables with significantly different probabilities of catch for species of interests have been identified within the NMFS bottom trawl survey database. The MA DMF has sampled 13 of the 14 vessels that have landed in Massachusetts ports, and approximately 188 out of 360 trips (as of July 2012).

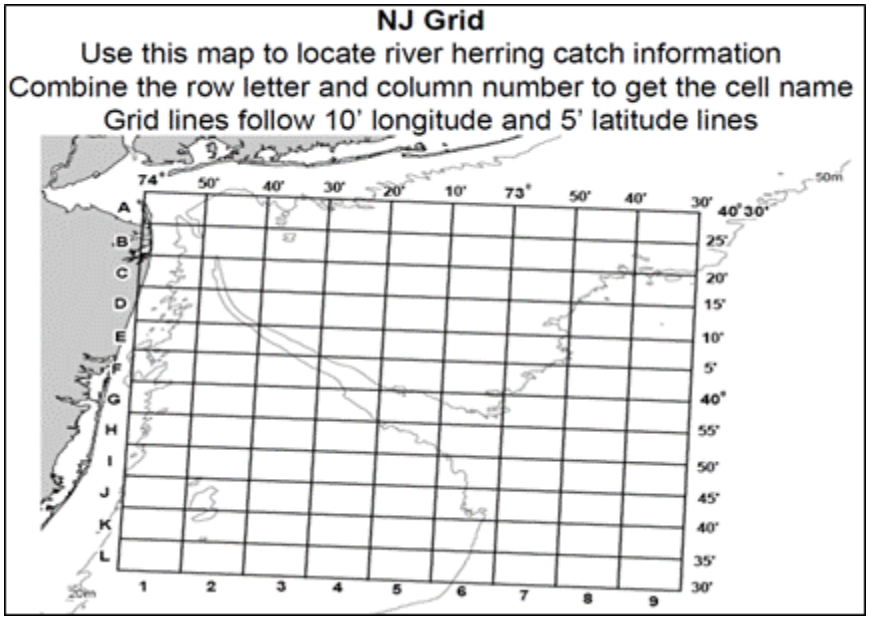
Real-Time Fleet Communication System

Since January 2011, thirteen (13) midwater trawl vessels and four (4) bottom trawl vessels have participated in four alosine bycatch avoidance systems. These voluntary bycatch avoidance systems operated under the hypothesis that alosines do not continuously school with Atlantic herring and mackerel while at sea. Therefore, 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 could be identified. The following steps were taken to implement an initial voluntary bycatch avoidance program for midwater trawl vessels landing in Massachusetts during the 2011 winter fishery (January-March).

Determine Catch Information Source: One requirement of a near-real time information system is a reliable data source that systematically calculates bycatch rates and discloses fishing locations (Gauvin et al., 1996). Two programs, the Northeast Fisheries Observer Program (NEFOP) and the MA DMF portside sampling program, provide these data. The MA DMF portside sampling program samples approximately 50% of all Massachusetts landings and prior to 2010 about 85% of all midwater trawl landings occur in Massachusetts (MA DMF, unpublished data). Edited trip-level catch composition is available about 48 hours after a vessel lands. Tow locations were available through MA DMF trip logs voluntarily completed by vessel captains. From 2009-2010, the NEFOP sampled about 40% of Atlantic herring midwater trips, though about two-thirds of these samples were from July to December (NEFMC, 2012). Uncorrected tow level data were available about five days after a vessel landed (Beagley personal comm.). Due to coverage rates and timeliness, the MA DMF portside sampling program was the primary information source for this study while NEFOP data provided tow level catch information for trips with multiple tows and high alosine bycatch.

Reduce spatial scale: The Atlantic herring and mackerel fisheries range from coastal waters to a maximum of 66˚E. During the winter, fishing effort occurs south of Cape Cod, MA to Virginia. A program over this entire range could make communications cumbersome and contains numerous alosine hotspots. An alternative approach was to conduct the program in one specific high bycatch area (Gauvin et al 1996, O'Keefe et al. 2010). Based on historic MA DMF port sampling, NEFOP data and Cournane and Correia (2010) an approximately 60x70 nm area off the coast of New Jersey was identified as the target bycatch hotspot (Figure 53).

Figure 53 Area of Focus for Winter 2011 Bycatch Avoidance System

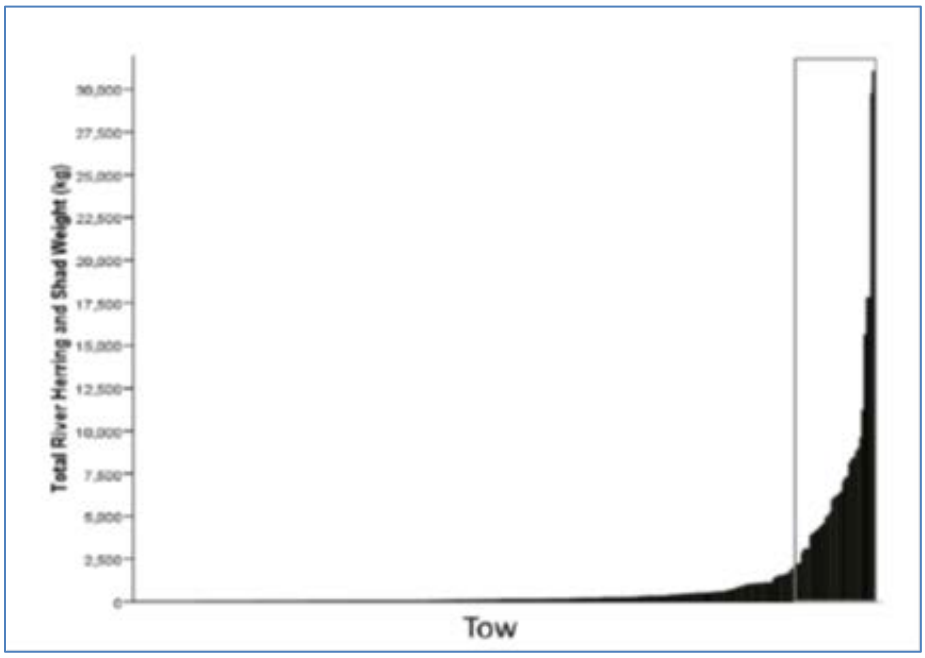


Source: SMAST. This handout was distributed to captains and used to communicate bycatch information.

Determine Thresholds to Classify Catches: Large catches of alosines in the midwater trawl fishery are uncommon but account for the vast majority of alosine bycatch. From January 2000 through September 2010 the top 10% of tows with alosine bycatch (all tows with greater than 2,000kg of alosines) accounted for over 80% of NEFOP observed alosine midwater trawl bycatch by weight (Figure 54). Thresholds were set to identify trips with these large tows (Table 24). Ratio thresholds were used instead of hard numbers to avoid biases created by small tow or trip sizes. A ratio of 1:81kg (Alosine: Target species) identified a trip in the top 10% of alosine bycatch events while a ratio of 1:425 suggested a lower bycatch event. These ratios were used to classify trips as having high (1:80, greater than 1.25% alosines), low (1:425, less than 0.2% alosines), or moderate (between 1:80 and 1:425) amounts of bycatch.

Of 72 trips sampled by MA DMF portside sampling from May 2008 – July 2010, 55 had greater than 1 kg of alosine bycatch (Table 24). The six trips with the most bycatch (top 10%) all had greater than or equal to 2,000 kg and a ratio less than 1 kg of alosines:81 kg of target species. Trips with a ratio greater than 1:425 all had less than 900 kg of bycatch. Based on this, ratios of 1:80 (1.25%) and 1:425 (0.2%) were used to indicate high and low bycatch trips, respectively. Ratios between the two represented a buffer and identified a moderate trip

Figure 54 NEFOP Observed Midwater Trawl Tows from January 2000-September 2010 Ranked Lowest to Highest by Amount of Bycatch



Source: SMAST
Of the 343 tows shown in the figure, the 35 tows with the most bycatch (grey box, top 10%) account for about 80% of observed bycatch.

Table 24 Bycatch Ratios on Top Six Trips Sampled by MA DMF

Trip rank (total alosine bycatch)	Alosine: Target ratio (kg)
1	1:49
2	1:26
3	1:63
4	1:81
5	1:72
6	1:64
14-55	>1:425

Source: SMAST

Develop Communication System: Vessels notified the MA DMF and SMAST through their shipboard e-mail system of their departure and landing times, hail weights, landing ports and other information. These emails allowed MA DMF portside samplers to meet vessels at ports and sample entire offloads. Edited and expanded catch data were relayed by MA DMF staff to SMAST less than 48 hours after vessels completed their offloads. This information as well as tow locations (from MA DMF trip logs) and any available NEFOP information was then accumulated and transformed into a weekly or bi-weekly bycatch advisory that was emailed to vessels. Bycatch information was accessed and shared with captains using a coded, grid system of small cells approximately 5x8 nm that was distributed to them (Figure 53). Based on the pace of the fishery weekly or bi-weekly advisories via email were appropriate. Advisories classify areas as either having low, moderate, or high bycatch and contained other information such as weekly bycatch rates or catches of river herring outside of the areas of focus. Information was not reported for cells without tows, and advisories only included information less than two weeks old. Cumulative bycatch information is available through the SMAST website (http://www.smast.umassd.edu/Bycatch_Avoidance/index.php).

Based upon the methods described above two additional avoidance systems for the midwater trawl fleet were implemented in the fall of 2011 and winter of 2012. The fall 2011 system targeted an area in the Gulf of Maine identified as a high river herring bycatch area. Due to a limited amount of Atlantic herring Total Allowable Catch when the Atlantic herring spawning area closure was opened to midwater trawl vessels, fishing activity occurred for approximately two weeks. Information indicating alosine bycatch was unlikely to occur at depths greater than 73 m was circulated prior to the launching of the bycatch information system. In the winter of 2012, the scope of the avoidance system was expanded to include an area off Rhode Island that is heavily utilized by the midwater fleet. The avoidance program methods were also adapted to create an avoidance program for Rhode Island small-mesh bottom trawl fishermen during the winter of 2012.

5.2.2 Other Fisheries

For the purposes of this EIS, 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.

5.2.2.1 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 in any of the Category vessels, 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 Section 5.2.1.2). 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 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 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, 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.

Table 25 shows the typical migration patterns, as determined by their locations during different months, for the various age classes of fish described above, by the state in which the migration is occurring. The columns are marked by "SA" (Some Activity), which denotes that some shad have been seen in the area during that time period, and "PA" (Peak Activity), denoting that the number of shad in the area are at a peak. The table indicates that the further north the rivers are, the later the fish will begin and conclude their migration during the year.

Table 25 Typical Migration Patterns and Locations for American Shad

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration						SA	SA	SA	PA	PA	PA	PA	PA	PA	SA									
	adult emmigration												SA	SA	PA	PA	SA								
	spawning										SA	SA	PA	PA	PA	SA									
	incubation										SA	SA	PA	PA	PA	SA									
	juvenile freshwater residence											SA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA			
	juvenile emigration													SA	SA	SA	PA	PA	PA	PA	SA	SA			
New Hampshire	adult immigration									SA	PA	PA	SA												
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence											PA	PA	PA	PA	SA	SA	SA	SA	SA	SA				
	juvenile emigration															SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration								SA	SA	PA	PA	PA	SA	SA										
	adult emmigration									SA	PA	PA	PA	SA	SA										
	spawning									SA	PA	PA	PA	SA	SA										
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	PA	SA	SA	SA					
	juvenile emigration													SA	SA	SA	PA	PA	SA	SA	SA				
Rhode Island	adult immigration							SA	SA	PA	PA	PA	SA												
	adult emmigration									SA	SA	PA	PA	SA	SA										
	spawning									SA	SA	PA	PA	PA	SA										
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence										SA	SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA		
	juvenile emigration													SA	SA	SA	SA	SA	PA	PA	PA	SA	SA		
Connecticut	adult immigration							SA	SA	PA	PA	SA	SA												
	adult emmigration										SA	SA	PA	PA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	PA	PA	SA	SA											
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	SA	PA	PA	PA	SA	SA			
New York	adult immigration							SA	PA	PA	SA	SA													
	adult emmigration								SA	PA	PA	SA													
	spawning								SA	PA	PA	SA													
	incubation								SA	PA	PA	SA													
	juvenile freshwater residence										PA	PA	PA	PA	PA	PA	SA	SA	SA	SA					
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration			SA	SA	SA	SA	PA	PA	PA	PA	SA													
	adult emmigration							SA	SA	SA	SA	SA													
	spawning						SA	SA	PA	PA	PA	SA													
	incubation						SA	SA	PA	PA	PA	SA													
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	SA	SA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA	SA			

Source: ASMFC

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 Northeast 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.

Table 26 and Table 27 show the typical migration patterns, as determined by their locations during different months, for the various age classes of fish described above, by the state in which the migration is occurring. The columns are marked by "SA" (Some Activity), which denotes that some blueback or alewife have been seen in the area during that time period, and "PA" (Peak Activity), denoting that the number of blueback or alewife in the area are at a peak.

Table 26 Typical Migration Patterns and Locations for Blueback Herring

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration							SA	SA	SA	SA	PA	PA	PA	SA										
	adult emmigration											SA	SA	PA	PA	PA	SA								
	spawning									SA	PA	PA	PA	SA											
	incubation										SA	PA	PA	SA											
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA			
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	PA	SA	SA		
New Hampshire	adult immigration								SA	PA	PA	SA													
	adult emmigration									SA	PA	PA	SA	SA											
	spawning									PA	PA	SA													
	incubation									SA	PA	PA	SA												
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA				
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration								SA	SA	PA	PA	SA	SA											
	adult emigration										SA	PA	PA	SA	SA										
	spawning									SA	PA	PA	SA	SA											
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence									SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	PA	PA	PA	SA	SA	SA	SA		
Rhode Island	adult immigration							SA	PA	PA															
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								
Connecticut	adult immigration							SA	SA	PA	PA	SA	SA												
	adult emmigration										SA	SA	PA	PA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	PA	PA	SA	SA											
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA			
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	SA	SA			
New York	adult immigration							SA	PA	PA	SA	SA													
	adult emmigration								SA	PA	SA	SA	SA												
	spawning							SA	PA	PA	PA	SA	SA												
	incubation							SA	PA	PA	PA	SA	SA												
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA						
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration			SA	SA	SA	SA	PA	PA	PA	PA	SA													
	adult emmigration							SA	SA	SA	SA	SA													
	spawning							SA	PA	PA	PA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	SA	SA	SA	SA				
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				

Source: ASMFC

Table 27 Typical Migration Patterns and Locations for River Herring

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration					SA	SA	SA	PA	PA	PA	PA	SA												
	adult emmigration										SA	SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA			
	spawning								SA	SA	PA	PA	PA	SA											
	incubation								SA	SA	PA	PA	PA	SA											
	juvenile freshwater residence								SA	SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA		
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	
New Hampshire	adult immigration									SA	PA	PA	SA	SA											
	adult emmigration										SA	PA	PA	SA											
	spawning									SA	PA	PA	PA	SA											
	incubation										SA	PA	PA	SA											
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA				
	juvenile emigration															SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration					SA	SA	PA	PA	PA	SA														
	adult emigration								SA	SA	PA	PA	SA	SA											
	spawning						SA	SA	PA	PA	SA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA	SA		
	juvenile emigration												SA	PA	PA	SA	SA	PA	PA	PA	PA	SA	SA	SA	
Rhode Island	adult immigration					SA	SA	PA	PA	PA	SA														
	adult emmigration							SA	PA	PA	SA	SA	SA												
	spawning						SA	PA	PA	PA	SA														
	incubation						SA	PA	PA	PA	PA	SA													
	juvenile freshwater residence								SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA		
	juvenile emigration											SA	SA	SA	SA	SA	SA	SA	PA	PA	PA	SA	SA		
Connecticut	adult immigration				SA	SA	PA	PA	PA	SA															
	adult emmigration				SA	SA	SA	PA	PA	SA															
	spawning				SA	SA	SA	SA	SA	SA															
	incubation					SA	PA																		
	juvenile freshwater residence							SA	SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA	SA					
	juvenile emigration									SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA					
New York	adult immigration						SA	PA	PA	PA	SA														
	adult emmigration							SA	SA	PA	SA	SA													
	spawning							SA	PA	PA	PA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA						
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration			SA	SA	SA	SA	PA	PA	PA	PA	SA													
	adult emmigration							SA	SA	SA	SA	SA													
	spawning							SA	PA	PA	PA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	SA	SA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA	SA			

Source: ASMFC

Population Management

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, New York, 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. Figure 55 and Figure 56 show current state regulations as of May 2011 for both the commercial and recreational fisheries.

Figure 55 2011 River Herring Regulations for Commercial Vessels

	SFMP Target	Season	Area Restrictions	Time Restriction	Gear Restrictions	Reporting	License	Effort Controls
ME	250 fish/acre	Yes		3 days / week escapement period		voluntary and mandatory	rights granted	Yes
NH	Harvest level that results in a harvest % that does not exceed 20% of the Great Bay Indicator Stock (provides 80% escapement level).		closures due to fishway proximity	no harvest on Wednesday	no mobile gear in state waters; restrictions on gill nets w/in inland waters	required	Yes	
MA	**Moratorium since 2005**							
RI	**Moratorium since 2006**							
CT	**Moratorium since 2002**							
NY	**Juvenile recruitment threshold**		Hudson River Only	Yes	Yes	Mandatory reporting	Yes	
NJ	**Moratorium beginning 2012**							
PA	**Moratorium beginning 2012**							
DE	**Moratorium beginning 2012**							
MD	**Moratorium beginning 2012**							
DC	**Moratorium beginning 2012**							
PRFC (bycatch fishery)	**Moratorium beginning 2012***							
VA	**Moratorium beginning 2012**							
NC	**Moratorium since 2007; 7,500 pound research set-aside; 4,000 pound limit and a permit holder restrictions (125 – 250 pounds) for the Chowan River**							
SC	**Exploitation rate and juvenile abundance**	Yes	Santee-Cooper Only		Yes	Yes	Yes	10 bushels or 250 pound / day limit
GA	**No fishery**							
FL	**No fishery**							

Source: ASMFC

Figure 56 2011 River Herring Regulations for the Recreational Fishery

	Season	Time Closure	Closed Area	Gear Restrictions	Creel Limit
ME	Yes		unlawful to fish w/in 150 ft of dam w/fishway	Hook-and-line and dip net	12 fish/day for personal use
NH	Exter River - April 1 to June 30	No harvest on Wednesday on all rivers; Except Exeter River - harvest allowed Saturday and Monday only	closures due to fishway proximity		coastal net fishery - one tote/day
MA	**Moratorium since 2005**				
RI	**Moratorium since 2006**				
CT	**Moratorium since 2002**				
NY			Hudson River Only; not within 825 ft of dam	yes	10fish/day - individual anglers; 50 fish/boat
NJ	**Moratorium Beginning 2012**				
PA	**Moratorium Beginning 2012**				
DE	**Moratorium Beginning 2012**				
MD	**Moratorium Beginning 2012**				
DC	**Moratorium Beginning 2012**				
PRFC	**Moratorium Beginning 2012***				
VA	**Moratorium Beginning 2012**				
NC	**Moratorium since 2007**				
SC	Yes		Santee-Cooper River Only	hook and line and cast nets only	1 bushel / person / day
GA	No Fishery				
FL	No Fishery				

Source: ASMFC

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. These management plans must be submitted to the TC for review by August 1, 2011. 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.

Status of Stocks

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. Recent declines of American shad were reported for Maine, New Hampshire, Rhode Island, and Georgia stocks, and for the Hudson (NY), Susquehanna (PA), James (VA), and Edisto (SC) rivers. Low and stable stock abundance was indicated for Massachusetts, Connecticut, Delaware, the Chesapeake Bay, the Rappahannock River (VA), and some South Carolina and Florida stocks. Stocks in the Potomac and York Rivers (VA) have shown some signs of recovery in recent years. 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. Given these findings, the peer review panel recommended that current restoration actions need to be reviewed and new ones need to be identified and applied. The peer review panel suggested considering multiple approaches including a reduction in fishing mortality, enhancement of dam passage, mitigation of dam-related fish mortality, stocking, and habitat restoration.

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 stock assessment technical team examined indices from fishery-dependent (directed river herring landings and bycatch estimates in ocean fisheries) and fishery-independent (young-of-year indices, adult net and electrofishing indices, coastal waters trawl surveys, and run count indices) datasets. From this information, the status of 23 stocks were determine 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 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.

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.

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, but it declined to approximately 10 million pounds per year between 1930 and 1960 and to about 2 million by 1976. Ocean harvest contributed about 11% of total Atlantic coast landings in 1978; this contribution increased yearly to approximately 67% by 1996 as ocean landings increased and in-river landings declined. The closure of the ocean-intercept fishery in 2005 lowered the coastwide total landings of American shad. Total coastwide harvest has averaged approximately 540,000 pounds annually since 2005.

Based upon landings data provided in Compliance Reports from individual states and jurisdictions, 2010 in-river American shad landings totaled 554,663, a 12% increase from 2009 (490,108 pounds). Combined landings from North Carolina and South Carolina accounted for 71% of the commercial harvest in 2010. The remainder of the in-river commercial harvest came from New Jersey, Delaware, PRFC, Virginia and Georgia. In 2010 Maine, New Hampshire, Massachusetts, Rhode Island, New York, Pennsylvania, Maryland, DC and Florida reported no directed shad harvest in their state Compliance Reports. The National Marine Fisheries Service reported landings totaling 565,944 in 2010.

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 29). In 2010, river herring landings were reported from Maine, New Hampshire, New York, New Jersey, Delaware, Maryland, the Potomac River Fisheries Commission, North Carolina, and South Carolina, totaling 2,052,601, a 9% increase from 2008 (landings from 2009 compliance reports totaled 1,885,984 pounds) and a continued increase since 2007. 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 28 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 29 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

Table 30 updates river herring catch information and provides 2011 river herring catch (in pounds) reported to the ASMFC by individual States. Maine directed landings were reported to be 1.1 million pounds, with an additional 536 pounds of shad landings reported.

Table 30 2011 State-Reported River Herring Catch

STATE	2011 River Herring Catch (Pounds)
ME*	1,151,614
NH*	4,094
MA	Moratorium
RI	Moratorium
CT	Moratorium
NY*	13,389
PA	Moratorium
DE River	2,155
NJ	0
MD	41,059
VA	26,278
Potomac River Fisheries Commission	1,672
NC*	1,611
SC*	254,037

**Indicates States with Sustainable Fishing Plans in place for 2012.*
Source: ASMFC.

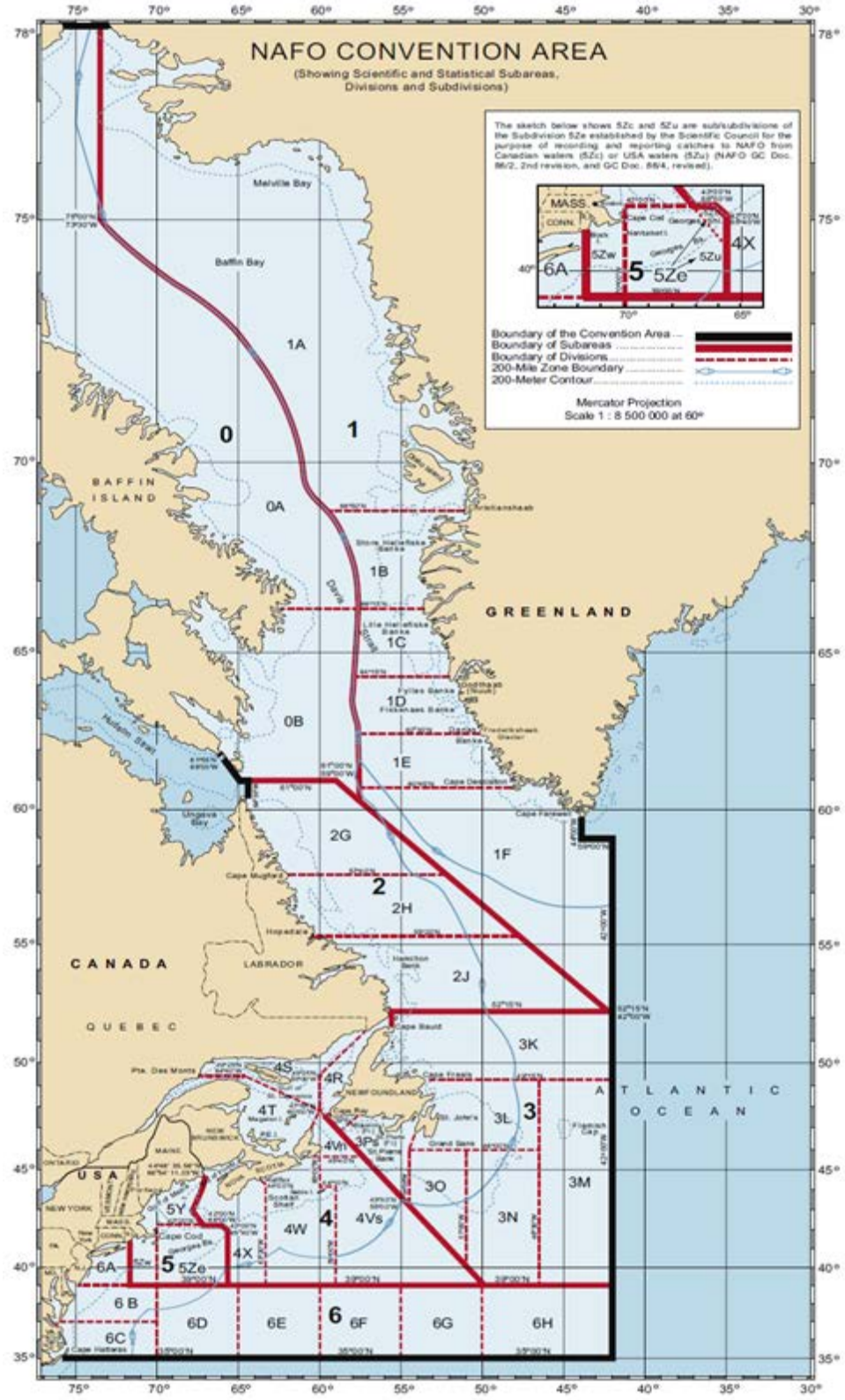
NAFO River Herring Catches, 1960-2009

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 RA is an area outside of the coastal 200 NM limit and within the NAFO Convention Area (Figure 57). In 1983, the United States established its 200 NM limit EEZ. Prior to that time, several foreign fleets along with the US fished within the would-be US EEZ. These fleets reported catches to NAFO.

Taking a historical perspective on oceanic river herring catch, reported river herring (alewife and blueback herring) catches by the US and other counties were summarized using the NAFO database 21-A (Table 31, Figure 58). These included 1960-2009 catches reported in NAFO areas 5 and 6A-C, which generally overlap the Exclusive Economic Zone of the US Northeast (Figure 57). Reported catches from unknown areas and areas outside of NAFO areas were omitted. In addition, no river herring catches were reported for 6D, which overlaps the US EEZ. The NAFO database is available at http://www.nafo.int. Note that in the NAFO database, 'blueback shad' is the same as blueback herring.

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.

Figure 57 NAFO Convention Area



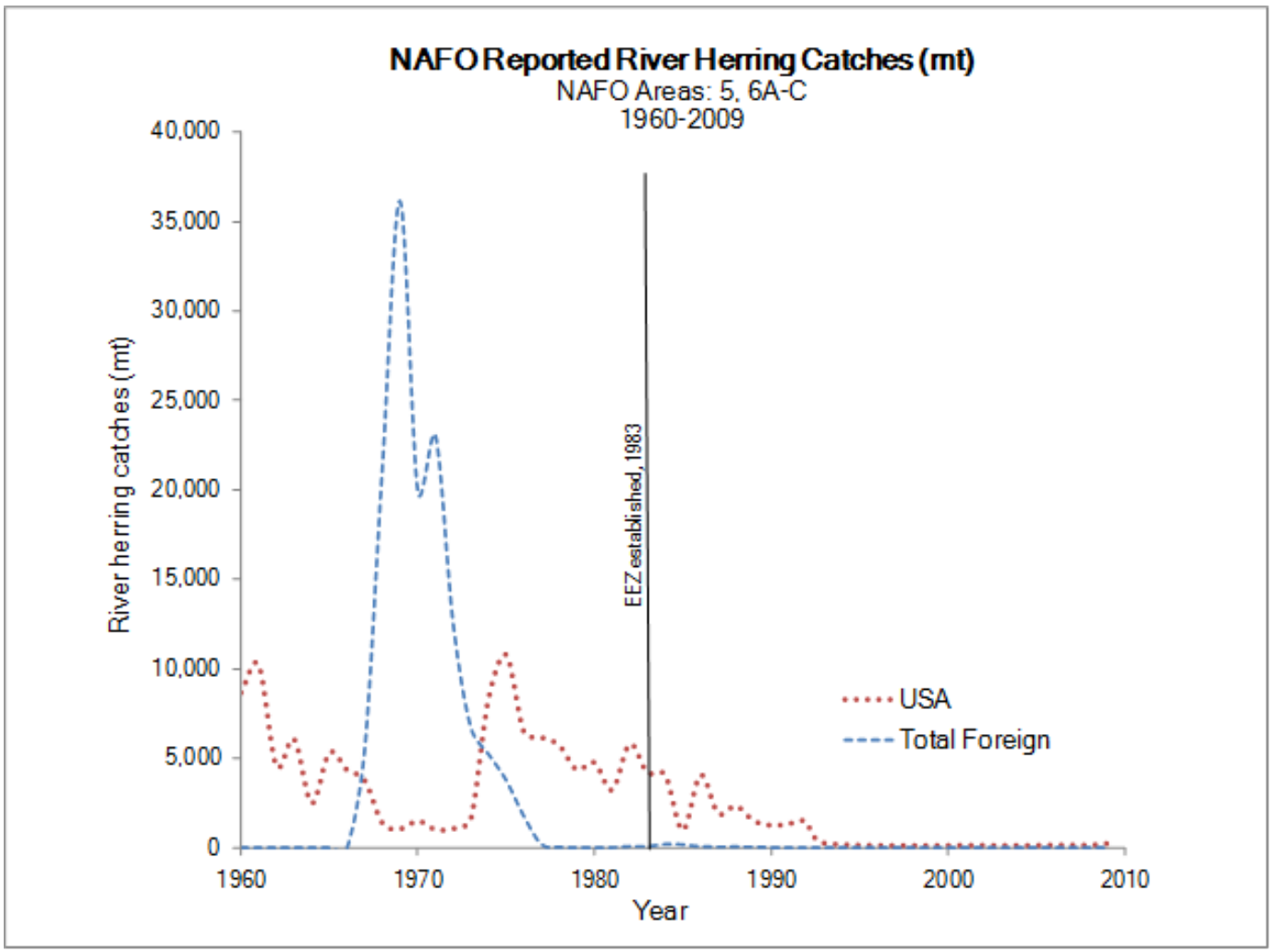
Source: NAFO, available at http://www.nafo.int/

Table 31 NAFO River Herring Catch by Country

	NAFO River Herring Catches (mt)								
	Country								
Year	Bulgaria	Germany	Spain	Poland	Romania	Russia	Total Foreign	USA	Total
1960	0	0	0	0	0	0	0	8669	8669
1961	0	0	0	0	0	0	0	10205	10205
1962	0	0	0	0	0	0	0	4572	4572
1963	0	0	0	0	0	0	0	6071	6071
1964	0	0	0	0	0	0	0	2485	2485
1965	0	0	0	0	0	0	0	5326	5326
1966	0	0	0	0	0	0	0	4344	4344
1967	0	0	0	0	0	5531	5531	3754	9285
1968	0	0	0	0	0	21235	21235	1368	22603
1969	514	113	0	0	0	35527	36154	1038	37192
1970	672	190	0	0	0	19089	19951	1493	21444
1971	1039	8409	0	2225	95	11289	23057	1005	24062
1972	512	3481	0	1888	0	6693	12574	1057	13631
1973	811	1630	0	3251	0	1065	6757	1563	8320
1974	773	2659	0	1088	252	473	5245	8293	13538
1975	553	2121	0	62	0	1039	3775	10797	14572
1976	256	1260	0	14	0	244	1774	6482	8256
1977	0	69	0	0	0	120	189	6162	6351
1978	0	0	11	0	0	21	32	5730	5762
1979	0	0	0	0	0	12	12	4358	4370
1980	0	0	2	1	0	0	3	4762	4765
1981	0	0	0	10	0	0	10	3215	3225
1982	0	0	0	81	0	0	81	5799	5880
1983	0	0	0	77	0	0	77	4184	4261
1984	0	8	0	198	0	0	206	4075	4281
1985	0	23	0	157	0	0	180	960	1140
1986	0	17	0	47	0	0	64	4058	4122
1987	0	27	0	22	0	0	49	1911	1960
1988	0	29	0	30	0	0	59	2337	2396
1989	0	23	0	24	0	0	47	1509	1556
1990	0	14	0	0	0	0	14	1237	1251
1991	0	0	0	0	0	0	0	1327	1327
1992	0	0	0	0	0	0	0	1456	1456
1993	0	0	0	0	0	0	0	250	250
2002	0	0	0	0	0	0	0	129	129
2007	0	0	0	0	0	0	0	143	143
2008	0	0	0	0	0	0	0	130	130
2009	0	0	0	0	0	0	0	231	231

Source: 1960-2009 catches reported in NAFO areas 5 and 6A-C, database 21-A, available at http://www.nafo.int/

Figure 58 NAFO River Herring Catches, 1960-2009



Source: 1960-2009 catches reported in NAFO areas 5 and 6A-C, database 21-A, available at http://www.nafo.int/

5.2.2.2 Atlantic Mackerel Fishery

A more detailed description of the Atlantic mackerel fishery can be found in 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. Section 5.5.1.3 of this document reports the average dependence on herring and mackerel by principal gear. Through the four years presented (2007-2010) pair trawl vessels and midwater trawl vessels were similarly dependent on herring and mackerel although pair trawl vessels were around 30% less dependent on herring than mackerel. Midwater trawl vessels were 20% less dependent on mackerel than herring, but by 2010 the difference was close to 50%. 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.

Unfortunately, species targeting data is sparse, and neither the dealer database nor the VTR database contains species targeting information. The NMFS Northeast Fisheries Observer Program (NEFOP) database does contain targeting information on the trip and haul level (however fishermen have reported to the Mid-Atlantic Fishery Management Council that until 2009-2010 they were not typically asked about targeting on a haul by haul level). Nonetheless, of the 128 observed hauls in 2007 targeting either mackerel or herring or both, 12% of them targeted both. Further supporting this concept, in the 2007 dealer data for the 995 trips landing greater than 20,000 pounds combined mackerel and/or herring, 13 percent of those trips landed both.

Net mesh sizes are also recorded on observer trips – observers take ten (10) random codend measurements and ten (10) random liner measurements with calipers and measured to the nearest millimeter. Many midwater trawl vessels use an outside bag (strengthener) with a large mesh and inside bag (liner) with the smaller mesh.

Between 2008 and 2010, there were a total of 117 observed mackerel tows that landed greater than or equal to 25,000 pounds of mackerel and that had usable information on mesh size. Of the 117 tows, almost all used liners and most liners (typically located inside the codend) used mesh between 1.25 and 1.75 inches (though some was as large as 3 inches). The codends themselves had mesh that ranged between 3 and 11 inches. Headrope lengths on the observed trips ranged between 150 and 600 feet. Some vessels also utilize strengtheners or chafing gear. Self-reported VTR information by the 10 vessels with the highest mackerel landings (accounting for 75% of landings in 2009) showed a similar pattern of effective mesh sizes with some additional smaller meshes (down to 0.5 inch) as well.

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/committees/SSC/SSC_Report_11-12_May_%202010.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 34,907 mt. This is much higher than 2011 landings (likely less than 1,000 mt) but also substantially lower than quotas as recently as 2010 (115,000 mt). The fishery is currently open access, but a new limited access program, detailed below, became effective for Atlantic mackerel on March 1, 2012.

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 an open access component. 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 MAFMC did consider qualifying vessels with Atlantic herring permits for at least Tier 3, regardless of their landing records (if their records qualified them for a higher Tier they would receive that higher Tier). MAFMC staff found that although some herring boats catch mackerel, the amount was not substantial. A New England representative concurred that the 20,000 pounds afforded by the open access permit should be sufficient to cover mackerel catch for these vessels in the future. The MAFMC also noted that Tier 3 is allowed 100,000 pounds of mackerel per trip, which would be a substantial amount for a large number of vessels. The MAFMC therefore made the decision to not qualify all herring vessels for a Tier 3 LAP.

The number of vessels that were expected to qualify for each tier and associated trip limits are summarized below (Table 32). The resulting capacity estimate for the vessels expected to qualify for Atlantic mackerel permits was 107,578 mt. The estimates for vessels in each Tier were based on analysis of unpublished NMFS dealer weighout data at the time, and all numbers did change as the program was implemented.

Table 32 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.

During the development of Amendment 5, the Herring Plan Development Team worked with the Mackerel Fishery Management Action Team and NMFS staff to update the estimated number of qualifiers for limited access mackerel permits and link those vessels to the Atlantic herring permits they possess. This information is provided in Table 130 and Table 131 as part of the analysis of measures to address changes to open access permit provisions for limited access mackerel vessels and can be found in Section 6.1.5 of this document.

Stock Status

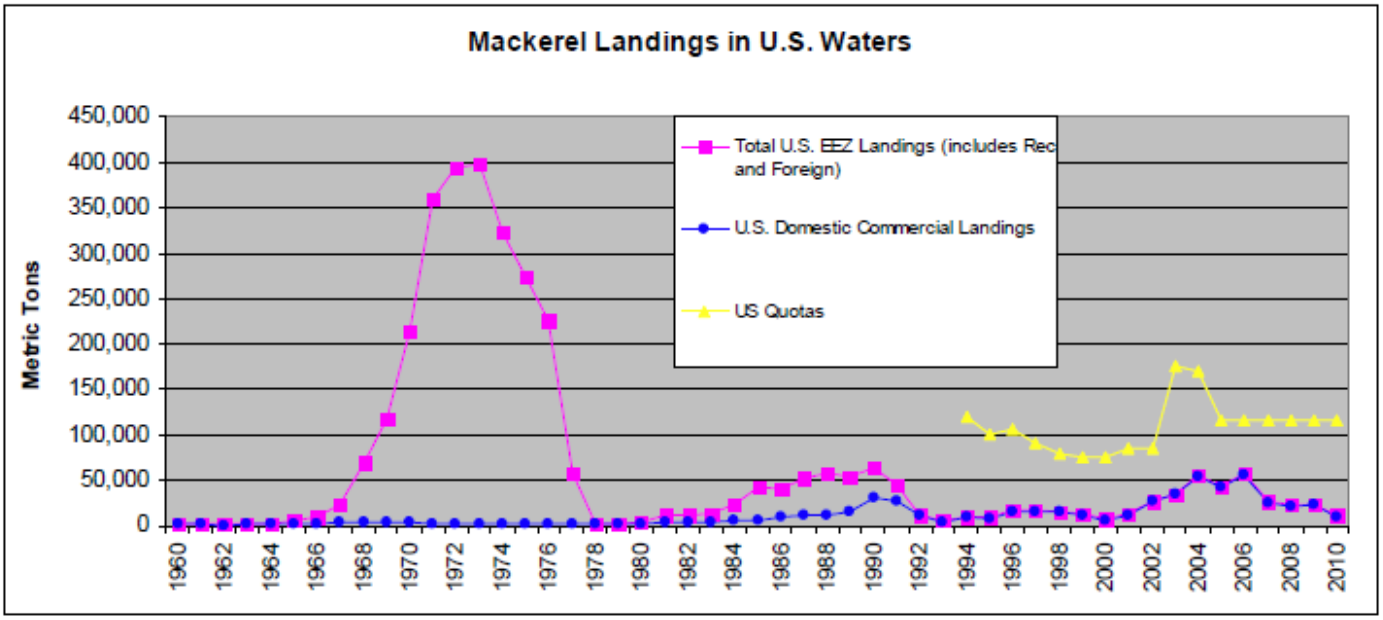
The status of mackerel is currently "unknown" with respect to both fishing mortality rates and stock size. The mackerel stock was last assessed in 2010 (utilizing data through 2008) via a joint U.S. – Canadian Transboundary Resource Assessment Committee (TRAC). The TRAC was unable to resolve uncertainties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

Fishery Performance

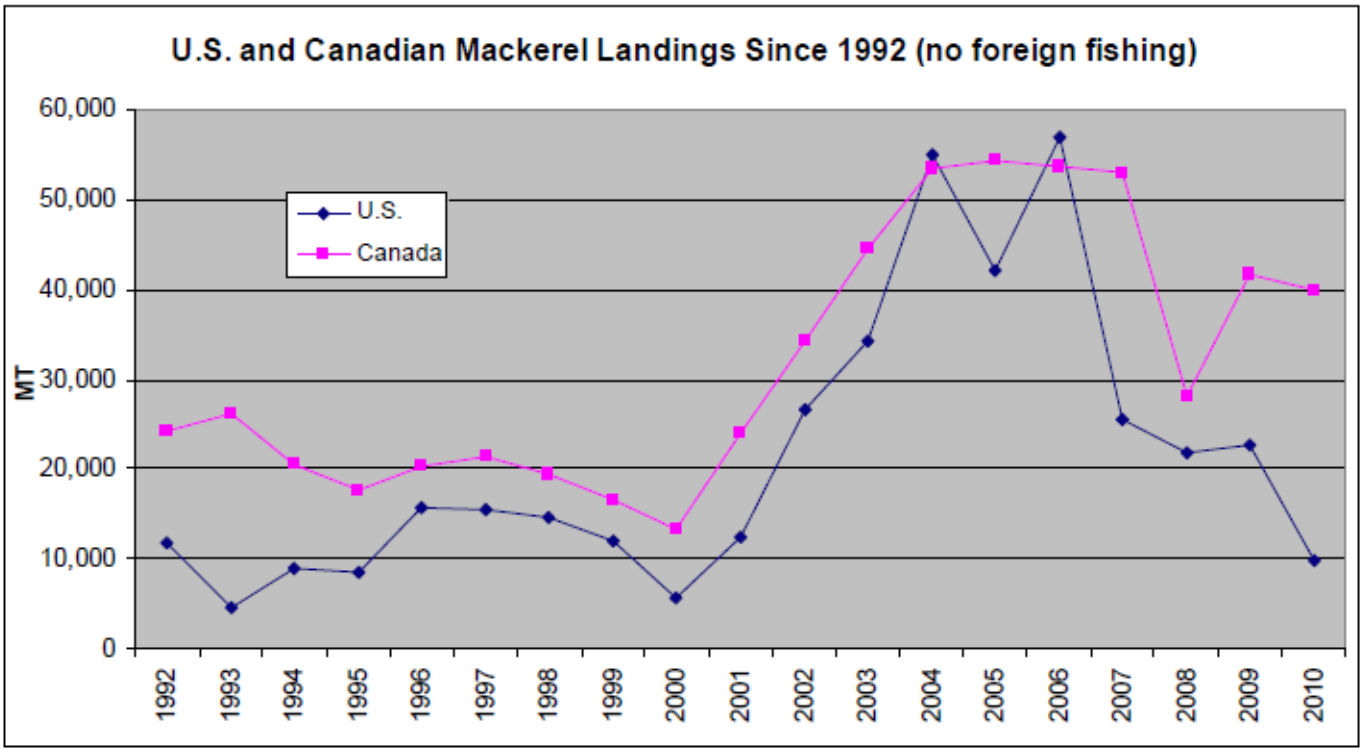
As Figure 59 and Figure 60 illustrate, catch in the fishery has varied substantially in the past 50 years. In the 1970's foreign vessels came close to landing 400,000 mt of mackerel. In the early 1980s very little mackerel was caught, but by 1990 domestic boats were catching over 25,000 mt. Landings were relatively stable during the 90'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 likely to be landed when the final annual landings are calculated. Canadian landings since 1992 are included in Figure 60.

Figure 59 Atlantic Mackerel Landings Within 200 Miles of the US Coast (2010 preliminary)



Source: TRAC 2010, unpublished NEFSC dealer reports

Figure 60 US and Canadian Atlantic Mackerel Landings (2010 preliminary)



Source: unpublished NEFSC dealer reports

The principle measure used to manage mackerel 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 33 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 34). Some aspects of mackerel management will change in 2012 with the implementation of ACLs/AMs but the basic approach of using hard quotas and in-season closures will remain. 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 33 Mackerel Quota Performance

Year	Harvest (mt) (Commercial and Recreational)	Quota (mt)	Percent of Quota Landed
1997	17,140	90,000	19%
1998	15,215	80,000	19%
1999	13,366	75,000	18%
2000	7,097	75,000	9%
2001	13,876	85,000	16%
2002	27,824	85,000	33%
2003	35,068	175,000	20%
2004	55,520	170,000	33%
2005	43,220	115,000	38%
2006	58,493	115,000	51%
2007	26,431	115,000	23%
2008	22,439	115,000	20%
2009	23,382	115,000	20%
2010	10,656	115,000	9%

Source: Unpublished NMFS Dealer Reports

Table 34 Atlantic Mackerel Landings (%) by Gear

YEAR	TRAWL OTTER BOTTOM FISH	TRAWL OTTER MID	TRAWL OTTER MID PAIRED	Other
1982	71%	0%	1%	28%
1983	34%	0%	16%	51%
1984	44%	4%	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%	44%	42%	2%
2009	30%	25%	41%	4%
2010	28%	20%	42%	10%

Source: Unpublished NMFS Dealer Reports

5.2.2.3 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 overlapping operation, Section 5.5.1 of this document reports the number of northeast multispecies permits (by category) held by herring vessels (by category). In all three years reported, herring Category D vessels hold permits in all Northeast Multispecies categories. By contrast, herring Category A, BC and C vessels hold multispecies Category A, J, K and some HB permits. Section 5.5.1.3 of this document reports the average dependence on herring and mackerel by principal gear. The Category A permit holders in the herring fishery are likely less dependent on multispecies, as their percent dependence is almost 70% on herring, mackerel and squid, and only 30% on the "other" category, which includes multispecies. Category C and D vessels, by contrast, are 85% and 97% dependent on the "other" category, which likely means a proportion of them are dependent on multispecies.

With respect to bycatch, haddock in particular are occasionally caught high in the water column, and the most recent Framework (46) modified the bycatch regulations for the herring fishery and is discussed in more detail below. Herring vessels were initially prohibited from catching groundfish when the Northeast Multispecies FMP was amended in 1996. There were also concerns that measures designed to reduce catches of groundfish by the herring fishery reduced the ability of the herring fishery to achieve optimum yield. These concerns led to herring vessels being allowed to fish in multispecies closed areas because the gear was not expected to catch groundfish. These two competing issues came to a head in 2005 when herring midwater trawl vessels caught haddock from a large haddock year class on George Bank. This led to the adoption of Framework Adjustment 43 to the Northeast Multispecies FMP in 2006. Framework 43 modified the restrictions for herring vessels so that herring fishing could continue on Georges Bank. This framework 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. The cap was set at 0.2 percent of the combined GB and GOM haddock target total allowable catch (TTAC). When the cap was reached, catches of herring from a large part of the GOM and GB areas were limited to 2,000 pounds per trip for all herring vessels.

General Fishery

The Northeast Multispecies FMP has been updated through a series of frameworks and amendments, the most recent being Framework 46 and Amendment 16. For more detailed descriptions of the fishery and the current management measures please refer to these documents.

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.

Haddock Stock Status/Landings

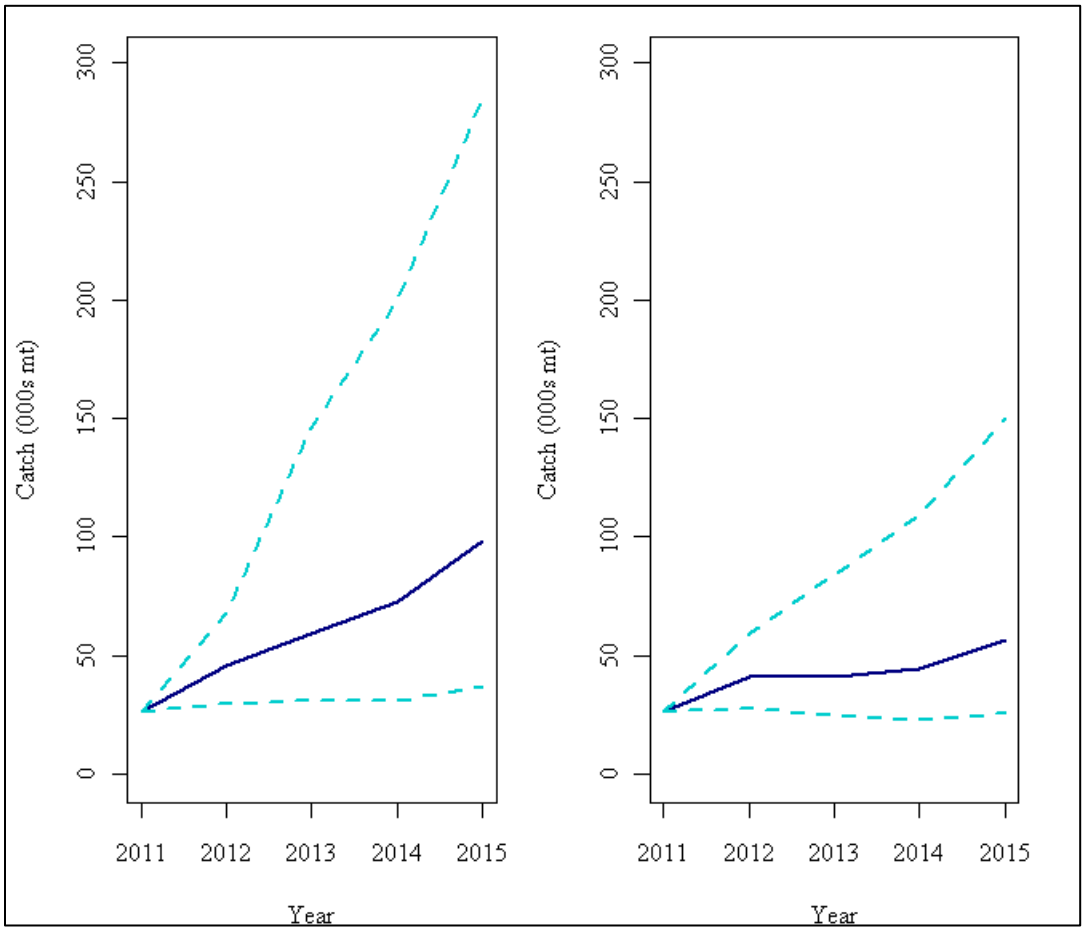
The GOM and GB haddock, *Melanogrammus aeglefinus*, is a commercially-exploited groundfish found in the northwest and northeast Atlantic Ocean. This demersal gadoid species is distributed from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland in the northwest Atlantic, where a total of six 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.

Haddock spawn over various substrates including rocks, gravel, smooth sand, and mud. Eggs are broadcast and fertilized near the bottom. Fertilized eggs are buoyant and remain in the water column where subsequent development occurs. Larvae metamorphose into juveniles in roughly 30 to 42 days at lengths of 2 to 3 cm. Small juveniles initially live and feed in the epipelagic zone. Juveniles remain in the upper part of the water column for 3 to 5 months. Juveniles visit the ocean bottom in search of food. Once suitable bottom habitat is located, juveniles settle into a demersal existence. Haddock do not make extensive seasonal migrations. In winter, haddock prefer deeper waters and tend to move shoreward in summer. Haddock are highly fecund broadcast spawners. Eggs are released near the ocean bottom in batches and fertilized by a courting male. After fertilization, haddock eggs become buoyant and rise to the surface water layer. In the Gulf of Maine, spawning occurs from early February to May, usually peaking in February to April. In the Gulf of Maine, Jeffreys Ledge and Stellwagen Bank are the two primary spawning sites. On Georges Bank, spawning occurs from January to June, usually peaking from February to early-April. Georges Bank is the principal haddock spawning area in the northeast U.S. continental shelf ecosystem. GB haddock spawning is concentrated on the northeast peak of Georges Bank.

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 61. 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 62).

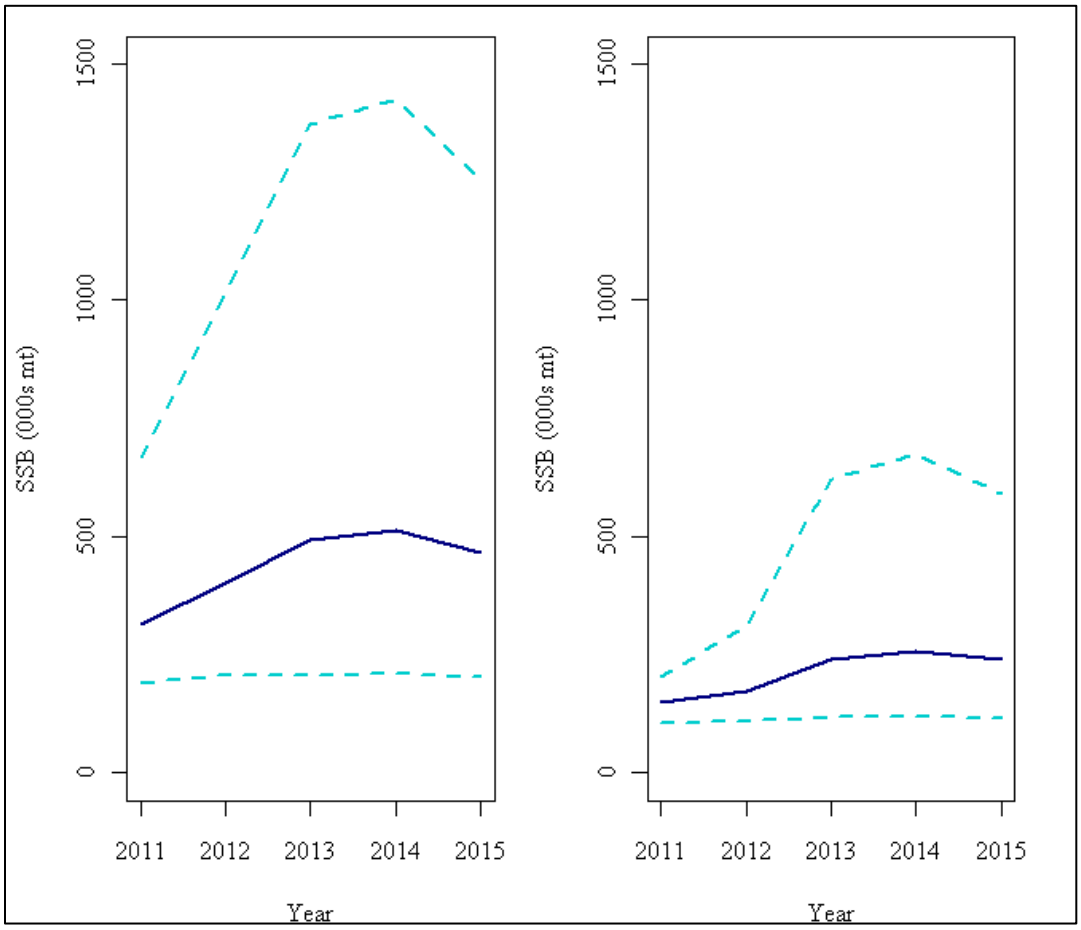
Figure 61 Georges Bank Haddock Catch Projections, 2011



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 62 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).

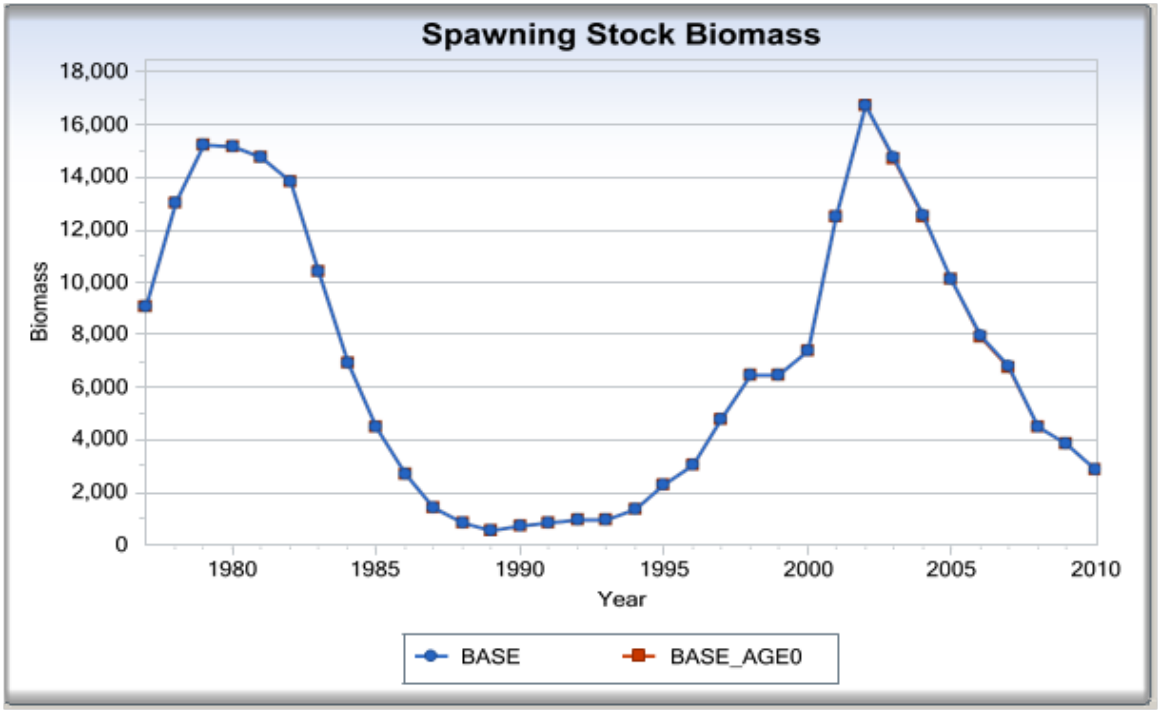
The GB haddock stock is a transboundary resource, which is co-managed with Canada. Substantial declines have recently occurred in the weights at age due to slower than average growth, particularly of the 2003 year-class. This is affecting productivity in the short-term. The growth of subsequent year-classes 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 63). 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 63). 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 63 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 63 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 35). 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 35 and Table 36 summarize 13 groundfish stocks based on GARM III results. Table 35 provides the estimates regarding biomass projections and Table 36 provides the estimates regarding fishing mortality.

Table 35 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 36 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

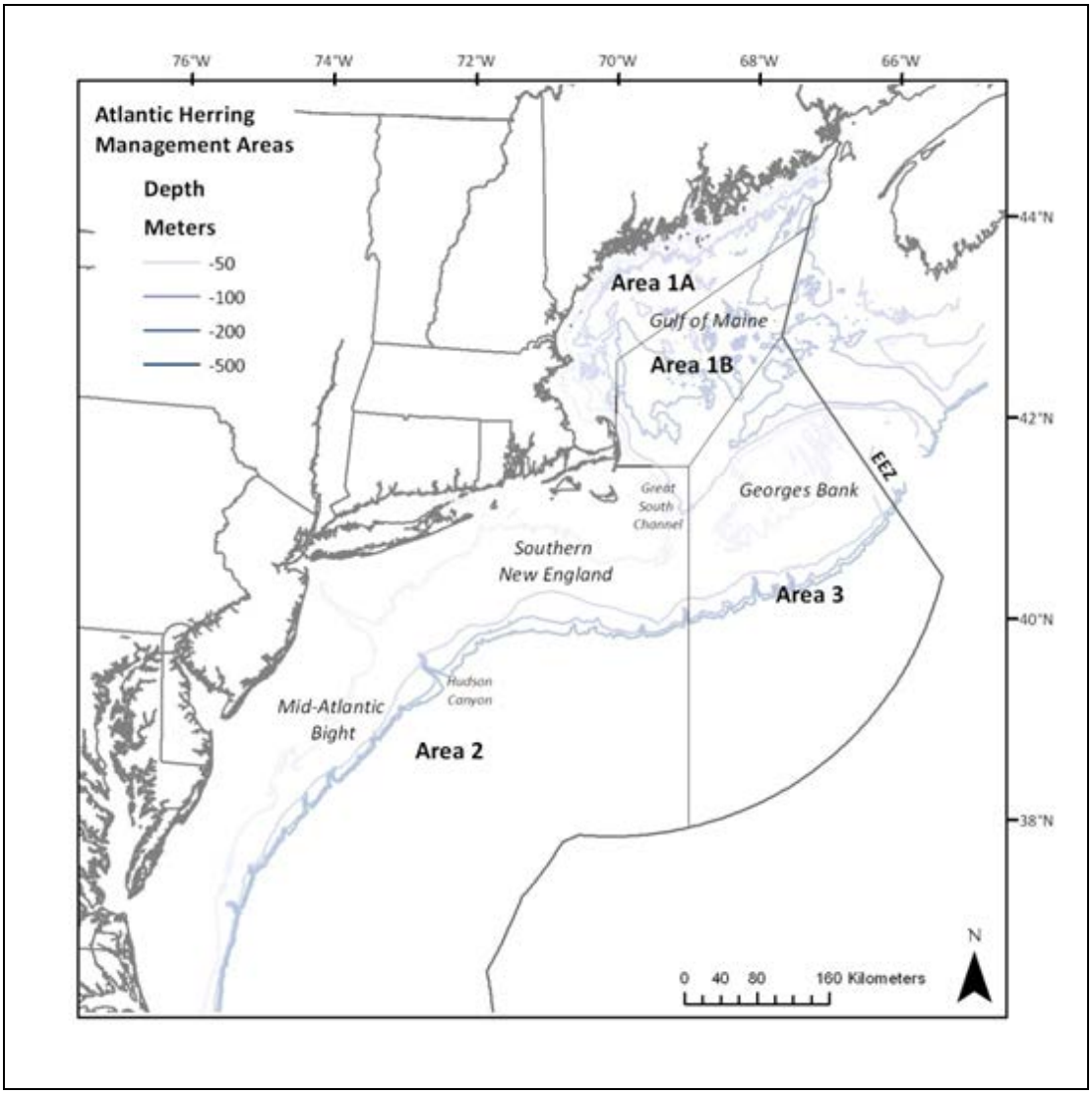
Note the fishing mortality and comparisons between GARM III and groundfish updates, which were provided during peer-review.

5.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

5.3.1 Physical Environment

The Atlantic herring fishery is prosecuted in four areas defined as 1A, 1B, 2, and 3 (Figure 64). 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, are described below, 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 64 Atlantic Herring Management Areas and the Northeast U.S. Shelf Ecosystem



5.3.1.1 Gulf of Maine

The Gulf of Maine is an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank. The Gulf of Maine is a boreal environment and is characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface.

Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel, sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a depth of about 60 m. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 20 to 40 m, except off eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

The geologic features of the Gulf of Maine coupled with the vertical variation in water properties (e.g. salinity, depth, temperature) combine to provide a great diversity of habitat types that support a rich biological community. The most common groups of benthic invertebrates in the Gulf of Maine reported by Theroux and Wigley (1998) in terms of numbers collected were annelid worms, bivalve mollusks, and amphipod crustaceans. Biomass was dominated by bivalves, sea cucumbers, sand dollars, annelids, and sea anemones. Watling (1998) identified seven different bottom assemblages that occur on the following habitat types:

- Sandy offshore banks: fauna are characteristically sand dwellers with an abundant interstitial component;
- Rocky offshore ledges: fauna are predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers;
- Shallow (< 60 m) temperate bottoms with mixed substrate: fauna population is rich and diverse, primarily comprised of polychaetes and crustaceans;
- Primarily fine muds at depths of 60 to 140 m within cold Gulf of Maine Intermediate Water: fauna are dominated by polychaetes, shrimp, and cerianthid anemones;
- Cold deep water, muddy bottom: fauna include species with wide temperature tolerances which are sparsely distributed, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present;
- Deep basin, muddy bottom, overlaying water usually 7 to 8°C: fauna densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipods; and
- Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always greater than 8°C: upper slope fauna extending into the Northeast Channel, where Maine Intermediate Water is described as a mid-depth layer of water that preserves winter salinity and temperatures, and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western Gulf of Maine.

Two studies (Gabriel 1992, Overholtz and Tyler 1985) reported common demersal fish species by assemblages in the Gulf of Maine and Georges Bank (other species were listed as found in these assemblages, but only the species common to both studies are listed):

- Deepwater/Slope and Canyon: offshore hake, blackbelly rosefish, Gulf stream flounder;
- Intermediate/Combination of Deepwater Gulf of Maine-Georges Bank and Gulf of Maine-Georges Bank Transition: silver hake, red hake, goosefish (monkfish);
- Shallow/Gulf of Maine-Georges Bank Transition Zone: Atlantic Cod, haddock, pollock;
- Shallow water Georges Bank-southern New England: yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin;
- Deepwater Gulf of Maine-Georges Bank: white hake, American plaice, witch flounder, thorny skate; and
- Northeast Peak/Gulf of Maine-Georges Bank Transition: Atlantic cod, haddock, pollock.

5.3.1.2 Georges Bank

Georges Bank is a shallow (3 to 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed during the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank and has steep submarine canyons on its eastern and southeastern edges. It is characterized by highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents reduces the amount of sand and cause an overall coarsening of the bottom sediments (Valentine and Lough 1991).

Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping seafloor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin. The central region of Georges Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed within. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of Georges Bank. Currents in these areas are strongest where water depth is shallower than 50 m. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm-generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity.

Oceanographic frontal systems separate water masses of the Gulf of Maine and Georges Bank from oceanic waters south of Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution.

Georges Bank has been historically characterized by high levels of both primary productivity and fish production. The most common groups of benthic invertebrates on Georges Bank in terms of numbers collected were amphipod crustaceans and annelid worms, and overall biomass was dominated by sand dollars and bivalves (Theroux and Wigley 1998). Using the same database, four macrobenthic invertebrate assemblages that occur on similar habitat type were identified (Theroux and Grosslein 1987):

- The Western Basin assemblage is found in comparatively deepwater (150 to 200 m) with relatively slow currents and fine bottom sediments of silt, clay, and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers.
- The Northeast Peak assemblage is found in variable depth and current strength and includes coarse sediments, consisting mainly of gravel and coarse sand with interspersed boulders, cobbles, and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittle stars, crustaceans, and polychaetes), with a characteristic absence of burrowing forms.
- The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths less than 100 m. Medium-grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large with burrowing or motile habits. Sand dollars are most characteristic of this assemblage.
- The Southern Georges Bank assemblage is found on the southern and southwestern flanks at depths from 80 to 200 m, where fine-grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids, and starfish.

Common demersal fish species found on Georges Bank are offshore hake, blackbelly rosefish, Gulf stream flounder, silver hake, red hake, goosefish (monkfish), Atlantic cod, haddock, pollock, yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin, white hake, American plaice, witch flounder, and thorny skate.

5.3.1.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream. The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England and generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 to 200 m water depth) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson et al. 2004). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations during past ice ages. Since that time, currents and waves have modified this basic structure.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. On the slope, silty sand, silt, and clay predominate. Permanent sand ridges occur in groups with heights of about 10 m, lengths of 10 to 50 km and spacing of 2 km. The sand ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Sand waves are usually found in patches of 5 to 10 with heights of about 2 m, lengths of 50 to 100 m, and 1 to 2 km between patches. The sand waves are usually found on the inner shelf and are temporary features that form and re-form in different locations, especially in areas like Nantucket Shoals where there are strong bottom currents. Because tidal currents southwest of Nantucket Shoals and southeast of Long Island and Rhode Island slow significantly, there is a large mud patch on the seafloor where silts and clays settle out.

Artificial reefs are another significant Mid-Atlantic Bight habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). In general, reefs are important for attachment sites, shelter, and food for many species. In addition, fish predators, such as tunas, may be attracted by prey aggregations or may be behaviorally attracted to the reef structure. Estuarine reefs, such as blue mussel beds or oyster reefs, are dominated by epibenthic organisms, as well as crabs, lobsters, and sea stars. These reefs are hosts to a multitude of fish, including gobies, spot, bass (black sea and striped), perch, toadfish, and croaker. Coastal reefs are comprised of either exposed rock, wrecks, kelp, or other hard material, and these are generally dominated by boring mollusks, algae, sponges, anemones, hydroids, and coral. These reef types also host lobsters, crabs, sea stars, and urchins, as well as a multitude of fish, including black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black grouper, smooth dogfish, and summer flounder. These epibenthic organisms and fish assemblages are similar to the reefs farther offshore, which are generally comprised of rocks and boulders, wrecks, and other types of artificial reefs. There is less information available for reefs on the outer shelf, but the fish species associated with these reefs include tilefish, white hake, and conger eel.

The benthic inhabitants of this primarily sandy environment are dominated in terms of numbers by amphipod crustaceans and bivalve mollusks. Biomass is dominated by mollusks (70 percent) (Theroux and Wigley 1998). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

- The “sand fauna” zone is dominated by polycheates and was defined for sandy sediments (1 percent or less silt) that are at least occasionally disturbed by waves, from shore out to a depth of about 50 m.
- The “silty sand fauna” zone is dominated by amphipods and polychaetes and occurs immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material.
- Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley supporting the “silt-clay fauna.”

Rather than substrate as in the Gulf of Maine and Georges Bank, latitude and water depth are considered to be the primary factors influencing demersal fish species distribution in the Mid-Atlantic Bight area. The following assemblages were identified by Colvocoresses and Musick (1984) in the Mid-Atlantic subregion during spring and fall (Other species were listed as found in these assemblages, but only the species common to both spring and fall seasons are listed).

- Northern (boreal) portions: hake (white, silver, red), goosefish (monkfish), longhorn sculpin, winter flounder, little skate, and spiny dogfish;
- Warm temperate portions: black sea bass, summer flounder, butterfish, scup, spotted hake, and northern sea robin;
- Water of the inner shelf: windowpane flounder;
- Water of the outer shelf: fourspot flounder; and
- Water of the continental slope: shortnose greeneye, offshore hake, blackbelly rosefish, and white hake.

5.3.2 Essential Fish Habitat (EFH)

EFH is defined by the Sustainable Fisheries Act of 1996 as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The following sections describe Atlantic herring EFH, EFH designations for other species that overlap with the herring fishery, herring as a prey species, and finally, herring gear and its potential to generate adverse effects on benthic EFH.

5.3.2.1 Atlantic Herring EFH

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 65 through Figure 68 and in Table 37 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 65. 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 66. 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 67. 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 68. 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 68. 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 37, according to life history stage. The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

Table 37 – 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 65 – EFH Designation for Atlantic Herring Eggs

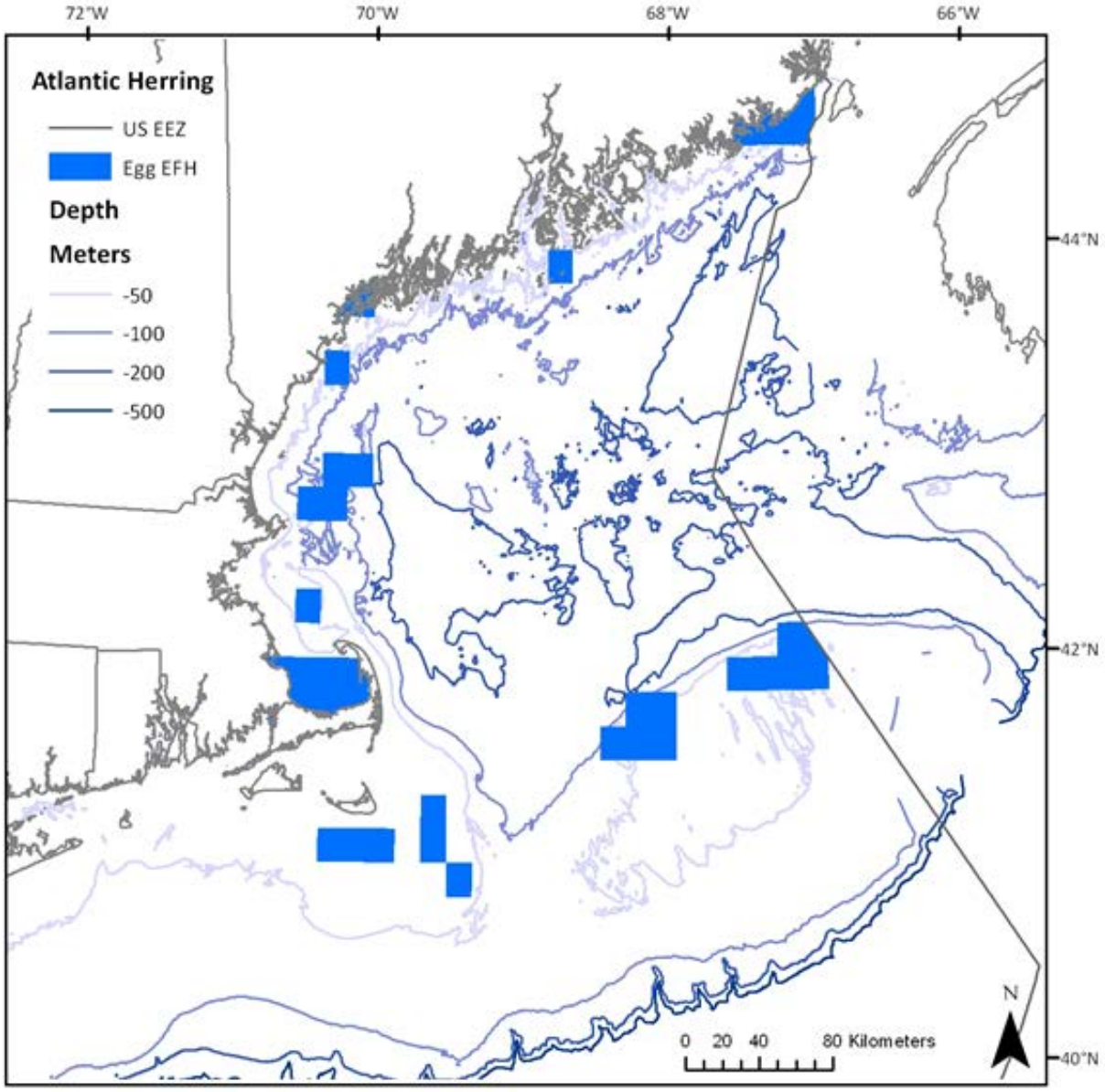


Figure 66 – EFH Designation for Atlantic Herring Larvae

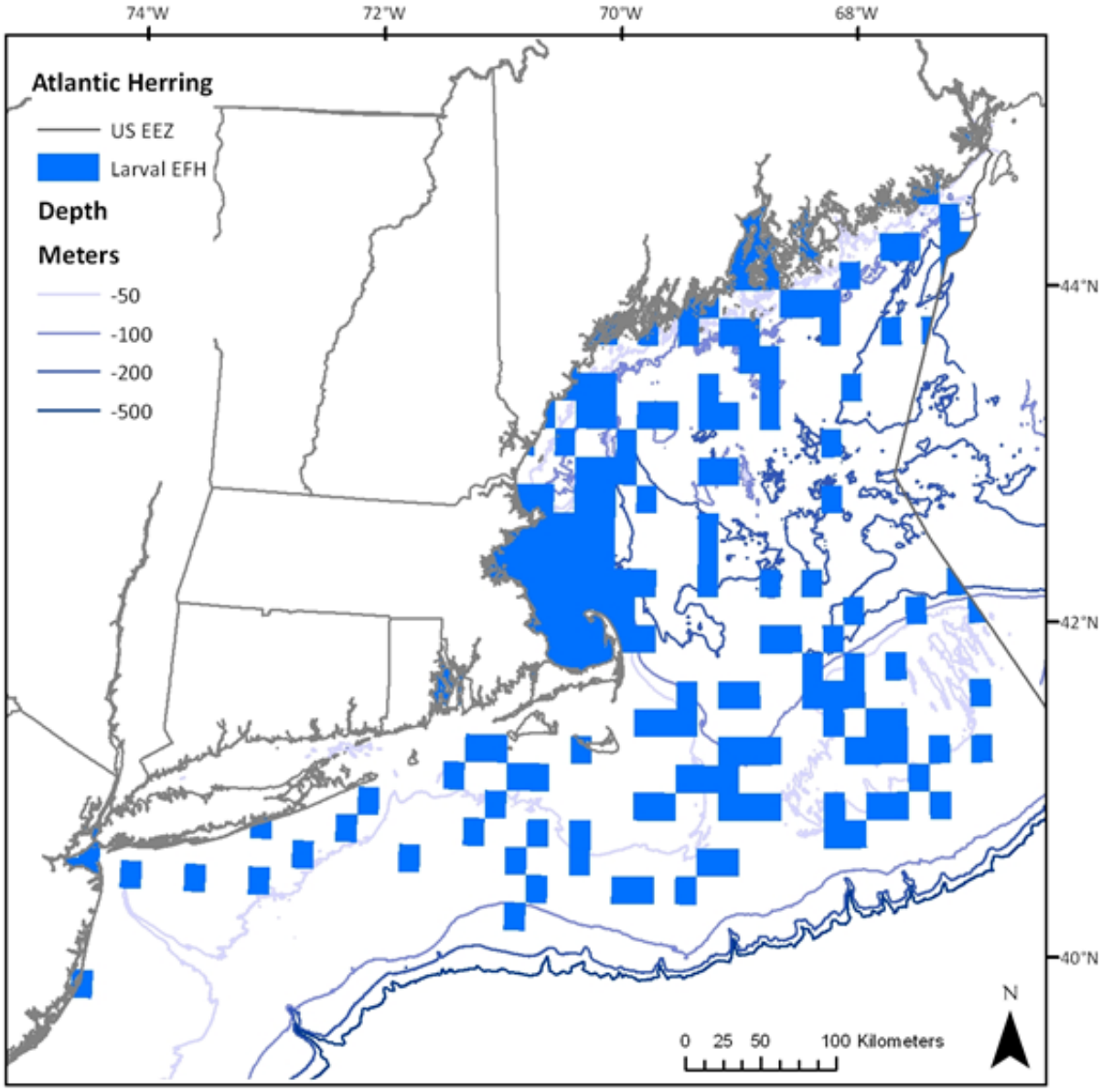


Figure 67 – EFH Designation for Atlantic Herring Juveniles

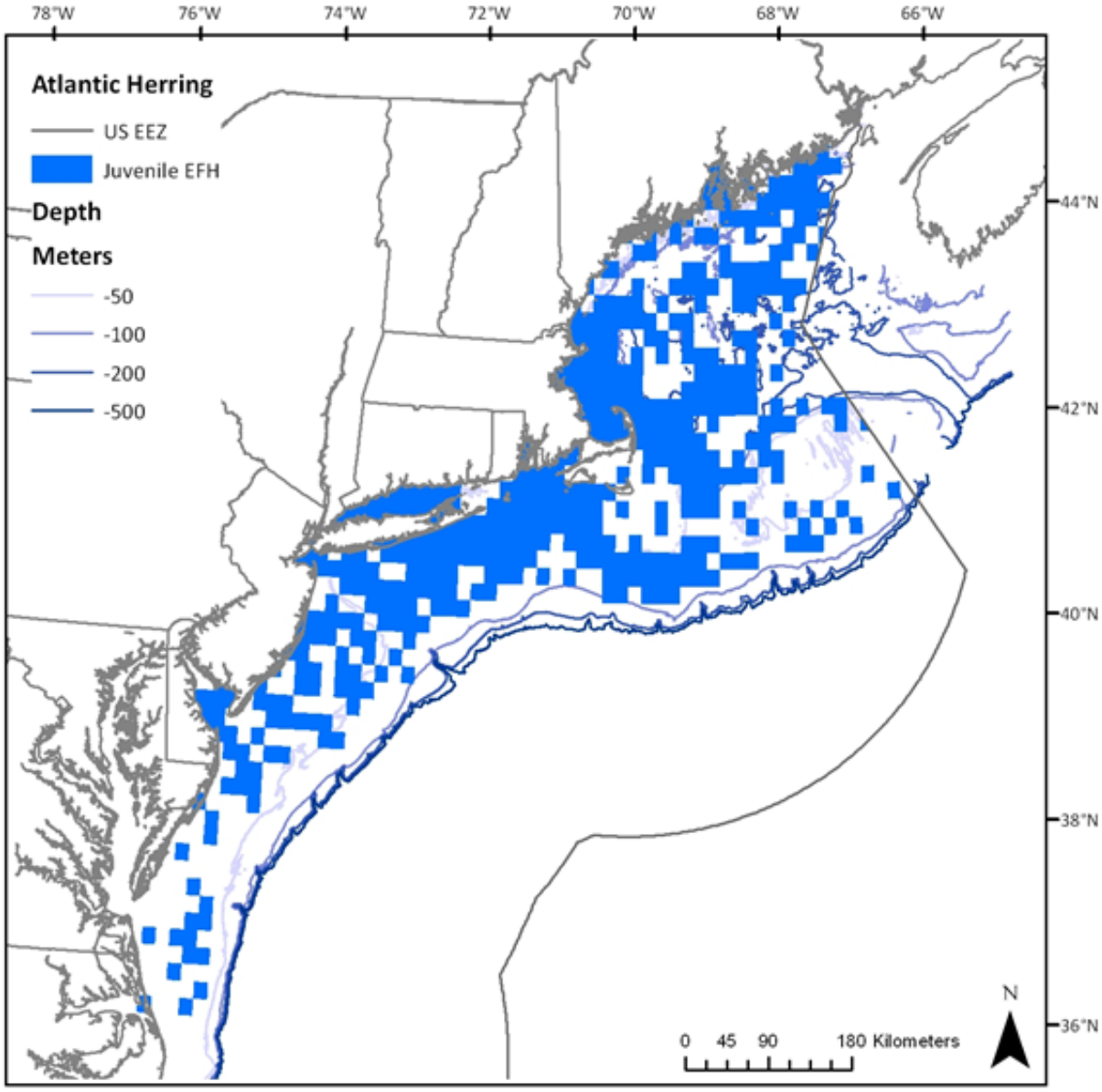
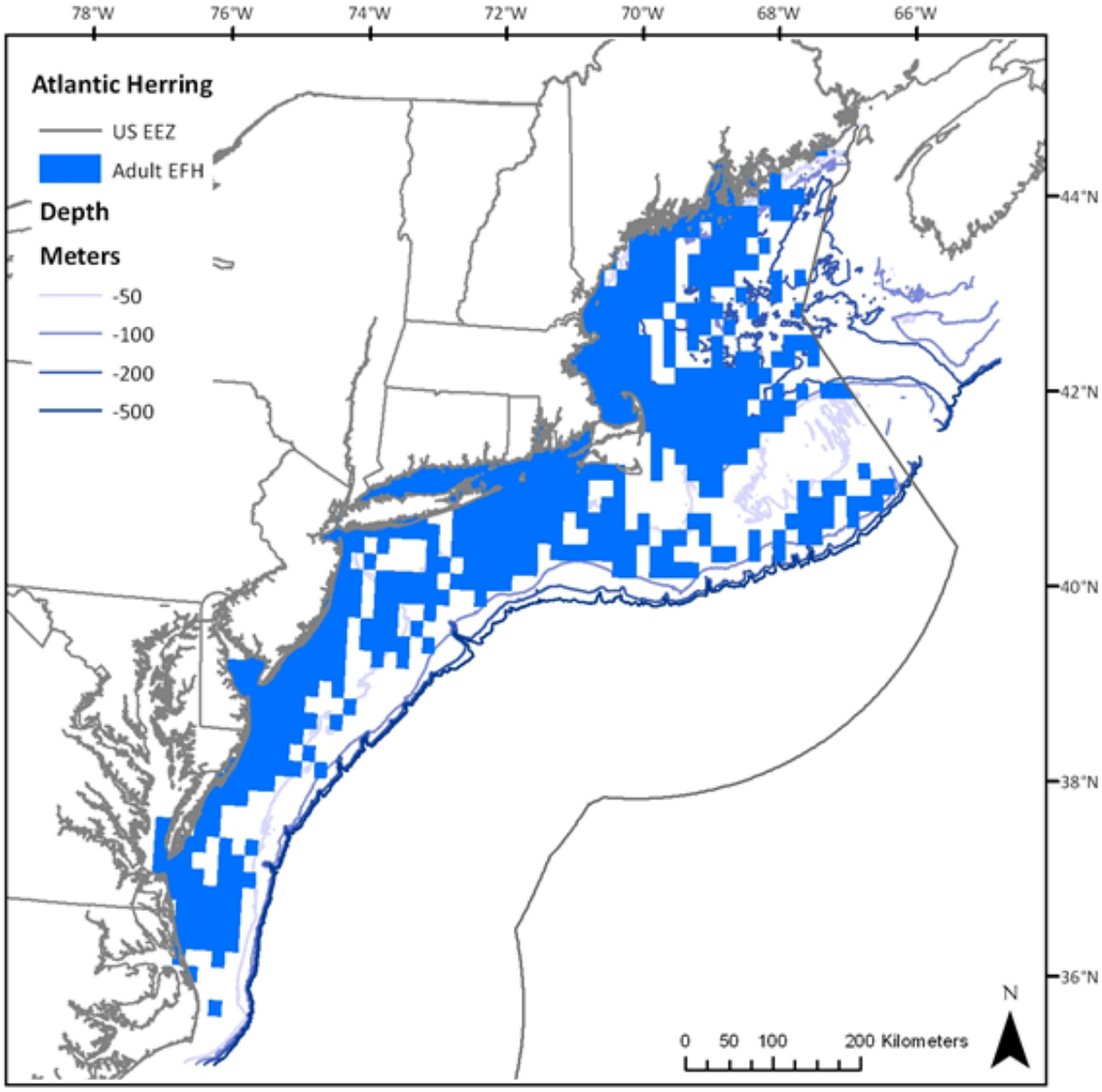


Figure 68 – EFH Designation for Atlantic Herring Adults



EFH for Other Species

The environment that could potentially be affected by the Proposed Action has been identified as EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; Atlantic sea scallop; monkfish; deep-sea red crab; northeast skate complex; Atlantic herring; summer flounder, scup, and black sea bass; tilefish; squid, Atlantic mackerel, and butterfish; Atlantic surfclam and ocean quahog FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs are summarized in Table 38. Full descriptions and maps of EFH for each species and life stage (except Atlantic wolffish) are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.htm.

Table 38 – Demersal Species/Lifestages for Which Designated EFH Overlaps with the Atlantic Herring Fishery, Listed Alphabetically by Common Name

Species	*Life Stage*	*Geographic Area of EFH*	*Depth*	*Seasonal Occurrence*	*EFH Description*
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOME, GB	100 - 700		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 – 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s

Table 38 continued.

Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mosty < 150		Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mosty < 150		Bottom habitats with mud, gravel, and sand substrates
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 – 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom

Table 38 continued.

Golden crab	juvenile	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Monkfish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Monkfish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats withsubstrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Ocean quahog	juvenile	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245		Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras

Table 38 continued.

Ocean quahog	adult	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Spawn May to December with several peaks	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Offshore hake	juvenile	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170 - 350		Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380		Bottom habitats
Pollock	juvenile	GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 – 250		Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 – 365		Hard bottom habitats including artificial reefs
Red crab	juvenile	Southern flank of GB and south the Cape Hatteras, NC	700 - 1800		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Red crab	adult	Southern flank of GB and south the Cape Hatteras, NC	200 - 1300		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud

Table 38 continued.

Redfish	juvenile	GOME, southern edge of GB	25 - 400		Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOME, southern edge of GB	50 - 350		Bottom habitats with a substrate of silt, mud, or hard bottom
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 -185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 – 270		Bottom habitats of all substrate types
Silver hake	adult	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30 – 325		Bottom habitats of all substrate types
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward

Table 38 continued.

Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spiny dogfish	juvenile	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 390		Continental shelf waters and estuaries
Spiny dogfish	adult	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 450		Continental shelf waters and estuaries
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includesestuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Tilefish	Juveniles and adults	Shelf break, submarine canyon walls, and flanks from Georges Bank to Cape Hatteras	Bottom temps between 9-14° C (generally 100-300 m)		Cohesive clay sediments for burrowing; rocks, boulders, and clay ledges
White hake	adult	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 325		Bottom habitats with substrate of mud or fine grained sand
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand

Table 38 continued.

Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 37, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Witch flounder	juvenile	GOME, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500		Bottom habitats with fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300		Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud

Table 39 – Listing of Sources for current EFH Designation Information*

Species	*Management authority*	*Plan managed under*	*EFH designation action*
American plaice	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic cod	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic halibut	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic herring	NEFMC	Atlantic Herring	EFH Omnibus/Atlantic Herring FMP
Atlantic salmon	NEFMC	Atlantic salmon	EFH Omnibus/Atlantic Salmon FMP
Atlantic sea scallop	NEFMC	Atlantic Sea Scallop	EFH Omnibus/Atlantic Sea Scallop A9
Atlantic surfclam	MAFMC	Atlantic Surfclam Ocean Quahog	Atlantic Surfclam Ocean Quahog A12
Atlantic wolffish	NEFMC	NE Multispecies	Amendment 16
Barndoor skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Black sea bass	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12
Clearnose skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Golden crab	SAFMC	Golden Crab	Golden Crab FMP A1
Haddock	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Little skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Monkfish	NEFMC, MAFMC	Monkfish	EFH Omnibus/Monkfish A1
Ocean pout	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Ocean quahog	MAFMC	Atlantic Surfclam Ocean Quahog	Atlantic Surfclam Ocean Quahog A12
Offshore hake	NEFMC	NE Multispecies	NE Multispecies A12
Pollock	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Red crab	NEFMC	Red Crab	Original Red Crab FMP
Red drum	ASMFC/SAFMC	ASMFC Red Drum FMP	SAFMC Habitat Plan
Red hake	NEFMC	NE Multispecies	NE Multispecies A12
Redfish	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Rosette skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Scup	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12
Silver hake	NEFMC	NE Multispecies	NE Multispecies A12
Smooth skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Spanish mackerel, cobia, and king mackerel	SAFMC/GMFMC	Coastal Migratory Pelagics	Coastal Migratory Pelagics FMP A10
Spiny dogfish	MAFMC/NEFMC	Spiny Dogfish	Original Spiny Dogfish FMP
Summer flounder	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12
Thorny skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Tilefish	MAFMC	Tilefish	Tilefish FMP Amendment 1
White hake	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Windowpane flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Winter flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Winter skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Witch flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Yellowtail flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11

*Current as of May 2011

5.3.2.2 Herring Gear Types and Their Interaction with Habitat

Usage of different gear types to prosecute the herring fishery has shifted over time: fixed gear dominated the fishery in the 1960s, purse seines became the dominant gear type in the 1980s and early 1990s, and since the mid-1990s, the fishery is prosecuted primarily by midwater trawl (single and paired) vessels. All offshore directed fishing for herring (Area 3) occurs through the use of midwater trawls and pair trawls. The use of purse seine gear in the fishery in the inshore Gulf of Maine has increased since the 2007 implementation of the Area 1A seasonal purse seine/fixed gear only area, as a few vessels are converting to purse seine gear to prosecute the summer fishery. The increased use of small mesh bottom trawl gear in the Atlantic herring fishery in recent years is discussed in Section 5.5.1 of this document.

The purse seine is a deep nylon mesh net with floats on the top and lead weights on the bottom. Rings are fastened at intervals to the lead line and a purse line runs completely around the net through the rings (see GMRI web site www.gmri.org). One end of the net remains in the vessel and the other end is attached to a power skiff or "bug boat" that is deployed from the stern of the vessel and remains in place while the vessel encircles a school of fish with the net. Then the net is pursed and brought back aboard the vessel through a hydraulic power block. Purse seines vary in size according to the size of the vessel and the depth to be fished. Most purse seines used in the New England herring fishery range from 30 to 50 meters deep (100-165 ft) (NMFS 2005). Purse seining is a year round pursuit in the Gulf of Maine, but is most active in the summer when herring are more abundant in coastal waters. Purse seines are mostly utilized at night, when herring are feeding near the surface. This fishing technique is less successful when fish remain in deeper water and when they do not form "tight" schools.

Weir and stop seining are traditional fishing techniques associated with the tending of inshore coves in Maine (NEFMC 1999). They are the principal gears used in the inshore herring fishery along the Maine coast. These fishing gear types occur entirely within State waters, and therefore are not regulated under a Federal FMP.

Midwater trawls are used to capture pelagic species throughout the water column between the surface and the seabed. Midwater trawls used in the New England Atlantic herring fishery are generally nylon rope trawls with very large meshes in the forward portion of the net that become progressively smaller toward the rear of the net, sometimes called the "brailer." For nets used on single boats, the net is spread horizontally with two large metal doors positioned in front of the net. As the trawler moves forward, the doors, and therefore the net, are forced outward. Once the net is deployed, changes in its position in the water column (height above the bottom) are made by increasing or decreasing the speed of the vessel or by bringing or letting out trawl wire. An electronic sonar system mounted in the mouth of the net allows the fisherman to continually monitor the size of the net opening and the height of the net above the bottom during each tow. The footrope of the net is usually weighted with short lengths of chain in order to keep the mouth of the net open. In most cases, two heavy weights are attached forward of the net to cables that extend from the net opening to the trawl doors, and there is no ground gear (e.g., "cookies") attached to the footrope. Tows typically last for several hours, and catches are large. The fish are usually removed from the net while it remains in the water alongside the vessel by means of a pump. Only larger fish (bycatch or incidental catch) are sorted by the crew as the fish are pumped into the vessel holds.

"Pair trawls" used in the New England Atlantic herring fishery are designed identically as single boat midwater trawls, but do not have doors, since the net is spread by the two vessels. The nets are often larger than single-boat midwater trawls because the combined towing power of two vessels exceeds that of a single vessel.

The current regulatory definition of midwater trawl gear is: *Midwater trawl gear means trawl gear that is designed to fish for, is capable of fishing for, or is being used to fish for pelagic species, no portion of which is designed to be or is operated in contact with the bottom at any time. The gear may not include discs, bobbins, or rollers on its footrope, or chafing gear as part of the net.*

Herring midwater trawls are not designed to fish on the bottom and do not normally contact the bottom, although information provided by herring fishermen indicates that the footrope, the belly of the net, and/or the weights do occasionally contact the bottom. Sometimes, when herring are in deep water near the bottom, midwater trawls are intentionally fished close to or in contact with the bottom. This occurs primarily in southern New England and the Mid-Atlantic during the winter (January-March); it may also occur in certain places on Georges Bank. The use of midwater trawls near or on the bottom generally only occurs on smooth mud and sand substrate, since bottom contact in more complex, rocky habitats (which are more common in the Gulf of Maine) causes the footrope to "hang up" and causes serious damage to the net. Damaged nets require costly repairs, and that provides an incentive to fishermen to avoid bottom contact. The trawl doors do not contact the bottom. Because the herring in the rear of the net remain alive during the tow, even when it is full of herring, the brailer normally floats free of the seafloor when fishing near the bottom.

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

The impacts of the management measures under consideration in Amendment 5 on the physical environment and EFH are evaluated throughout this document and discussed in Section 6.0. The following information provides some perspective on "baseline" conditions for the physical environment and EFH, including characterization of the effects of the herring fishery on habitat. This information is important to consider as a baseline for evaluating the potential impacts of additional management measures or regulatory changes in the fishery.

Since 1996, the MSA has included a requirement to evaluate the potential adverse effects of fisheries, including the Atlantic herring fishery, on EFH for the species managed by the FMP (in this case, herring) and on the EFH of other species. The EFH final rule specifies that measures to minimize adverse effects should be enacted when these effects are estimated to be 'more than minimal' and 'not temporary in nature'.

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

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

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

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

5.4 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 40, 13 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA; the remaining species in Table 40 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.

5.4.1 Species Present in the Area

Table 40 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 40 also includes three candidate fish species and one proposed fish species (species being considered for listing as an endangered or threatened species), as identified under the ESA.

Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register. Cusk, alewife, and blueback herring are known to occur within the action area of the herring fishery. Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends considering conservation actions to limit the potential for adverse effects on candidate species. The Protected Resources Division of the NMFS Northeast Regional Office has initiated review of recent stock assessments, bycatch information, and other information for these candidate species which will be incorporated in the status review reports. Additional information about river herring (alewife and blueback) is provided below.

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

The Atlantic States Marine Fisheries Commission (ASMFC) completed a stock assessment for river herring in May 2012, which they had been conducting since 2008, covering over 50 river specific stocks throughout the species U.S. range. This represented a significant effort on behalf of the ASMFC and the coastal states from Maine to Florida. NMFS recognized this extensive effort to compile the most current information on the status of these stocks throughout their range in the United States and, in order to not duplicate this effort, has been working cooperatively with ASMFC. NMFS will utilize the information from the stock assessment as a critical component in the ESA listing decision for these two species. Due to the nature of the stock assessment, it did not contain all elements necessary for making a listing

determination under the ESA; therefore, NMFS identified the additional required elements and held workshops focused on addressing this information. The three workshops organized for this purpose addressed river herring stock structure, extinction risk analysis (ERA), and climate change. Reports from the stock structure and ERA workshop and working group meeting were compiled and are being independently peer reviewed by the Center for Independent Experts, and the report from the climate change workshop has been compiled and is also being reviewed. The peer review reports and additional climate change analysis and extinction risk modeling results will be available in September/October, 2012. NMFS will use these reports and the modeling results along with the ASMFC river herring stock assessment and all other best available information to develop a listing determination which will be published in the *Federal Register* as soon as possible.

Table 40 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.

5.4.2 Species Potentially Affected

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

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

5.4.2.1 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).

5.4.2.2 Large Cetaceans

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

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

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

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

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

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

5.4.2.3 Small Cetaceans

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

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

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

New England

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

Mid-Atlantic

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

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

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

5.4.2.4 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).

5.4.2.5 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). As noted in Section 7.4.1, 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.

5.4.2.6 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.

5.4.3 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 41 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 41 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 42 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 midwater 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 midwater trawl (including pair trawl)	887	Harbor seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
Tier 2 Category II	Gulf of Maine Atlantic herring purse seine	>6	Harbor seal, WNA Gray Seal, WNA
Tier 2, Category III	Gulf of Maine herring and Atlantic mackerel stop seine/weir	Unknown	Gray seal, Northwest North Atlantic Harbor porpoise, GME/BF Harbor seal, WNA Minke whale, Canadian East Coast White-sided dolphin, WNA

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

Given the target species of this fishery and because herring is a primary prey species for seals, porpoises and some whales, levels of protected species interactions with the fishery are likely for the midwater and pair trawl. The NOAA Fisheries Northeast Fisheries Science Center incidental take reports are published on the Northeast Fisheries Science Center website -http://www.nefsc.noaa.gov/femad/fishsamp/fsb/. A number of takes have occurred in the past four years by the midwater trawl fishery, as indicated in Table 43.

Table 43 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.

5.4.4 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.

5.5 FISHERY-RELATED BUSINESSES AND COMMUNITIES

5.5.1 Fishery-Related Businesses

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

5.5.1.1 Atlantic Herring Catch – VTR, IVR, VMS

5.5.1.1.1 Herring Landings (VTR)

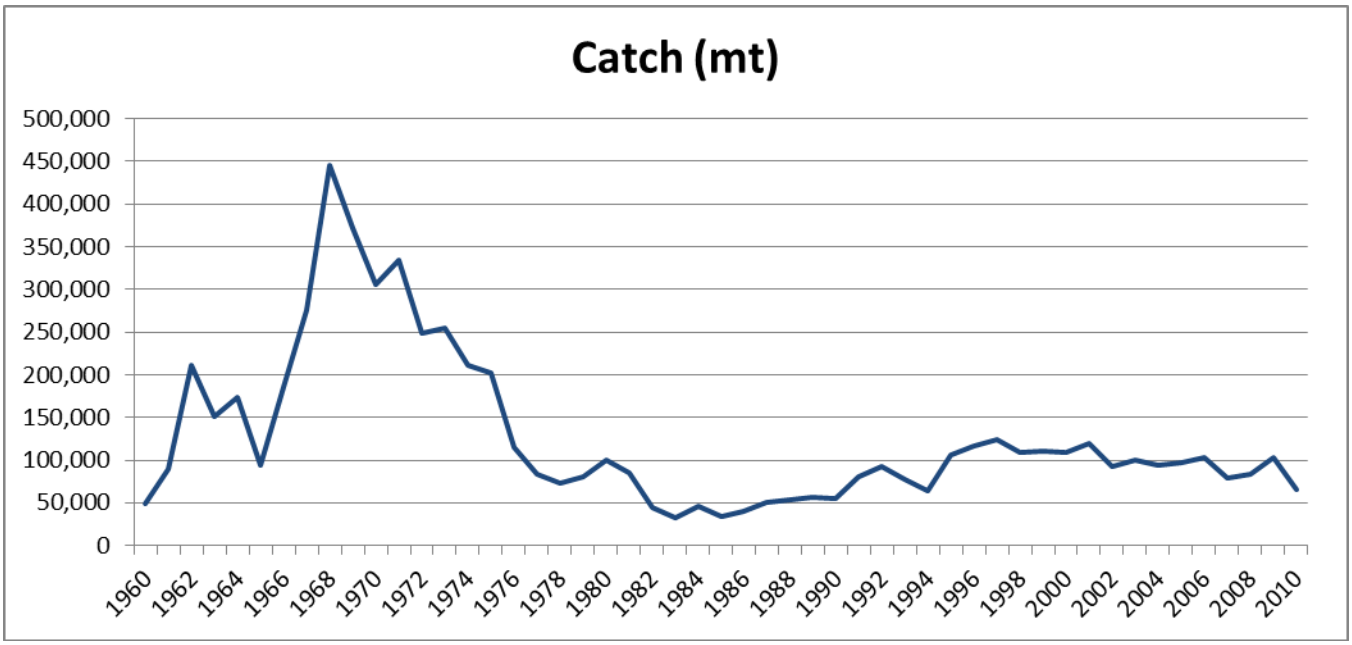
Table 44 provides a historical time series of reported Atlantic herring landings and has been updated from Amendment 1 through 2010 to include VTR data for the most recent years in the table. From 2007 to 2009 the average landings were 88,351 mt; landings increased during this time period. From 2009 to 2010, however, there was a 36% decrease in the landings, due to a concurrent decrease in the stockwide ACL to 91,000 mt. The landings in 2010 are the lowest on record since 1994, when VTR-reporting began. Information in 1994 is likely not complete due to the beginning of the reporting requirement, however. The extended time series of herring VTR data are also graphically represented in Figure 69.

Table 44 Total Landings (Metric Tons) of Atlantic Herring from VTR Data, 1960-2010

Year	Catch (mt)	Year	Catch (mt)
1960	49,320	**1986**	40,219
1961	89,634	**1987**	49,957
1962	210,924	**1988**	53,617
1963	151,440	**1989**	55,842
1964	173,639	**1990**	55,406
1965	94,600	**1991**	80,165
1966	185,200	**1992**	92,749
1967	275,764	**1993**	76,880
1968	445,656	**1994**	63,701
1969	371,155	**1995**	106,185
1970	306,423	**1996**	117,275
1971	333,692	**1997**	123,845
1972	248,526	**1998**	108,428
1973	254,500	**1999**	110,800
1974	210,502	**2000**	108,818
1975	202,643	**2001**	120,025
1976	115,338	**2002**	93,157
1977	83,612	**2003**	100,836
1978	72,732	**2004**	95,069
1979	81,048	**2005**	97,222
1980	99,445	**2006**	102,820
1981	85,622	**2007**	78,765
1982	44,448	**2008**	83,384
1983	33,230	**2009**	102,905
1984	46,660	**2010**	66,198
1985	33,352		

Source: NMFS VTR databases, May 2011

Figure 69 Total Landings (Metric Tons) of Atlantic Herring from VTR Data, 1960-2010



Source: NMFS VTR database, May 2011

5.5.1.1.2 Herring Catch Monitoring (Sub-ACLs) – IVR and VMS Data

Until very recently (described below), catch limits for the Atlantic herring fishery were monitored using data provided by federally-permitted fishing vessels weekly through an interactive voice response (IVR) system and supplemented by other data sources where IVR data are not available. IVR data were compared to federal and state dealer data each week and dealer reports are used to supplement the IVR when necessary. These supplements include data from non-federally permitted inshore fisheries when provided by state agencies or from other sources. Although vessels are also required to report catches with vessel trip report (VTR) forms, near real-time data was obtained through the IVR system allowing the sub-ACLs to be monitored. Regulations specified that the owner or operator of any vessel issued a limited access Atlantic herring permit (Category A, B, C) must submit an Atlantic herring catch report via the IVR system each week, regardless of how much herring is caught (including weeks when no herring is caught), unless exempted from this requirement by the Regional Administrator. In addition, the owner or operator of any vessel issued an open access permit for Atlantic herring that catches 2,000 pounds of Atlantic herring on any trip in a week was required to submit an Atlantic herring catch report via the IVR system for that week as required by the Regional Administrator.

The IVR system required vessel owners/operators to submit herring catch reports through the IVR system even during weeks when the vessel may not have fished and/or may not have caught any herring. These are considered "negative reports," i.e., reports of zero catch. Negative IVR reports ensure that catch data are more complete and affirm an action relative to vessels' fishing activity during any given week. Negative reports help to resolve potential problems with "missing" data; for example, if a vessel has been submitting herring catch reports through the IVR system and does not fish or catch herring for several weeks, the negative reports allow database managers to know that the vessel did not fish or catch herring during those weeks, versus making assumptions about the vessel's fishing activity and/or applying a proxy level of catch for the vessel's missing reports. Data gaps must be addressed in a timely fashion in order to use the IVR system for real-time quota monitoring, so if negative reports are not filed, it is less

clear whether the available data accurately characterize catch in the fishery for quota monitoring purposes.

The Atlantic herring fishery specifications process was revised in Amendment 4 to meet the new requirements of the MSA, including the specification of an overfishing level and standards for setting annual catch limits that consider both scientific and management uncertainty. The 2010-2012 specifications included substantial reductions in the available yield and management area sub-ACLs across the herring fishery. Through the new specifications process, optimum yield (OY) for the herring fishery was reduced from 145,000 mt to 91,200 mt (Table 45). All management area sub-ACLs consequently decreased, and the Area 1A sub-ACL was reduced by 41% from 45,000 metric tons in 2009 to 26,546 metric tons for 2010-2012. The Area 1B sub-ACL was reduced by more than 50%. The specifications process includes an accountability measure that requires the directed herring fishery be closed in any management area when 95% of the sub-ACL is projected to be reached. Another accountability measure requires overage deductions once final catches are tallied (see additional discussion below).

Table 45 2010-2012 Atlantic Herring Fishery Specifications (Metric Tons)

SPECIFICATION	2010-2012 ALLOCATION (MT)	Previous (2009) Allocation
OFL	**145,000 (2010)** **134,000 (2011)** **127,000 (2012)**	N/A
ABC	**106,000**	194,000
Stock-wide ACL/U.S. OY	**91,200**	145,000
Sub-ACL Area 1A	**26,546**	45,000
Sub-ACL Area 1B	**4,362**	10,000
Sub-ACL Area 2	**22,146**	30,000
Sub-ACL Area 3	**38,146**	60,000

**In response to the need to track catch against sub-ACLs on a more real-time basis, NMFS issued rulemaking in September 2011 to eliminate IVR reporting for limited access herring vessels and require daily VMS catch reporting. The new requirements are described in the "no action" options for the catch monitoring program and are summarized below, and the new methodology for tracking catch and monitoring sub-ACLs is described below.*

Atlantic Herring Catch Estimates

Table 46 summarizes the Atlantic herring catch estimates by year and management area that were utilized by NMFS for quota/sub-ACL monitoring from 2003-2012. The following describes how catch and/or landings 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. During 2008 and 2009, TACs for Areas 1A and 1B were reduced for a research set-aside. The RSA for Area 1A was 1,350 mt, and the RSA for Area 1B was 300 mt.

- 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 provided in the following sub-section). In general, the year-end methodology for estimating total 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 (daily VMS catch reports and VTR reports, supplemented with state/federal dealer data). Reported herring discards are included in the totals.

Table 46 Atlantic Herring Catch by Year and Management Area, 2003-2012

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

Source: NMFS.

Note the shaded rows indicate overages.

**2012 data are preliminary based on NMFS' in-season quota monitoring.*

5.5.1.1.2.1 NMFS' Year-End Catch Estimation – Methodology

A change to year-end tallying 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.

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.

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 47). Thus, this is not considered problematic to the 2013-2015 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 (refer to section 6.3.6):

(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 47 illustrates that the "Discards as % of Total Catch" were minimal in 2010 and 2011.

Table 47 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.

5.5.1.1.2.2 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 46). 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 48, 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 48). 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 (see Table 48). When the 2013 specifications are finalized, then the 1,425 mt overage will be deducted from the final 2013 Area 1A sub-ACL.

Additionally, the herring catch seen in the preliminary 2012 totals in Table 48 suggests that there are overages for Areas 1B, 2, and 3. As a result, the indicated sub-ACL overages also suggest that there is a total ACL overage for the 2012 fishing year, (currently the only year with a suggested total ACL overage). The resulting 2014 sub-ACLs are to be determined.

Table 48 Atlantic Herring Catch – 2011 and 2012 Overages and Resulting 2013 and 2014 Sub-ACLs

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

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

5.5.1.2 Vessels and Crew

Amendment 1 to the Herring FMP established a limited access program in the 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). Category A and B vessels comprise the majority of the directed Atlantic herring fishery. Many of the Category A, B, and C vessels are also active in the Atlantic mackerel fishery (managed by the MAFMC).

Table 49 summarizes the number of federally permitted Atlantic herring vessels by Amendment 1 permit category and length. There were 101 vessels with limited access permits during the 2010 fishing year. The majority of participants in the directed Atlantic herring fishery are Category A and B vessels. There was a reduction of three vessels (from 49 to 46) in the limited access directed fishery (Categories A and B) in 2010 from the previous year, possibly due to substantial cuts in herring catch limits in the 2010-2012 specifications (see following subsections for more information). There are 55 limited access incidental catch permit holders in the fishery, and over 2,000 open access permit holders.

Table 49 Number of Vessels by Atlantic Herring Permit Category, 2008-2010

		Year		
		2008	2009	2010
Herring Permit Category	A	45	45	42
	B	5	4	4
	C	58	55	55
	D	2,409	2,394	2,258

Source: NMFS Permit databases, May 2011

As Table 50 demonstrates, in 2010, 30 out of the 46 vessels (65%) that held a Category A or B herring permit (limited access directed fishery) were "active," meaning they landed herring within that year. Twenty seven percent (27%) of Category C vessels (limited access incidental catch) landed herring in 2010, while only 4% of Category D permits landed herring in 2010. However, the number of D permits that landed herring increased significantly in 2010 to 94, up from 67/68 in 2009/2008 respectively.

Table 50 "Active" vs. "Latent" Vessels by Category, 2008-2010

	2008			2009			2010		
Category	Total # of Vessels	Active Vessels	Difference	Total # of Vessels	Active Vessels	Difference	Total # of Vessels	Active Vessels	Difference
A/B	50	30	20	49	31	18	46	30	16
C	58	10	48	55	13	42	55	15	40
D	2,409	68	2,341	2,394	67	2,327	2,258	94	2,164

Note: Active is defined in the above table as having landed one pound or more Atlantic herring during that fishing year.

Many herring vessels also hold permits from 16 other federally regulated species (Table 51). The open access, herring Category D permit holders hold the most permits in other fisheries, particularly Bluefish, Spiny Dogfish, Monkfish, Northeast Multispecies, Squid/Mackerel/Butterfish and Skate. Percent dependence on other species is discussed later in this document. Many of the A and B vessels hold general category permits for other species.

Table 51 Number of Other Federal Permits Held by Herring Category Permit Held, 2008-2010

Fishery	Category	2008				2009				2010			
		A	BC	C	D	A	BC	C	D	A	BC	C	D
Bluefish	1	39	5	47	2,159	40	4	45	2,153	38	4	45	2,035
	2			2	435			3	459			3	448
Black Sea Bass	1	13	5	36	555	12	4	33	565	12	4	33	548
	2			1	429			2	438			2	437
Spiny Dogfish	1	42	5	50	2,115	43	4	49	2,172	41	4	49	2,066
Summer Flounder	1	16	5	40	710	17	4	37	728	16	4	37	704
	2			1	444			2	468			2	455
General Category Scallop	A	2		5	217	3		5	246	3		5	238
	B	2		4	79	2		6	106	2		6	100
	C	9	1	16	181	11	2	15	223	10	2	16	211
American Lobster	1	16	5	46	840	18	4	43	849	16	4	43	815
	2				20				21				20
	A1	2		10	465	3		11	456	3		11	429
	A2	1	1	8	213	1	1	8	209	1	1	8	202
	A3				58			1	56			1	56
	A4				38				39				39
	A5				19				19				20
	A5W				10				12				12
	A6			2	38			2	39			2	37
	AOC			2	114			2	104			2	103
Monkfish	A	1			12	1			14	1			14
	B				35				34				35
	C	8	1	11	267	8	1	11	270	7	1	11	261
	D	5		22	264	8	1	20	269	7	1	20	256
	E	26	2	20	1,517	23	2	20	1,496	22	2	19	1,415
	F		2									1	2
	H				1				1				1

Source: NMFS Permit databases, May 2011

Table 51 Number of Other Federal Permits Held by Herring Category Permit Held, 2008-2010, continued

Fishery	Category	2008				2009				2010			
		A	BC	C	D	A	BC	C	D	A	BC	C	D
Northeast Multispecies	A	12	5	39	821	14	4	37	819	13	4	36	787
	C				9				10				7
	D				45				43				42
	E	1		2	33	2		2	33	1		2	33
	F				19				21			1	17
	HA	1			64	1			70	1			63
	HB	13		2	734	11		3	746	10		3	693
	I				357				374				360
	J	4		9	221	4		8	225	4		8	227
	K	23		10	764	19		10	749	19		10	711
Ocean Quahog	6	27	2	26	647	26	1	25	636	24	1	23	595
	7				13				12				12
Atlantic Deep Red Sea Crab	A	28	4	35	1,443	29	3	35	1,417	28	3	35	1,405
	B				3				3				3
	C												1
Limited Access Scallop	2	4		5	190	5		5	193	4		5	195
	3				1				1				1
	5			5	41			4	40			4	41
	6	1		1	23	1		1	28	1		1	25
	7				9				10				9
Scup	1	14	5	38	579	13	4	35	590	13	4	35	564
	2			1	425			2	450			2	433
Surf Clam	1	27	2	27	660	26	1	26	643	24	1	24	598
Scallop	1A	14		4	818								
	1B	13	3	17	320								
Skate	1	34	5	50	1,980	33	4	47	1,987	31	4	47	1,898
Squid/Mackerel/Butterfish	1	14	5	35	292	13	4	32	301	13	4	32	285
	2			1	424			2	445			2	437
	3	24	1	24	1,671	27	1	24	1,658	25	1	22	1,584
	4	40	5	48	1,887	42	4	46	1,892	40	4	47	1,795
	5	12	3	17	43	11	2	15	43	11	2	15	42
Tilefish	1					35	4	40	1,813	35	4	41	1,773
	2							2	141			2	181
	B				3				3				
	C		2		13		1		10				
	D	36	3	44	1,861	35	3	40	1,635				

Source: NMFS VTR databases, May 2011

5.5.1.3 Economic Factors

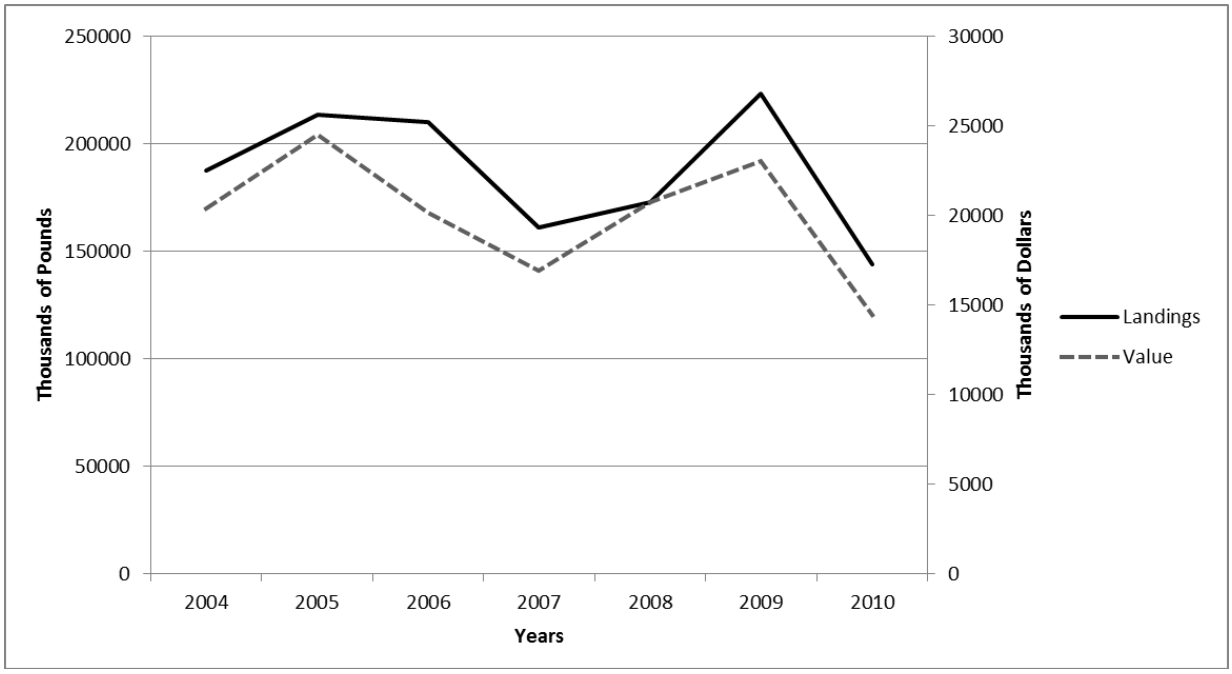
The information provided in this section is based on herring VTR and Dealer data through 2010, however 2010 data are preliminary at the time of this writing; final 2010 catch totals will be provided by NMFS when available. Where noted, economic values have been adjusted for inflation using the Bureau of Labor Statistics Producer Price Index for Unprocessed Finfish, with the base set to January 2009.

Figure 70 contains the total annual landings, in thousands of pounds, and value, in thousands of 2009 dollars, on a yearly scale. There is a slight downward trend, although 2005 and 2009 showed a slight increase from 2004 and 2008, respectively. Fishery value peaked in 2005 at a little over 27 million dollars for the over 200 million pounds landed, however landings peaked in 2009. In 2010, there were 143,666,029 pounds of Atlantic herring were sold by federally permitted dealers for a total ex-vessel value of $17,918,000. This represents a 22% decrease in revenues from the 2009 fishing year, primarily due to the implementation of the 2010-2012 fishery specifications, which included significant reductions in herring catch limits.

Figure 71 shows the total landings, in thousands of pounds, and the average real price per pound, in dollars, from 2005 to 2010, on a monthly time scale. Prices are cyclical and tend to be higher in the summer months and lower during the winter. This may be related to demand for herring as bait in the lobster fishery.

Categories A and B vessels specialize in small pelagics (herring, mackerel, and squid) while most of the C and D vessels catch herring either incidentally or seasonally in smaller amounts.

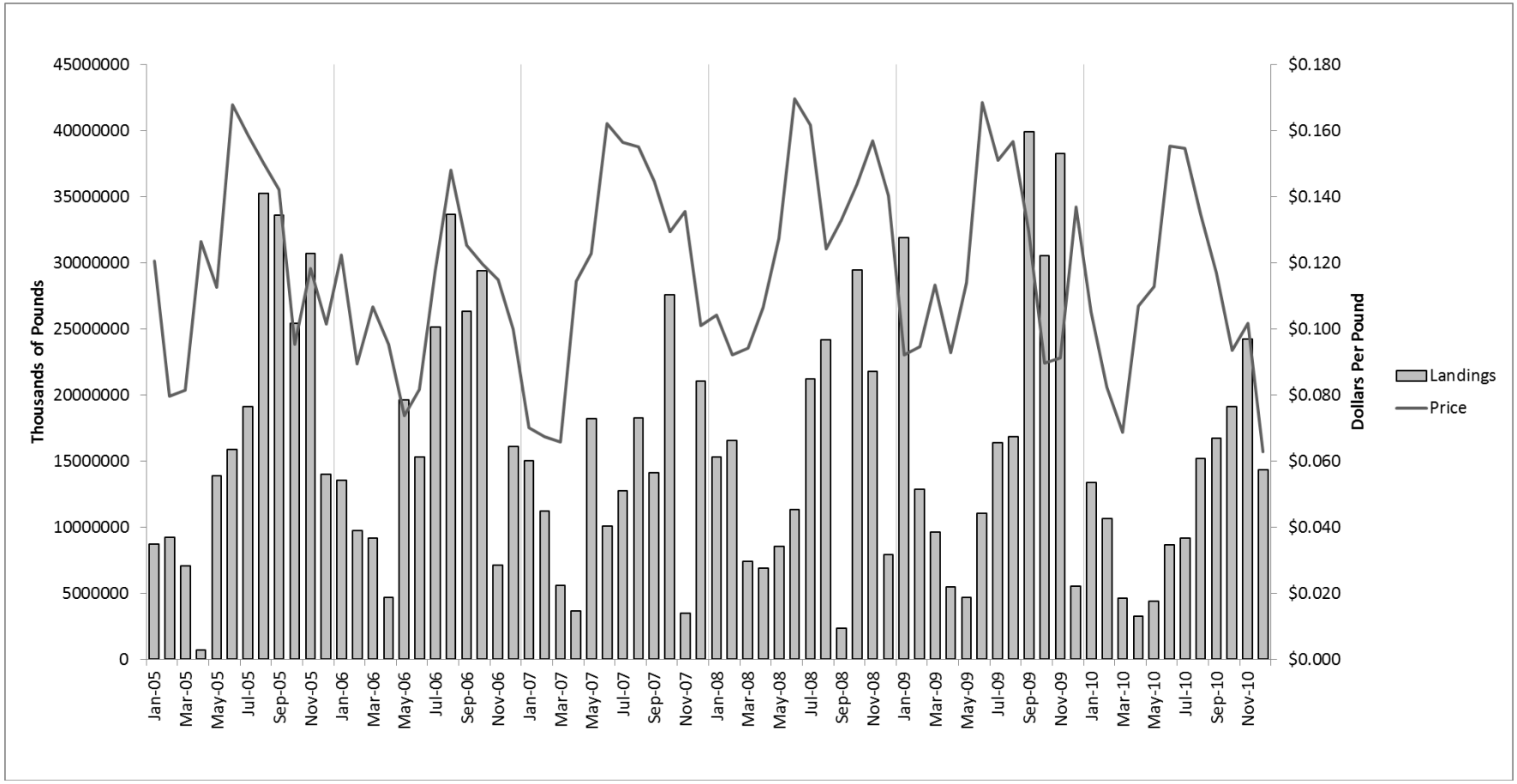
Figure 70 Total Annual Landings (Thousands of Pounds) and Value of Herring (Thousands of 2009 Dollars), 2004 -2010



Source: Dealer data
Numbers above have been adjusted for inflation based on 2009 data.

Table 52 reports revenue, in thousands of dollars, and landings, in thousands of pounds, broken down by species, and the permit category to which the boat belonged from 2007 to 2010. For 2007, vessels were classified into the "new" Amendment 1 limited access categories (A/B/C/D), instead of the pre-Amendment 1 (1/2) categories.

Figure 71 Total Landings (Thousands of Pounds) and Average Price Per Pound (Dollars), 2005 - 2010



Source: Dealer data
Numbers above have been adjusted for inflation based on 2009 data

Table 52 Total Revenue (Thousands of Nominal Dollars) and Landings (Thousands of Pounds), by Species Caught and Vessel Category, 2007-2010

		Herring		Menhaden		Mackerel		Squid		Other	
	Category	Revenue	Landings	Revenue	Landings	Revenue	Landings	Revenue	Landings	Revenue	Landings
2007	A and B	19,102	167,077	364	6,300	6,908	60,690	9,739	22,745	12,850	8,142
	C	245	1,726	658	10,189	41	133	1,968	2,535	13,483	8,414
	D	457	4,745	1,383	21,096	362	3,350	16,583	20,304	485,582	190,375
2008	A and B	21,723	182,606	1,598	16,482	6,162	48,438	10,845	29,138	11,385	7,529
	C	26	152	791	11,959	47	150	4,172	7,014	20,054	12,451
	D	129	1,000	2,286	28,508	139	601	18,745	22,733	483,974	192,250
2009	A and B	23,919	225,651	361	3,752	8,409	49,135	10,008	34,813	10,778	6,196
	C	183	1,112	530	7,632	62	226	3,778	4,875	18,856	13,525
	D	33	215	1,359	17,334	217	923	14,802	21,205	481,273	195,363
2010	A and B	18,449	142,627	451	4,518	3,158	21,103	11,591	30,549	15,857	9,331
	C	322	1,655	673	10,291	44	157	3,170	4,593	21,725	13,896
	D	150	916	1,237	16,350	84	322	12,974	15,007	550,708	195,078

Source: Dealer data

The species category "Other" includes any other federally permitted species besides herring, menhaden, mackerel and squid.

The dependence of Category A and B vessels on small pelagics is illustrated in Table 53, which reports the fraction of revenue for the four permit Categories from 2007 to 2010. Category C vessels derived at 81.9% of their total revenues from species which were not small pelagics, while category D vessels derived over 97% of their revenue from those species. Clearly, the Category C and D vessels are not relying on the herring fishery for a large fraction of their fishery income – herring composes 1.9% and 0.2% of total revenue for those two permit categories.

Table 53 Percent Dependence of Herring Vessels on Different Species by Category, Calculated Using Revenue

		2007	2008	2009	2010	Average Across All Years
Category A	Herring	36%	44%	49%	44%	43%
	Menhaden	1%	3%	1%	2%	2%
	Mackerel	19%	14%	13%	7%	13%
	Squid	12%	15%	14%	18%	15%
	Other	32%	25%	23%	30%	27%
Category B	Herring	*C	*C	17%	13%	13%
	Menhaden	*C	*C	*C	*C	0%
	Mackerel	5%	1%	*C	0%	2%
	Squid	38%	42%	40%	29%	37%
	Other	45%	49%	41%	57%	48%
Category C	Herring	2%	0%	2%	3%	2%
	Menhaden	2%	3%	3%	2%	2%
	Mackerel	0%	0%	0%	0%	0%
	Squid	7%	13%	12%	13%	11%
	Other	88%	84%	83%	82%	84%
Category D	Herring	0%	0%	0%	0%	0%
	Menhaden	0%	0%	0%	0%	0%
	Mackerel	0%	0%	0%	0%	0%
	Squid	2%	2%	2%	2%	2%
	Other	97%	97%	97%	97%	97%

Source: Dealer data
The species category "Other" includes any other federally permitted species besides herring, menhaden, mackerel and squid.
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

Between 2007 and 2010, the majority of herring was landed in Massachusetts, Maine, New Jersey, and Rhode Island. Table 54 characterizes each state that fish were landed in from vessels that held a herring permit by the species landed and year, by showing the revenue and landings for each. Massachusetts landed the most herring, and Maine had the second highest landings in all years. Menhaden caught by herring permit holders were landed primarily in New Jersey, and mackerel caught by herring permit holders were landed primarily in Massachusetts. Squid landed by herring permit holders was caught primarily in New Jersey and Rhode Island.

Table 54 Total Revenue (Thousands of Dollars) and Landings (Thousands of Pounds) of All Species by Landed States and Species, 2007-2010

		2,008		2,009		2,010	
		Revenue	Landings	Revenue	Landings	Revenue	Landings
CT	Herring	*C	*C	*C	*C	*C	*C
	Menhaden	*C	*C	*C	*C	*C	*C
	Mackerel	17	83	33	119	12	39
	Squid	562	488	497	484	662	554
	Other	12,211	5,004	11,772	5,671	12,381	5,771
MA	Herring	11,702	100,864	12,399	130,778	7,986	69,574
	Menhaden	1,780	15,264	871	9,240	676	6,843
	Mackerel	4,064	37,511	3,498	31,324	1,358	12,394
	Squid	1,543	1,596	1,112	1,242	1,606	1,374
	Other	264,674	102,846	263,253	104,692	328,976	110,172
ME	Herring	9,001	71,133	8,793	69,275	9,103	59,267
	Menhaden	279	2,744	45	467	*C	*C
	Mackerel	2	18	2	6	34	183
	Squid	6	7	*C	*C	1	1
	Other	19,270	13,779	16,804	12,277	19,347	13,210
NH	Herring	120	979	350	3,306	430	3,730
	Menhaden	0	0	0	0	0	0
	Mackerel	3	19	6	21	2	7
	Squid	1	1	0	0	0	0
	Other	13,497	7,522	13,828	8,617	15,614	7,471
NJ	Herring	404	6,256	1,176	13,261	227	3,701
	Menhaden	2,573	38,556	1,210	17,622	1,662	24,097
	Mackerel	1,308	8,857	1,998	10,071	428	4,392
	Squid	8,273	23,902	7,177	28,256	7,619	21,721
	Other	88,232	21,222	87,647	24,712	101,870	24,000
NY	Herring	4	25	4	21	2	13
	Menhaden	8	49	10	58	8	54
	Mackerel	43	167	44	141	23	90
	Squid	5,480	5,617	4,713	4,494	4,525	4,013
	Other	22,768	11,219	30,272	13,456	18,882	12,029
RI	Herring	645	4,495	1,412	10,331	1,167	8,854
	Menhaden	*C	*C	*C	*C	0	0
	Mackerel	910	2,534	3,103	8,588	1,415	4,422
	Squid	17,826	27,011	14,917	25,762	12,770	20,422
	Other	29,266	26,862	24,002	23,248	25,624	24,955

Source: Dealer data
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

Table 55 summarizes the top ports of landed herring by the total revenue generated in 2007, 2008, 2009, and 2010. Gloucester is the highest port of landing in every year, and Rockland, Portland and New Bedford trade off as the second, third, and fourth highest ports of landing through the years. It is important to note that some ports were not reported in the list due to issues of confidentiality.

Table 55 Top Ports of Landing (State and City) and Total Revenue (Thousands of Dollars), 2007-2010

2007		
MA	GLOUCESTER	4,594
ME	ROCKLAND	4,242
MA	NEW BEDFORD	2,585
ME	PORTLAND	2,087
ME	PROSPECT HARBOR	1,652
ME	STONINGTON	1,048
RI	POINT JUDITH	474
ME	PORT CLYDE	434
MA	FALL RIVER	273

2008		
MA	GLOUCESTER	7,481
MA	NEW BEDFORD	4,129
ME	ROCKLAND	3,583
ME	PORTLAND	2,564
ME	STONINGTON	1,667
ME	PORT CLYDE	588
RI	POINT JUDITH	322
MA	FALL RIVER	87

2009		
MA	GLOUCESTER	7,791
MA	NEW BEDFORD	3,997
ME	PORTLAND	3,337
ME	ROCKLAND	2,473
ME	STONINGTON	995
RI	POINT JUDITH	714
ME	PROSPECT HARBOR	667
MA	FALL RIVER	593
ME	PORT CLYDE	335

2010		
MA	GLOUCESTER	5,553
ME	PORTLAND	4,253
ME	ROCKLAND	3,144
MA	NEW BEDFORD	2,167
ME	STONINGTON	438
RI	POINT JUDITH	365
MA	FALL RIVER	262
ME	PROSPECT HARBOR	177

Source: Dealer and VTR data. Only those ports that had more than 3 vessels land herring or 3 or more dealers purchasing herring are reported.

Share System:

As in most fisheries in the country, the crew members of vessels do not receive a set wage; instead, they are compensated through the share system. Currently, crew share is usually 30-40%, and there is some variability in the way expenses are paid. For example, sometimes the variable costs are deducted "off the top." In this case variable costs are subtracted from gross revenues and crew receives their share of those net proceeds. In other systems, the crew receives their share of gross revenues minus all of the variable costs. Approximately 15 years ago, the shares were divided evenly with 50% to the owner, 50% split among the crew. Slowly, however, that ratio has changed.

5.5.1.3.1 Limited Access Vessels

5.5.1.3.1.1 Category A/B Vessels (2008-2010)

The following section provides information on Category A and Category B permit holding vessels, with data summarized from 2008 to 2010. To protect confidentiality, Category B permit holders have been grouped with Category C permit holders in some places. Data from 2010 are preliminary, and will be updated when possible.

Table 56 summarizes the vessel length of Category A and B permit holders for 2008, 2009, and 2010. Slightly over 60% of A and B permit holders are boats that are larger than 80 feet in length, about 21% of the vessels are mid-range in size. Category A vessels are primarily land most of their fish in Massachusetts and Maine (Table 57). These are the states with shoreside infrastructure (processing plants) that supports the herring fishery. Category B vessels (limited access directed fishery in Areas 2 and 3 only) and Category C vessels (limited access incidental catch) tend to identify principal ports throughout mid-coast Maine, New Hampshire, southern New England, and the Mid-Atlantic region.

Table 56 Distribution of Herring Vessel Length for Category A and B Vessels, 2008-2010

	Category A and B		
Vessel Length	2008	2009	2010
<60	8	7	7
60-80	12	11	10
>80	32	31	29
Total	52	49	46

Source: NMFS Permit data

Table 57 Number of Category A and B Herring Vessels by Permit Category and Principal Port, 2008-2010

	Category A			Category B		
	2008	2009	2010	2008	2009	2010
CT Total						
MA Total	**19**	**18**	**15**			
BOSTON	1					
GLOUCESTER	7	7	5			
NEW BEDFORD	9	9	8			
WOODS HOLE	2	2	2			
ME Total	**10**	**12**	**13**			
HARPSWELL	1					
OWLS HEAD		1	1			
PORTLAND	3	5	4			
PROSPECT HARBOR	1	1	1			
ROCKLAND	2	2	3			
ROCKPORT			1			
SOUTHWEST HARBOR	1	1	1			
STONINGTON	1	1	1			
VINALHAVEN	1	1	1			
NH Total	**2**	**2**	**2**			
NEWINGTON	2	2	2			
NJ Total	**8**	**5**	**5**			
CAPE MAY	8	5	5			
NY Total						
RI Total	**4**	**4**	**5**	**5**	**4**	**4**
DAVISVILLE	2	2	2			
NEWPORT				2	1	1
NORTH KINGSTOWN			1			
POINT JUDITH	2	2	2	3	3	3

Source: NMFS Permit data

Table 58 and Table 59 summarize the average crew size, based on VTR reported crew sizes, by the home port listed in permit data and the gear used as listed in the VTR data, respectively. Crew sizes for Category A and B permit holders rage from 4 people to 10 people.

Table 58 Average Crew Size (Including Captain) by Home Port for Category A and B Vessels, 2008-2010

		2008	2009	2010	Average Across Years
MA	BOSTON	6	6	6	6
	GLOUCESTER	6	6	6	6
	NEW BEDFORD	5	5	5	5
	Average for MA	6	6	6	6
ME	BATH	6	5	4	5
	CUNDYS HARBOR	6	6	6	6
	HAMPDEN	7	7	7	7
	OWLS HEAD		5	4	5
	PORTLAND	6	6	6	6
	Average for ME	6	6	6	6
NH	NEWINGTON	6	5	5	6
	Average for NH	6	5	5	6
NJ	CAPE MAY	4	5	5	5
	Average for NJ	4	5	5	5
RI	DAVISVILLE	10	10	10	10
	NEWPORT	4	3	3	3
	POINT JUDITH	4	4	4	4
	Average for RI	5	4	5	5

Source: NMFS VTR data

Table 59 Average Crew Size (Including Captain) by Gear Category (A and B), 2008-2010

		2008	2009	2010
Category A	OTF	6	5	6
	OTM	5	6	5
	PTM	5	5	5
	PUR	6	7	6
	Average Across A Gears	**6**	**6**	**5**
Category B	OTF	4	4	3

Source: NMFS VTR data

Table 60 characterizes the landings for Category A and BC permit holders by gear type and area fished from VTR data.

Table 60 Atlantic Herring Landings (Thousands of Pounds) for Federally Permitted Herring Vessels by Area Fished, Gear Type and Permit Category (A and B), 2008– 2010

		2008		2009		2010	
		A	BC	A	BC	A	BC
Area 1A	OTTER TRAWL,MIDWATER	2,506		4,565		4,643	
	PAIR TRAWL,MIDWATER	32,496		41,838		34,280	
	POT, HAG	C*					
	POT,LOBSTER					C*	
	SEINE, PURSE	52,840		47,641		15,415	
Area 1B	OTTER TRAWL,MIDWATER	2,984		C*		2,279	
	PAIR TRAWL,MIDWATER	11,574		3,494		7,708	
	SEINE, PURSE	5,575		1,395		2,140	
Area 2	OTTER TRAWL,BOTTOM,FISH	3,125	1,305	5,949	3,144	6,057	1,624
	OTTER TRAWL,MIDWATER	1,214		3,446		3,259	
	PAIR TRAWL,MIDWATER	43,535		47,756		29,221	
Area 3	OTTER TRAWL,BOTTOM,FISH			C*			
	OTTER TRAWL,MIDWATER	2,113		5,218		9,670	
	PAIR TRAWL,MIDWATER	22,851		60,259		26,765	
	SEINE, PURSE					C*	

Source: NMFS VTR data
BC permits are vessels that had both B and C permits during the same year; C permits are vessels that only had a C permit during a year.
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

Table 61 shows the landings of Category A vessels by gear type, as a percentage of total herring landings. Category BC only used bottom trawls from 2008-2010, and is not reported in the table. Purse seiners typically use the inshore areas (1A, 1B) while trawl gear can fish in all Areas. In 2010, participants indicated that herring in Area 1A held "tight to the bottom" making them unavailable to purse seines. Pair trawl (midwater) has dominated landings in Area 1B, Area 2 and Area 3 for all three of the years depicted. However, this gear type also experienced large declines in landings in 2010 compared to 2009.

Table 61 Category A Atlantic Herring Landings by Gear Type, as a Percent of Category A Herring Landings and Total Herring Landings, 2008-2010

	2008		2009		2010	
	% of Category A Landings	% of 2008 Total Herring Landings	% of Category A Landings	% of 2009 Total Herring Landings	% of Category A Landings	% of 2010 Total Herring Landings
OTTER TRAWL,BOTTOM,FISH	2%	2%	3%	3%	4%	4%
OTTER TRAWL,MIDWATER	5%	5%	6%	6%	14%	14%
PAIR TRAWL,MIDWATER	61%	60%	69%	68%	69%	67%
SEINE, PURSE	32%	32%	22%	22%	12%	12%
Category A % of Total Herring Landings		99%		98%		97%

Source: NMFS VTR data
Some gears and percentages omitted for confidentiality.

Table 62 reports the landings of Category A and BC permit holders, summarized by the species caught (not including herring, see Table 60 for herring landings) and the area in which they were fished for. Category A permit holders caught mackerel, menhaden and squid primarily in Area 2, and Category BC permit holders caught squid and "Other" species primarily in Area 2.

Table 62 Herring Category A and B/C Vessel Landings by Species, 2008-2010

		2008		2009		2010	
		A	BC	A	BC	A	BC
Area 1A	Mackerel					*C	
	Menhaden	5,017		*C			
	Squid					*C	
	Other	366		12		47	
Area 1B	Mackerel					*C	
	Other	604				521	
Area 2	Mackerel	36,735	45	46,355	88	20,909	8
	Menhaden	11,465		3,740		4,518	
	Squid	24,294	1,868	29,589	1,136	29,348	1,089
	Other	1,506	1,635	79,684	1,307	2,584	1,645
Area 3	Mackerel	11,813		2,532		*C	
	Squid	2,831	145	3,625	380	34	77
	Other	1,818	318	6,156	380	3,802	295

Source: NMFS VTR data
B/C permits are vessels that had both B and C permits during the same year; C permits are vessels that only had a C permit during a year.
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

5.5.1.3.1.2 Category C Vessels (2008-2010)

The following section provides information on Category C permit holding vessels, with data summarized from 2008 to 2010. Data from 2010 are preliminary, and will be updated when possible.

Table 63 summarizes the vessel length of Category C permit holders for 2008, 2009, and 2010. The majority of these vessels are less than 80 feet in length, although the distribution is split between those vessels that are smaller than 60 feet and those that fall between 60 and 80 feet. Category C vessels (limited access incidental catch) tend to identify principle ports throughout mid-coast Maine, New Hampshire, southern New England, and the Mid-Atlantic region (Table 64).

Table 63 Distribution of Herring Vessel Length for Category C Vessels, 2008-2010

	Category C		
Vessel Length	2008	2009	2010
<60	21	22	23
60-80	29	26	25
>80	8	7	7
Total	58	55	55

Source: NMFS Permit data

Table 64 Number of Category C Herring Vessels by Principal Port, 2008-2010

	Category C		
Row Labels	2008	2009	2010
CT Total	**2**	**2**	**2**
MYSTIC	1	1	1
NEW LONDON	1	1	1
MA Total	**9**	**8**	**7**
BRANT ROCK	1	1	1
FAIRHAVEN	1	1	1
GLOUCESTER	3	2	2
NEW BEDFORD	3	3	2
NEWBURYPORT	1	1	1
ME Total	**9**	**10**	**10**
EAST HARPSWELL	1	2	2
NEW HARBOR	2	2	2
PORTLAND	2	2	2
SACO	1	1	1
SOUTH BRISTOL	3	3	3
NH Total	**6**	**6**	**6**
HAMPTON	1	1	1
PORTSMOUTH	2	2	2
RYE	2	2	2
SEABROOK	1	1	1
NJ Total	**11**	**9**	**9**
CAPE MAY	10	8	8
WILDWOOD	1	1	1
NY Total	**5**	**5**	**5**
GREENPORT	1	1	1
MONTAUK	4	4	4
RI Total	**13**	**12**	**13**
NEWPORT	2	1	1
POINT JUDITH	11	11	12

Source: NMFS Permit data

Table 65 and Table 66 summarize the average crew size, based on VTR reported crew sizes, by the home port listed in permit data and the gear used as listed in the VTR data, respectively. Crew sizes for Category C permit holders range from two to five people, the larger crews tending to come from ports in Massachusetts, New Jersey and New York.

Table 65 Average Crew Size (Including Captain) by Home Port for Category C Vessels, 2008-2010

		2008	2009	2010	Average Across Years
MA	GLOUCESTER	4	4	4	4
	NEWBURYPORT			3	3
	ROCKLAND		3	3	3
	Average for MA	4	4	4	4
ME	NEW HARBOR		5		5
	SOUTH BRISTOL		5	5	5
	Average for ME		5	5	5
NH	HAMPTON	2	2	3	2
	PORTSMOUTH	2		2	2
	RYE	2	2	2	2
	SEABROOK	2		2	2
	Average for NH	2	2	2	2
NJ	CAPE MAY	3		4	4
	Average for NJ	3		4	4
NY	MONTAUK	3	4	4	4
	Average for NY	3	4	4	4
RI	POINT JUDITH	2	2	2	2
	Average for RI	2	2	2	2

Source: NMFS Permit and VTR data

Table 66 Average Crew Size (Including Captain) by Gear Type for Category C Vessels, 2008-2010

	2008	2009	2010
OTF	2	3	3
PUR		5	5
Average Across Gears	**2**	**3**	**3**

Source: NMFS VTR data

Table 67 characterizes the landings for Category C permit holders by gear type and area fished from VTR data. Some vessels used multiple gear types for fishing, and this designation was necessary to show vessel general vessel activity in the different herring areas.

Table 67 Atlantic Herring Landings (Thousands of Pounds) for Category C Vessels by Area Fished and Gear Type, 2008 – 2010

		2008	2009	2010
Area 1A	OTTER TRAWL,BOTTOM,FISH	122	140	68
	OTTER TRAWL,BOTTOM,SHRIMP	*C	141	113
	SEINE, PURSE		629	950
Area 1B	OTTER TRAWL,BOTTOM,FISH	*C		
Area 2	OTTER TRAWL,BOTTOM,FISH	23	196	522
Area 3	OTTER TRAWL,BOTTOM,FISH		*C	*C

Source: NMFS VTR data
**C denotes a value for which less than three (3) boats reported, and cannot be reported for confidentiality reasons.*

Table 68 shows the landings by gear type as a percentage of total herring landings. Category C vessels, primarily caught herring using bottom trawl gear in 2008 and purse seine gear in 2009 and 2010. This suggests that Category C permit holders regarded the exclusion of the midwater and pair trawl vessels from Area 1 as an opportunity to increase their participation in the herring industry.

Table 68 Category C Atlantic Herring Landings by Gear Type, as a Percent of Category C Herring Landings and Total Herring Landings, 2008-2010

	2008		2009		2010	
	% of Category C Landings	% of 2008 Total Herring Landings	% of Category C Landings	% of 2009 Total Herring Landings	% of Category C Landings	% of 2010 Total Herring Landings
OTTER TRAWL,BOTTOM,FISH	97%		31%		36%	
OTTER TRAWL,BOTTOM,SHRIMP	3%		13%		7%	
SEINE, PURSE			57%		57%	1%
Category C % of Total Herring Landings						1%

Source: NMFS VTR data
Some gears and percentages omitted for confidentiality. C permits are vessels that only had a C permit during a year.

Table 69 reports the landings of Category C permit holders, summarized by the species caught (not including herring, see Table 60 for herring landings) and the area in which they were fished for. Category C permit holders caught menhaden, squid, and "Other" species primarily in Area 2, although some "Other" were caught in areas 1A and 3.

Table 69 Herring Category C Vessel Landings by Species, 2008-2010

		2008	2009	2010
Area 1A	Mackerel		2	
	Menhaden	430	430	
	Squid	2	4	
	Other	2,297	436	1
Area 1B	Mackerel	1		
	Squid	2		
	Other	343		361
Area 2	Mackerel	128	194	110
	Menhaden	11,529	7,202	10,291
	Squid	6,672	4,856	4,421
	Other	8,237	12,252	8,224
Area 3	Mackerel	21	31	47
	Squid	338	16	202
	Other	1,574	47	2,838

Source: NMFS VTR data
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

5.5.1.3.2 Open Access Vessels (Category D) (2008-2010)

The following section provides information on Category D permit holding vessels, with data summarized from 2008 to 2010. Data from 2010 are preliminary, and will be updated when possible.

Table 70 summarizes the vessel length of Category D permit holders for 2008, 2009, and 2010. About 73 percent of the vessels that hold Category D permits are smaller than 60 feet in length, however there are still over 200 vessels that are greater than 80 feet in length. Unlike Categories A-C, Category D vessels (open access incidental catch) are numerous and participate in a wide variety of fisheries throughout the Northeast Region (Table 71).

Table 70 Distribution of Herring Vessel Length for Category D Vessels, 2008-2010

	Category D		
Vessel Length	2008	2009	2010
<60	1762	1761	1656
60-80	422	411	377
>80	225	222	225
Total	2409	2394	2258

Source: NMFS Permit data

Table 71 Number of Category D Herring Vessels by Principal Port State, 2008-2010

	Category D State Total		
	2008	2009	2010
CT	46	42	39
MA	902	912	865
ME	339	333	297
NH	122	120	116
NJ	361	351	331
NY	226	234	234
RI	152	149	138

Source: NMFS Permit data

Table 72 and Table 73 summarize the average crew size, based on VTR reported crew sizes, by the home port listed in permit data and the gear used as listed in the VTR data, respectively. Crew sizes for Category D permit holders range from 1 to 4 people, smaller on average than Categories A, B or C.

Table 72 Average Crew Size (Including Captain) by Home Port for Category D Vessels, 2008-2010

		2008	2009	2010	Average Across Years
CT	NEW LONDON	4			4
	NOANK		2	1	1
	STONINGTON		2		2
	Average for CT	4	2	1	2
MA	BOSTON	3	3	2	2
	FALMOUTH			3	3
	GLOUCESTER	4	3	2	3
	NEWBURYPORT			3	3
	PROVINCETOWN	2		1	2
	ROCKPORT	2	2	2	2
	SCITUATE	2	2	2	2
	Average For MA	3	3	2	3
ME	BASS HARBOR			2	2
	BIDDEFORD	3		3	3
	BREMEN		4	2	2
	CAMP ELLIS	2		2	2
	CUNDYS HARBOR			2	2
	ISLESFORD	1	1	1	1
	JONESPORT	2	2	2	2
	KENNEBUNKPORT	2			2
	KITTERY	2		3	2
	PORTLAND		3		3
	SACO			3	3
	SMALL POINT	3	3		3
	SOUTH BRISTOL		2		2
	VINALHAVEN		4	4	4
	WELLS HARBOR			1	1
	WESTPOINT		2	3	2
	YORK		2		2
	YORK HARBOR	2			2
	Average for ME	2	2	2	2
NH	NEW CASTLE			2	2
	PORTSMOUTH	1	1	1	1
	RYE			1	1
	SEABROOK	2	2	2	2
	Aveage for NH	2	2	2	2
NJ	BARNEGAT LIGHT	2	2	2	2
	BARNEGATE LIGHT	2	2	2	2
	BELFORD	2	2	2	2
	BELMAR		2		2
	BRIGANTINE		1	1	1
	CAPE MAY			4	4
	HEISLERVILLE	1	1	1	1
	LAVALLETTE	3	2	2	2
	LITTLE EGG HARBOR	1			1
	MANAHAWKIN	1			1
	POINT PLEASANT	2	2	2	2
	POINT PLEASANT BEACH	2	2	2	2
	TOMS RIVER		3		3
	WARETOWN		2	2	2
	Average for NJ	2	2	2	2
NY	CENTER MORICHES	1	1	1	1
	EAST HAMPTON	1	1		1
	EAST QUOGUE	1		1	1
	FREEPORT	1	1	1	1
	HAMPTON BAYS	2	2	2	2
	ISLAND PARK		2		2
	MONTAUK	3	3	2	2
	NEW YORK	2	2	2	2
	SHINNECOCK	2	2	3	2
	Avearage for NY	1	2	2	2
RI	WAKEFIELD	4		4	4
	Average for RI	4		4	4

Source: NMFS Permit data

Table 73 Average Crew Size (Including Captain) by Gear Type for Category D Vessels, 2008-2010

	2008	2009	2010
OTF	2	2	2
OTM		2	1
PUR	5	4	2
Average Across Gears	**2**	**2**	**2**

Source: NMFS Permit and VTR data

Table 74 characterizes the landings for Category D permit holders by gear type and area fished from VTR data. Category D vessels only land a small amount of herring.

Table 74 Atlantic Herring Landings (000's of pounds) for Category D Vessels by Area Fished and Gear Type, 2008 – 2010

		2008	2009	2010
Area 1A	GILL NET,SINK	2	5	1
	HAND LINE/ROD & REEL			
	OTHER GEAR			*C
	OTTER TRAWL, BEAM		4	
	OTTER TRAWL, RUHLE			*C
	OTTER TRAWL,BOTTOM,FISH	145	98	251
	OTTER TRAWL,BOTTOM,SHRIMP	8	4	493
	OTTER TRAWL,MIDWATER			*C
	POT,LOBSTER	*C	*C	1
	SEINE, PURSE	765	35	74
	TRAP	6	7	11
Area 1B	OTTER TRAWL,BOTTOM,FISH			*C
	SEINE, PURSE	*C		
Area 2	DREDGE,SCALLOP,SEA			*C
	GILL NET,DRIFT,LARGE MESH			
	GILL NET,RUNAROUND			2
	GILL NET,SINK	3	4	5
	HAND LINE/ROD & REEL		1	
	OTTER TRAWL,BOTTOM,FISH	34	37	74
	OTTER TRAWL,BOTTOM,SHRIMP			*C
	POT,CRAB		*C	
	POT,FISH			*C
Area 3	HAND LINE/ROD & REEL			*C
	OTTER TRAWL,BOTTOM,FISH	*C		*C

Source: NMFS VTR data
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

Table 75 shows the landings by gear type as a percentage of total herring landings. Category D vessels only land a small amount of herring using a wide variety of gears.

Table 75 Category D Atlantic Herring Landings by Gear Type, as a Percent of Category D Herring Landings and Total Herring Landings, 2008-2010

	2008		2009		2010	
	% of Category D Landings	% of 2008 Total Herring Landings	% of Category D Landings	% of 2009 Total Herring Landings	% of Category D Landings	% of 2010 Total Herring Landings
GILL NET,SINK	1%		4%		1%	
HAND LINE/ROD & REEL			1%			
OTTER TRAWL, BEAM			2%			
OTTER TRAWL,BOTTOM,FISH	18%		69%		35%	
OTTER TRAWL,BOTTOM,SHRIMP	1%		2%		54%	
SEINE, PURSE	80%		18%		8%	
TRAP	1%		4%		1%	
Category D % of Total Herring Landings						

Source: NMFS VTR data
Some gears and percentages omitted for confidentiality.

Table 76 reports the landings of Category D permit holders, summarized by the species caught (not including herring, see Table 60 for herring landings) and the area in which they were fished for. Category D permit holders caught mackerel, menhaden, squid and other species in all areas, but caught relatively little in Area 1B.

Table 76 Herring Category D Vessel Landings by Species, 2008-2010

		2008	2009	2010
Area 1A	Mackerel	44	46	75
	Menhaden	*C	25	
	Squid	27	20	260
	Other	31,466	91	
Area 1B	Mackerel			3
	Menhaden		*C	
	Squid		2	
	Other	13,074	3	12,553
Area 2	Mackerel	243	583	86
	Menhaden	28,350	17,308	16,356
	Squid	20,464	21,013	13,748
	Other	88,941	38,904	95,304
Area 3	Mackerel	313	297	159
	Squid	2,220	176	1,131
	Other	58,860	514	56,835

Source: NMFS Permit and VTR data
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

5.5.1.3.3 VMS Utilization

Table 77 summarizes the number of herring permits which utilized VMS in the year 2010, broken down by the Category permit and the number of other multispecies permits held. Herring Category A, B and C vessels are required to have VMS. Category D does not, however, and of the 88 Category D vessels that reported herring catch on their VTRs in 2010, only 11 vessels actively used VMS.

Table 77 2010 Herring Permits by Category and Herring/Multispecies Combinations

Herring Permit Category	Herring Only	Herring with Multispecies Limited Access		Herring with Mults Open Access**	Total
		A*, D*, E*, F*	C**, HA**	HB, I, J, K	
A	8	14	1	19	42
B***	0	4	0	0	4
C****	0	39	0	12	51
D	144	887	71	1,144	2,246
Total	152	944	72	1,175	2,343

* VMS and weekly VTR required

** Weekly VTR required; No VMS

*** All B permitted vessels also have a C permit

**** Does not include C permits that are associated with B permits

Source: NERO

5.5.1.3.4 VTR Landings for All Federally Permitted Herring Vessels

Table 78 characterizes the fishing days, number of trips taken, and thousands of pounds landed by the area that was fished, the Category permit held, and the year. The number of fishing days for Category D vessels increased considerably between 2008 and 2010, likely due to changes in regulations of other fisheries, such as Amendment 16 to the Multispecies FMP. The number of trips and days fell in 2009 in Area 1B for Category A vessels but rebounded in 2010, while rising in Area 2 in 2009.

Table 79 characterizes the fishing days, number of trips taken, and thousands of pounds landed by the area that was fished, the gear type, and the year. Area 2 has seen an increase in the number of bottom and midwater trawls fishing in the area, and Area 1B has had the number of purse seines fishing within vary over the last three years. Area 2 and 3 has had fluctuating numbers of vessels fishing within them over the past three years.

Table 78 Herring Trips, Days, and Herring Landed (thousands of pounds) by Area Caught and Category Permit, 2008-2010

		Area 1A			Area 1B			Area 2			Area 3		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Category A	Days at Sea	727	768	703	153	80	181	797	930	748	230	523	435
	Number of Trips	275	279	250	57	25	51	182	249	171	53	119	105
	000's of Pounds Landed	88,392	94,043	54,417	20,133	5,534	12,127	47,874	57,152	38,538	24,964	65,673	36,576
Category BC	Days at Sea							34	67	55			
	Number of Trips							31	62	48			
	000's of Pounds Landed							1,305	3,144	1,624			
Category C	Days at Sea	98	133	193	7			83	112	152		10	12
	Number of Trips	98	108	140	2			43	50	74		3	3
	000's of Pounds Landed	126	910	1,132	*C			23	196	522		*C	*C
Category D	Days at Sea	194	141	382	1		3	324	406	444	12		10
	Number of Trips	186	129	376	1		1	257	334	334	2		3
	000's of Pounds Landed	927	154	834	*C		*C	37	43	89	*C		*C

Source: NMFS VTR data

BC permits are vessels that had both B and C permits during the same year; C permits are vessels that only had a C permit during a year.

**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons.*

Table 79 Herring Trips, Days, and Herring Landed (thousands of pounds) by Area Caught and Gear Type, 2008-2010

		Area 1A			Area 1B			Area 2			Area 3		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Bottom Trawl	Days at Sea	227	149	280	7		3	516	600	743	12	25	20
	Number of Trips	227	138	269	2		1	264	362	336	2	5	4
	000's of Pounds Landed	267	239	320	*C		*C	4,487	9,327	8,278	*C	200	1
Midwater Trawl	Days at Sea	17	46	32	31	13	40	49	129	75	22	64	103
	Number of Trips	4	18	11	10	3	10	11	22	18	5	13	24
	000's of Pounds Landed	2,506	4,565	4,643	2,984	*C	2,279	1,214	3,446	3,259	2,113	5,218	9,670
Pair Trawl	Days at Sea	222	203	298	71	46	103	562	634	405	208	444	330
	Number of Trips	66	79	89	27	13	26	131	162	97	48	104	80
	000's of Pounds Landed	32,496	41,838	33,644	11,574	3,494	7,708	43,535	47,756	29,221	22,851	60,259	26,765
Purse Seine	Days at Sea	498	578	464	52	21	38						2
	Number of Trips	211	215	205	21	9	15						1
	000's of Pounds Landed	53,605	48,304	16,439	5,606	1,395	2,140						*C

Source: VTR data

BC permits are vessels that had both B and C permits during the same year; C permits are vessels that only had a C permit during a year.

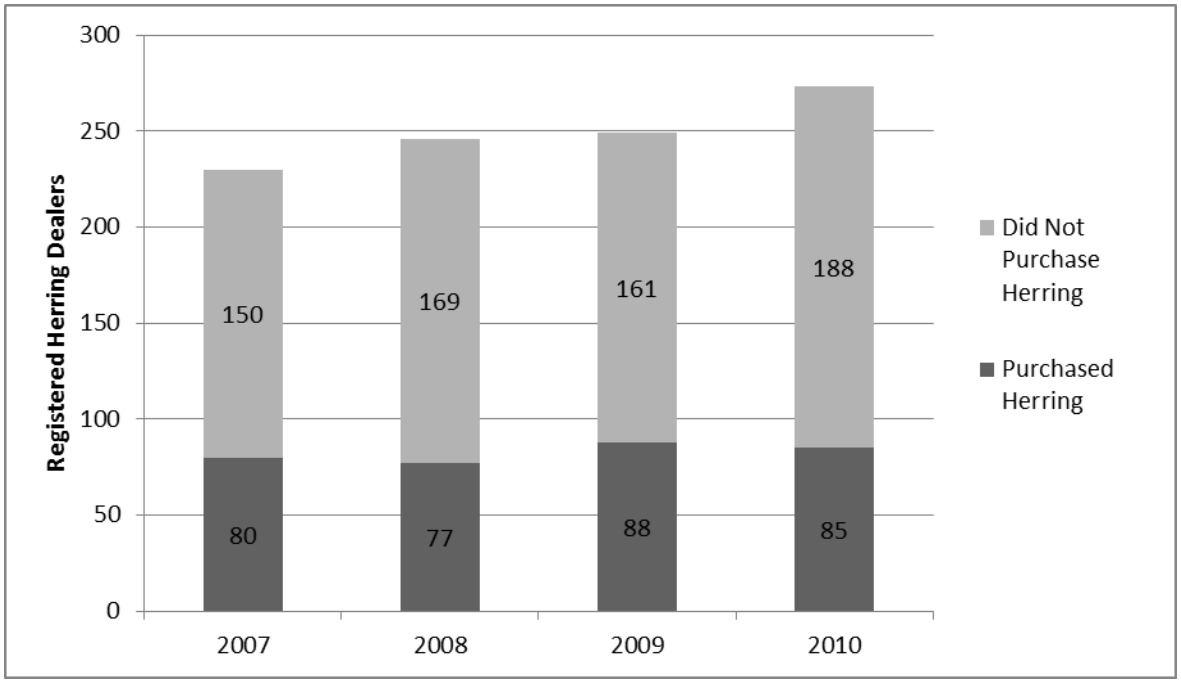
**C denotes a value for which less than 3 boats reported, and cannot be reported for confidentiality reasons*

5.5.1.4 Herring Dealers and Carriers

5.5.1.4.1 Number of Dealers

Federally permitted dealers must be permitted to sell different species of fish by selecting that species in their dealer permit application form; there is no cost select any or species in this application. Figure 72 illustrates the number of dealers registered by the amount that did and did not purchase herring. Between 2007 and 2010, the number of registered herring dealers increased from 230 to 273. The number of permitted dealers which purchased herring increased from 80 to 85. Table 80 shows the number of active herring dealers by the state of registration that have purchased herring at least once since the year 2000.

Figure 72 Number of Federally Permitted Dealers Registered as Herring Dealers, by Purchase Status, 2007-2010



Source: NMFS Dealer data

Table 80 Yearly Number of Federally Permitted Dealers Who Purchased Herring, by State of Registration

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CT							1				1
DE								1	1		
MA	4	4	7	8	7	8	8	12	9	13	10
MD	2		2	1	1		2	1	1	1	1
ME	18	41	39	42	38	45	46	49	44	53	50
NC						1		1			1
NH	2	1	1	3	3	2	2	2	2	2	3
NJ	1	3	3	2	4	5	6	5	4	3	4
NY	1	4	3	3	12	11	10	11	15	14	15
RI	9	6	5	6	7	8	8	9	7	8	7
VA		1	1		2	1			1		
Total	37	60	61	65	74	81	83	91	84	94	92

Source: NMFS Dealer data

Table 81 shows the revenue and landings, by state, of herring purchased by dealers from 2007 to 2010. Table 82 shows the percent of herring dealers that purchased herring by the state that they purchased herring and the state in which they are registered. For instance, in 2010, dealers that were registered in Massachusetts bought 90% of their total herring purchases from landings within the state of Massachusetts, but purchased 7% of their herring from landings in Maine. They purchased no herring from New Jersey or New York, and 2% of their herring purchased was from landings that occurred within the state of Rhode Island. For the most part dealers purchased herring where were landed in their state , but Massachusetts and Maine had some out-of-state purchases. The significant numbers of dealers in Maine likely reflects the numbers and dispersal of small lobster fishing communities along the Maine coast that rely on herring as lobster bait.

Table 81 Revenue (thousands of dollars) and Landings (thousands of pounds) Purchased by Federally Permitted Dealers, by state of purchase

		MA	ME	NH	NJ	NY	RI
2007	Revenue	94	65	1	7	0	5
	Landings	12	8	0	1	0	1
2008	Revenue	133	62	3	14	0	10
	Landings	8	9	0	0	0	1
2009	Revenue	72	56	3	4	0	8
	Landings	38	33	1	2	0	4
2010	Revenue	372	254	8	30	0	30
	Landings	0	0	0	0	0	0
	Total Revenue	671	437	15	55	0	53
	Total Landings	58	49	1	4	0	6

Source: NMFS Dealer data
The 2007 data may have accuracy problems due to dealer serial numbering being un- or misreported.

Table 82 Percent of Herring Purchased by Federally Permitted Dealers, by State of Registration, 2007-2010

2007		State of Purchase						
		MA	ME	NJ	NY	RI	Other	Total Revenue
State of Registration	MA	**82%**	9%	0%	0%	9%	0%	4,603
	ME	22%	**75%**	0%	0%	2%	1%	10,585
	NJ	2%	0%	**98%**	0%	0%	0%	421
	NY	2%	0%	1%	**98%**	0%	0%	18
	RI	1%	0%	0%	0%	**99%**	0%	372
	Other	32%	24%	0%	0%	0%	**44%**	118

2008		State of Purchase						
		MA	ME	NJ	NY	RI	Other	Total Revenue
State of Registration	MA	**91%**	7%	0%	0%	2%	0%	7,188
	ME	29%	**69%**	0%	0%	1%	0%	11,161
	NJ	6%	0%	**89%**	0%	0%	4%	468
	NY	0%	0%	0%	**99%**	0%	1%	36
	RI	8%	0%	0%	0%	**92%**	0%	330
	Other	56%	15%	0%	0%	0%	**29%**	255

2009		State of Purchase						
		MA	ME	NJ	NY	RI	Other	Total Revenue
State of Registration	MA	**96%**	2%	0%	0%	2%	0%	8,439
	ME	27%	**70%**	0%	0%	3%	1%	10,594
	NJ	0%	0%	**100%**	0%	0%	0%	1,168
	NY	12%	0%	0%	**88%**	0%	0%	24
	RI	5%	0%	0%	0%	**95%**	0%	603
	Other	50%	17%	0%	0%	0%	**33%**	468

2010		State of Purchase						
		MA	ME	NJ	NY	RI	Other	Total Revenue
State of Registration	MA	**90%**	7%	0%	0%	2%	0%	5,576
	ME	22%	**77%**	0%	0%	1%	0%	10,414
	NJ	0%	0%	**99%**	0%	1%	0%	246
	NY	0%	0%	9%	**91%**	0%	0%	9
	RI	2%	0%	0%	0%	**98%**	0%	630
	Other	7%	16%	0%	0%	0%	**77%**	279

Source: NMFS Dealer data
The state category "Other" includes the states of Connecticut, Delaware, Maryland, North Carolina, New Hampshire, and Virginia, to protect confidentiality.
Total revenue for each state is also presented for perspective on the percentages.

5.5.1.4.2 Number of Carrier Vessels

The Letters of Authorization (LOAs) issued by NMFS for the Atlantic herring fishery currently allow an unlimited amount of herring (or the amount allowed by the vessels' herring permit) to be transferred at-sea (a) from herring catcher vessels to carriers; (b) between federally permitted herring vessels; and (c) from herring catcher vessels to non-permitted vessels for personal use as bait (Section 3.1.3.1).

Table 83 shows the total number of vessels that received Letters of Authorization by the year and type of authorization. In the year 2010, there were 50 carrier exemptions, doubling the number issued in 2006. Table 84 shows the VTR reports that indicated carrier activity had occurred. Activity was down from 58 reports in 2009 to 49 in 2010. Vessels can be issued both exemption types within one fishing year.

The list of vessels wanting to engage in carrier activities will change from year to year, and some of the vessels with Category D permits may already have VMS required by multispecies and scallop permits. Table 83 and Table 86 illustrate this point, and also demonstrate the overlap between exemption types. The number of D vessels with LOAs increased from 11 in 2008 to 21 in 2010. These tables also illustrate the number of smaller vessels (less than 50 feet) already have VMS, required by the herring permit that they possess.

Table 83 Total Herring Vessels that Received a Letter of Authorization (LOA) by Year and Type of Exemption

FISHING_YEAR	EXEMPTION_TYPE	Total
2006	HERRING CARRIER	6
2006	HERRING TRANSFER AT SEA	19
2006 Total		**25**
2007	HERRING CARRIER	16
2007	HERRING TRANSFER AT SEA	27
2007 Total		**43**
2008	HERRING CARRIER	13
2008	HERRING TRANSFER AT SEA	26
2008 Total		**39**
2009	HERRING CARRIER	18
2009	HERRING TRANSFER AT SEA	23
2009 Total		**41**
2010	HERRING CARRIER	15
2010	HERRING TRANSFER AT SEA	35
2010 Total		**50**

Source: NMFS permit data

Table 84 Total VTR Herring Carrier Reports by Year; Only Herring Carrier Activity That Was Reported

YEAR	Total
2007	46
2008	33
2009	58
2010	49
Total	186

Table 85 Vessel Permit and Size Information for Herring Vessels Carrying LOAs, 2009

	LOA EXEMPTION TYPE			VESSEL SIZE		HERRING PERMIT CATEGORY		
Vessel	Herring Carrier	Herring Transfer At Sea	Total	Length	Gross Tons	A	C	D
1		1	1	42	20			1
2		1	1	40	15			1
3		1	1	45	4		1	
4		1	1	36	10			1
5		1	1	42	23			1
6	1		1	42	23			1
7		1	1	51	22		1	
8		1	1	34	12			1
9	1		1	42	5			1
10		1	1	40	22			1
11	1	1	2	38	20			1
12		1	1	42.4	23		1	
13		1	1	44	24		1	
14	1		1	56	45		1	
15	1		1	44	36			1
16		1	1	53	47			1
17	1		1	59	60			1
18		1	1	58	66	1		
19	1	1	2	113	165	1		
20	1		1	72	116		1	
21	1		1	57	106	1		
22	1	1	2	79	170	1		
23		1	1	117	197	1		
24	1	1	2	81.3	187	1		
25	1		1	97	164	1		
26		1	1	78	176	1		
27	1		1	123	199	1		
28	1	1	2	97.5	193	1		
29	1	1	2	130	199	1		
30	1		1	96.9	152	1		
31		1	1	109	189	1		
32	1	1	2	141	195	1		
33	1	1	2	130	199	1		
Total	**18**	**23**	**41**			**15**	**6**	**12**

Source: NMFS Permit data

Table 86 Vessel Permit and Size Information for Herring Vessels Carrying LOAs, 2010

	LOA EXEMPTION TYPE			VESSEL SIZE		HERRING PERMIT CATEGORY		
Vessel	Herring Carrier	Herring Transfer At Sea	Total	Length	Gross Tons	A	C	D
1		1	1	42	20			1
2		1	1	40	15			1
3		1	1	45	30		1	1
4		1	1	36	10			1
5		1	1	36	5			1
6		1	1	42	23			1
7		1	1	43	20			1
8		1	1	46	5			1
9		1	1	23	2			1
10		1	1	51	22		1	
11		1	1	38	17			1
12		1	1	44	21			1
13	1	1	2	38	20			1
14		1	1	35	17			1
15		1	1	42.4	23		1	
16	1		1	65	57			1
17		1	1	50	30			1
18		1	1	50.6	47			1
19	1		1	44	36			1
20		1	1	53	47			1
21		1	1	50	67			1
22	1		1	50	64			1
23		1	1	58	66	1		
24		1	1	79	101		1	
25	1	1	2	113	165	1		
26		1	1	76	112			1
27	1		1	72	116		1	
28	1		1	57	106	1		
29	1	1	2	79	170	1		
30	1	1	2	117	197	1		
31		1	1	81.3	187	1		
32	1	1	2	78	176	1		
33	1	1	2	123	199	1		
34	1	1	2	97.5	193	1		
35	1	1	2	130	199	1		
36		1	1	101	197	1		
37		1	1	109	189	1		
38		1	1	141	195	1		
39	1	1	2	101	476	1		
40	1	1	2	130	199	1		
Total	**15**	**35**	**50**			**15**	**5**	**21**

Source: NMFS Permit data

5.5.1.5 Herring Processors

5.5.1.5.1 Cape Seafoods (Gloucester, MA)

The following information was provided by a representative of Cape Seafoods in August 2011. It includes the views of the company's representative on how the company has been affected by herring management:

Cape Seafoods is a purpose built facility for landing, handling and processing herring and mackerel. The company, formed in June 2001, is located on the Jodrey State Pier in Gloucester Massachusetts, leasing space from the Commonwealth of Massachusetts. Due to lower volume throughput, the company is negotiating a reduction of 50 percent of the space currently being occupied.

Adjacent to the processing plant, the company operates a cold store and blast freezers. Cape Seafoods has been receiving the vast majority of its supplies of fresh herring and mackerel from three midwater trawlers, namely F/V Challenger, F/V Endeavour and F/V Voyager, owned and operated by an associate company, Western Sea Fishing Company, Inc. At this time, due to over precautious quota reductions, restrictive bycatch caps and scientifically unsupportable "gear type" area restrictions, the vessel owners have decided to offer the F/V Voyager for sale. This has resulted in a number of lost jobs. The factory and the cold store are continuing to operate with fewer employees and lower pay rates for existing staff.

Processing Operations and Capacity

Herring represents approximately 75 percent of the volume handled each year. The fresh fish is pumped from the vessels' refrigerated seawater (RSW) tanks directly into the plant for processing or for sales into the various bait markets. As part of the processing, fish are graded by size into a number of different weight categories prior to freezing.

Cape Seafoods ships some frozen production in refrigerated shipping containers. These containers are hauled by local trucking companies to the cold store for loading by local lumpers. Once loaded, the containers are trucked back to the Boston shipping terminal for loading onto container ships.

Markets

There is a substantial demand from domestic lobster and tuna bait markets for fresh, salted and frozen herring. The bait department at Cape Seafoods operates seasonally and supplies both fresh and frozen bait to local lobster and tuna fishermen. Atlantic herring, processed by Cape Seafoods, also supplies a number of established export markets.

Employment

There were 20 to 25 crew members on the three dedicated fishing vessels operated by Western Sea Fishing Company. This has been reduced to 15 people because of the pending sale of one of the vessels. Western Sea Fishing Company employs 4 people full-time in vessels' management, maintenance and administration. Cape Seafoods employs 14 full-time individuals on a year-round basis. These year-round employees are all local area residents who have had their hourly pay rates, and number of hours worked per week, reduced during these difficult times.

Cape Seafoods and Western Sea Fishing Company use local area suppliers for such things as loading containers, electrical maintenance, building modifications, packaging supplies, fork lift operators, skilled plant operators, food and fuel for the vessels, trucking, freezing and cold storage.

5.5.1.5.2 Lund's Fisheries, Incorporated (Cape May, NJ)

Established in 1954, Lund's Fisheries, Inc. produces, imports, and trades fisheries products from around the world. The company's primary products include Atlantic mackerel, Atlantic herring, Boston loligo squid, California loligo squid, illex squid, Atlantic croaker, sea trout, porgy or scup, butterfish, bluefish, menhaden, monkfish, sea scallops, and conch.

The Lund's facility, located on the water in Cape May, NJ, is one of the largest seafood processing facilities on the Eastern Seaboard. With over 1,200 feet of waterfront the facility has a minimum of 15 vessels landing fish on a daily basis. Lund's produces for local fresh markets such as Boston, New York, Philadelphia, and Baltimore and freezes product for both domestic and export markets, as they become available. The Lund's facility is equipped with blast freezers capable of freezing up to 500 metric tons of fish per day. Lund's is also equipped with automated packing equipment specifically designed for pelagic fish, which allows the company to process 450 metric tons of whole round fish per day (Lund's Fisheries website, www.lundsfish.com).

One of Lund's affiliated companies is "Shoreline Freezers" that provides public cold storage for seafood and agricultural products. Another affiliated company is Sun Coast Calamari in Oxnard, California, which produces 200 metric tons of frozen California Squid per day.

Mackerel, when it is available to the local fleets, is an important product for Lund's, as the plant is equipped to handle about 30,000 mt during the January-April season. The plant also processes several mt of herring annually, although recent management measures including the GOM midwater trawl ban and conservative haddock catch cap volumes have combined to make herring less available to the plant in some years. Mackerel and herring are the focus of operations from January – April, with squid, scallops and a variety of finfish becoming more important for the remainder of the year. During times of full production, the plant employs about 100-150 individuals. About 65-70 of the employees are full-time, and most laborers live within a 30 mile radius of Cape May, NJ (Lund's, personal communication).

It is important to note that the information provided, including estimates of production, capacity, and employment, have not been verified by the Herring PDT through any independent sources of information.

5.5.1.5.3 Natural Pearl Essence (Engelhard Corporation, Eastport, ME) Closed

The last commercial natural pearl essence plant in the world closed in 2007 when the Engelhard Corporation was bought by BASF, the German chemical company. Natural pearl essence was extracted from the scales of Atlantic herring and used to add a pearl effect (a satiny luster that creates a soft, cloud-like luster) to shampoo, fingernail polish and other personal care products and cosmetics.

The Eastport Port Authority is under contract to purchase the BASF property on Broad Cove, but in the meantime, BASF has approved use of their property for transporting the base units that will eventually hold tide turbines planned for Cobscook Bay (French, 2011).

5.5.1.5.4 The Northern Pelagic Group (NORPEL, New Bedford, MA)

In April 2011, NORPEL temporarily closed its operation and sent one of the fishing vessels it had leased back to the West Coast (F/V Dona Martita). All but two employees were laid off. A letter to the NEFMC from the principals of NORPEL, Cape Seafoods (Gloucester) and the Maritime Terminal (New Bedford) indicated that the closure was due to the impact of the closure of Area 1A to trawlers in the summer and the strict haddock bycatch limits that made it impossible to harvest herring for fear of too great a bycatch of haddock. . In late October 2011, some herring was being landed by independent vessels at NORPEL for processing with the help of temporary employees.

The following information was provided by NORPEL and Maritime International Inc. during 2003 when the companies were optimistic about their future. It is provided as a baseline, indicating what has transpired since the company's opening, including what steps the company took to develop their operation for full capacity and the benefits it hoped to offer New Bedford.

The Northern Pelagic Group, LLC (NORPEL) is a pelagic processing plant based in New Bedford, Massachusetts that opened its doors on December 30, 2002, six months after construction of the facility began. Its partners are U.S. citizens, with experience in U.S. east and west coast fisheries development and marketing. Business planning for the facility started in January/February 2002. Prior to becoming a pelagic processing facility, the property on which NORPEL is located was a lumber yard/home repair store.

NORPEL is 100% dependent on pelagic fisheries (herring – 70% – and mackerel). Since inception, approximately $10 million has been invested in the development of the freezing facility, including recent investment in 2004 of $3.5 million to expand the capacity of the facility. This does not include investment of approximately $12 million associated with NORPEL'S two dedicated fishing vessels, F/V Dona Martita and Nordic Explorer, which were relocated in the Fall of 2002 from the west coast and refit for the herring and mackerel fisheries. These vessels were critical elements in the NORPEL business plan to ensure the NORPEL facility had a committed supply of herring on which to base its operations. This base of supply is augmented by other "vessels of opportunity" which can choose to make deliveries to the plant. However, without these dedicated vessels, NORPEL would not have been able to finance the investment in shoreside processing of pelagics, and without them would be facing substantial difficulty to operate profitably in the future. An additional $5 million had been previously invested by Maritime International, Inc., NORPEL's dedicated cold storage and stevedoring provider, with improvements to docks, cold storage facilities and the property infrastructure to accommodate NORPEL and their plans.

In general, NORPEL's processing operations are composed of about 70% herring and 30% mackerel. Processing herring can be a year-round business, while processing mackerel occurs primarily during the peak season, January – April. NORPEL began freezing mackerel in early January 2003. During the peak mackerel season in 2003, NORPEL was receiving some fish from about eight vessels in the area. NORPEL began freezing herring in June 2003, and since then has purchased herring from 10 vessels, both midwater trawl and purse seiners.

NORPEL processes herring for both the food and bait markets but concentrates the majority of its operations on the food market. While NORPEL is capable of processing herring on a year-round basis, there is some seasonality associated with obtaining a food-grade product. In the spring, when the fish are "feedy," the product is less desirable. The feed tends to react in the stomachs of the fish, causing the stomach linings to burst when they defrost. May is a relatively slow month in terms of processing herring for the food market. To address this issue, and reduce potential histamine issues associated with fish

older than 24 hours since harvest, NORPEL has been investing heavily in research to retard the effects of these phenomena, which appears to be related to temperature control and hold water circulation. The company is making progress with innovative handling techniques designed to minimize, if not eliminate, the problem. If successful, this will add value to the product and reduce the need to have "fresh" fish (caught and delivered within 24 hours).

NORPEL estimates that with the influence of seasonality and market conditions, the plant could process fish about 200 of 365 days in a year. The plant is designed to run 24 hours a day so that it can operate in conjunction with the cyclical nature of the fishery. The processing capacity of the plant is currently about 450 tons per day. NORPEL estimates that it could process about 30,000-35,000 mt of fish during 2005, possibly 40,000 mt depending on fish availability, weather, and market conditions.

Committing vessels to serve the plant is a key element of NORPEL's long-term business strategy. Two dedicated midwater trawl vessels are committed to the plant through cross ownership: (1) 163 feet in length with a 400 ton hold capacity and (2) 120 feet in length with a 300 ton hold capacity. These two vessels came to New Bedford from the West Coast in October/November 2002 as part of NORPEL's business plan for consistently supplying product to the new facility. These vessels possess federal permits for the Atlantic herring and squid/mackerel/butterfish fisheries. These vessels entered the herring and mackerel fisheries after the control dates were established in both fisheries.

The plant supplements its purchases of product with fish primarily from overages on other vessels (extra fish for which other vessels cannot find a market), which NORPEL sees as advantageous to everyone involved because the fish are utilized. The plant purchases herring caught in all herring management areas. Since inception, herring has been delivered from all management areas generally in the following proportions: 1A (20%), 1B (40%), 2 (10%) and 3 (30%). Area 1A/B is currently an important element of NORPEL's supply base, especially in 2004 given the bycatch of juvenile haddock experienced in Area 3.

Processing Operations

Vessels that catch herring for food markets hold the fish in refrigerated sea water (RSW) tanks (30-31°F) until the fish can be graded at the NORPEL facility. RSW tanks are critical to ensure a food-grade product. If the fish are considered to be acceptable for the food market, then NORPEL purchases them, places them in their own specially designed land RSW tanks (30-31° F), grades them to size, packs them into custom poly-coated cartons, and freezes them. In 2004, NORPEL doubled its on-site storage capacity of fresh fish, to ten large RSW holding tanks, which are computer-controlled and capable of holding nearly 600 mt.

There are also blast freezers located in an adjacent facility to supplement operations if larger fish (mackerel) are purchased. The adjacent cold storage facility (Maritime International Inc.) is capable of holding nearly 6,000 mt of processed product to help facilitate on-time deliveries according to customer's schedules.

Once frozen in blocks, the fish are packed into cartons (boxes) of 20-25 kg in size on a conveyor system. The conveyor packs about 15 boxes per minute and one pallet every three minutes. The packing machine operates with two people.

Markets

NORPEL processes herring and mackerel for food markets worldwide. On a global basis, the U.S. fisheries for pelagic species like herring and mackerel are small but growing. Since NORPEL and Cape Seafoods were constructed in Massachusetts in 2001-2002, U.S. production of small pelagics has increased by 50%, and Massachusetts has become the leading east coast producer of small pelagics. That

increase is important to hold market share since NORPEL is competing with foreign operations plants that are supplied by enormous pelagic fisheries (West Africa, for example).

The distance between the processing facility in New Bedford and the customers located throughout the world presents some difficulties for the plant. It can take 2-3 weeks for the customer to receive the product once the plant processes it. However, once NORPEL freezes a food-grade product, it has about a 12-month shelf life. In addition, NORPEL's relationship with Maritime International in New Bedford has helped to minimize problems associated with long-distance shipment (see below).

Employment And Economy

NORPEL has provided a boost to the economy in the fishing community of New Bedford. It employs 80-90 individuals over the course of a year, the majority of whom live in or near the community. Approximately 40 employees work each shift (two shifts/day) when the plant is operating at capacity, and this number varies based on the amount of product that needs to be processed at any given time. About 90-95% of the employees are of Central American descent (Guatemala, San Salvador). Eight individuals work for the processing facility full-time (engineers, managers). The plant offers competitive wages to its employees enabling them to support their families.

In addition, the two dedicated fishing vessels employ five crew members each and purchase food, fuel, and other supplies from local businesses. The captains and crew members of the two vessels are local residents, some of whom participated in fisheries on the West Coast for a period of time and have now come back to their home communities. Estimates of annual expenditure by the NORPEL dedicated vessels are $6 million per vessel on local services and supplies.

Future Plans

NORPEL's future plans include purchasing horizontal plate freezers for larger fish (mackerel) and specialty products. Since the 2004 $7 million expansion of RSW tanks and freezing capacity, there are no plans for additional significant expansion of the plant, primarily because the size of the property and the current facility make a significant expansion unrealistic. NORPEL plans to continue to process herring and mackerel on a year-round basis and expand its markets to match the current processing capabilities of the plant.

Maritime International

Much of the processed product from NORPEL is shipped overseas via Maritime International Inc., which is located adjacent to the processing facility in New Bedford. Overseas shipment occurs in high cube refrigerated containers designed to hold the product at the optimal temperature of –18 degrees Fahrenheit (0°C) to ensure freshness. Maritime International can arrange for either containerized cargo shipments or bulk/tramper carriage of nearly 4,000 mt per shipment. Clients can select either service based on the amount of cargo or product they require.

During the scoping process for Amendment 1, Maritime International provided estimates of financial expenditures associated with NORPEL cargo vessel loading operations. The estimates provided by Maritime International were based on one cargo vessel remaining in port for three days and spending money in the community for transportation, restaurants and entertainment, doctors, propane suppliers, and other associated industries. Estimates of expenditures associated with pilot boat operators, vessel agents, customs agents, lift trucks, courier services, and other items required to prepare the cargo ship for transport were also provided. With a potential of 15 cargo vessels per year, Maritime International estimated expenditures of at least $3.2 million in addition to those associated with processing, storage, container shipments, and local distribution.

In April, 2011, anticipating the potential permanent closure of NORPEL, Maritime International estimated that 89 to 93 jobs (warehousemen, stevedores, teamsters, shuttle truck drivers would be lost) and direct annual economic impact would be about $2.2 million.

NORPEL – Summary Information

Processing Operations:	Approximately 70% herring, 30% mackerel
Plant Capacity:	Approximately 450 tons per day, 200 days per year (60,000 tons)
Current Operations:	30,000-40,000 mt
Plant Employment:	80 individuals, 6 full-time 10 crew members for 2 fishing vessels

5.5.1.5.5 Seafreeze, Ltd.

The information presented below was partially based on a May 2004 site visit to the plant at Davisville, (North Kingston) RI and follow up phone calls carried out by individual PDT members. Some additional information was obtained from the company website in 2011. The Herring PDT wishes to thank the individuals at Sea Freeze Ltd for contributing the following information and helping the PDT provide a more comprehensive description of the current herring fishery and the importance of the herring fishery to the lobster industry. It is important to note that the information provided below, including estimates of production, capacity, and employment, have not been verified by the Herring PDT through any independent sources of information.

Seafreeze is the largest producer of sea-frozen fish on the east coast of the United States. It supplies sea-frozen and land-frozen fish to domestic and international markets including bait products to longline fleets. Seafreeze's two dedicated freezer trawlers are among the largest freezer trawlers on the east coast. At sea freezing produces a very high quality product, as the product is not damaged during loading and unloading. Catch is then marketed nationally and worldwide. Fishing operations target illex and loligo squid, mackerel, herring and to a lesser degree, butterfish. The vessels are approximately 150 ft in length with a holding capacity of approximately 280 mt and a daily freezing capacity of 50 mt per day.

Domestic sales account for approximately 30% of total sales and 70% are international. Internationally, Eastern Europe and Asia are two important regions that purchase from Seafreeze. Atlantic mackerel is sold to companies in Canada as baitfish and Illex squid is sold nationally as baitfish for the groundfish, swordfish and tuna fisheries as well as for crab and lobster bait. Zoos and aquariums also purchase Seafreeze products as feed for other species.

Illex squid and mackerel are the mainstay of the business accounting for approximately 80% of revenue. Although herring is the least financially valuable of the species it is nevertheless important to the business due to its year round availability and due to the fact that access to it continues after other fisheries have closed. In this respect, herring, for Seafreeze, is an important back-up fishery when other fisheries become unavailable.

Seafreeze began its operations in 1985 when it was initially a fishing operation with just a few employees. This company operated one of the first successful US freezer trawlers in the region and over time, cold storage facilities were added and later enlarged (current capacity 7,000 mt). The plant does not include any processing facilities, nor is it invested in the distribution of product. Operations are limited to catching, cold storing and marketing whole fish. The cold storage is used primarily for catch from the dedicated freezer trawlers though from time to time, other vessels unload and store here. Currently, the plant employs approximately 60 people including 10 administrative and managerial staff, 20 crew working rotating shifts, and 15 individuals that work in the storage facility (packing, loading etc.). These employees work full time and employment is generally stable year round. Employee turnover is generally low and when it occurs it is often due to crew seeking land based positions for personal reasons (family time etc.).

The seasonal operation of the plant is as follows:

Illex squid – May to October

Mackerel – January to May

Loligo squid – September to May

Herring – Year-round

Product supply is lowest during the spring and fall. As a result, these months are dedicated to vessel repairs and maintenance. Sales and distribution occur year-round.

Plant location was selected because of its access to transport mechanisms. The plant is accessible by deep-water port and rail access. Rail access is slower than other forms of distribution but it is significantly cheaper. The plant exists largely independent of the surrounding community (North Kingston). Employees live regionally, though not necessarily locally. Some local distribution of bait occurs in summer months and vessel fuel is purchased locally along with food for the crew. Some of the gear used on the trawlers is produced and repaired on site by a company that rents space from Seafreeze.

Representatives stated that more and more time is being dedicated to involvement in the management of the species each year. In the past, a small percentage of time was spent on management concerns (attending meetings, etc.), now as much as 50% of key staff time is spent investing in this aspect of the business. Representatives stated that this is one of the new costs of doing business in an increasingly regulated environment.

Regulations in the Loligo fishery were cited as having impacts on the business. Tighter regulations in this fishery has meant that Seafreeze has had to replace this product with other fish as current restrictions make this fishery less attractive for larger vessels. Also, regulations in other fisheries (such as groundfish) have meant that shifts are occurring between fisheries that also impact on business. Seafreeze representatives suggested that it is important in this regulatory environment to diversify where possible and not be too dependent on any one species.

Cold storage

In 2005 Seafreeze completed an addition to their cold storage facility, increasing capacity to about 23 million pounds. This has allowed the company to operate as a public cold storage facility. They can load and unload reefer vessels (trampers), refrigerated containers, refrigerated railcars and trucks. Currently they load 40 to 90 high capacity refrigerated rail cars annually.

Sea Freeze – Summary Information

Operations: Sea frozen fish and cold storage facilities
Plant Capacity: 7,000 mt of cold storage space

Current Operations (approximate numbers per year)

- Illex – 6,000 mt
- Mackerel – 6,000 mt
- Herring – 2,000 mt
- Loligo – 1,000 mt

Employment: 60 full time employees total; 20 fishermen – on rotating shifts, others divided between storage facility and administrative functions

5.5.1.6 Utilization of Herring in Other Fisheries

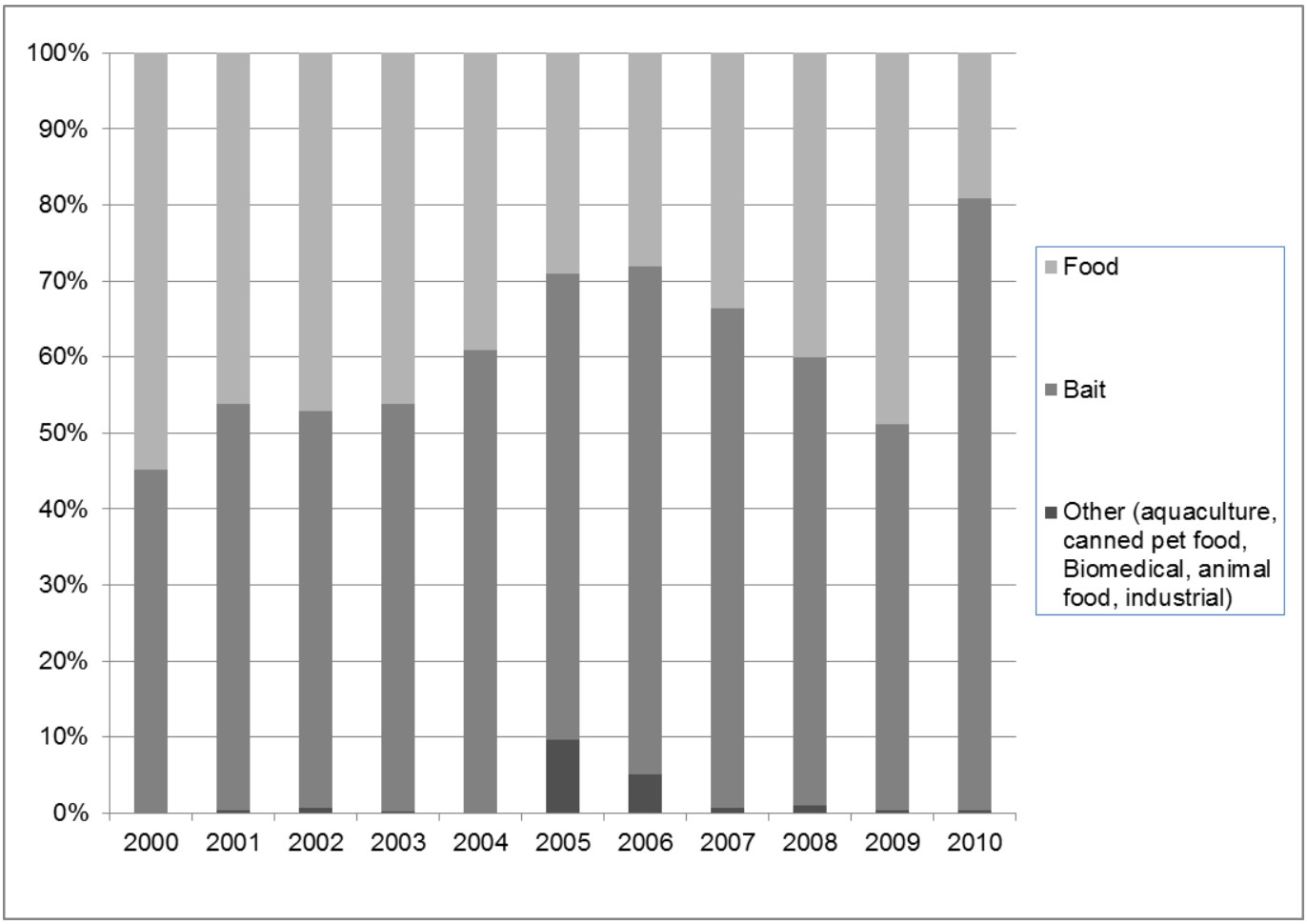
5.5.1.6.1 Bait

Herring is currently used for many fisheries, such as the lobster industry (regional), tuna and various recreational fisheries. The locations and processing and selling techniques also vary. For a more detailed description of herring as bait, and some the various ways in which herring are processed and sold, see Amendment 1 and Appendix I of this document (Volume II), respectively. A full description of herring bait dealers can also be found in Amendment 1, and updated descriptions of the bait dealers can be found below.

The bait industry has changed tremendously in the last seven years resulting in a much more centralized distribution structure. Generally the herring used for bait goes through a large wholesale dealer to smaller dealers and lobster wharfs along the coast. The wholesale dealers generally have facilities where they sort, barrel, freeze and store bait for redistribution.

A large proportion of herring catch is used as bait. NMFS collects ex-vessel prices and does not systematically collect information about bait prices. Figure 73 provides the percentage of reported herring landings utilized for bait and food from the dealer database during 2000-2010. Since 2001, more than 50% of herring landings are sold for bait on an annual basis. Herring landings that were used as bait increased steadily from 2000 to 2006, from less than 50% to over 70%. From 2007 -2009, the percentage of herring being used as bait decreased to approximately 50%, however in 2010 over 80% of the herring catch was used as bait. A small amount of the herring catch is used for non-food and non-bait purposes; this peaked in 2005 at nearly 10% and has declined steadily since that time.

Figure 73 Percentage of Herring Landings Reported for Food and Bait Usage 2000-2010



Source: NMFS Dealer Data

5.5.1.6.1.1 American Lobster Fishery

The lobster industry (particularly in Maine) depends greatly on herring bait to sustain itself. Small-scale truckers, bait shop owners, and related business all participate in the commercial bait venture. Bait can be delivered dockside from trucks traveling up and down the coast. In the past, trucks picked up the bait from canneries and community sites up and down the coast to service smaller bait shops or lobster fishing 'gangs' (Acheson 1987). The canneries are gone now, but herring is still delivered to important lobster communities. Island bound and coastal isolated lobster fishermen may also pick up bait directly off vessels, or have it brought out on ferries. In recent years, the shift has been towards vessels landing directly to island ports. A small proportion of lobster bait was supplied by the freezer plants in Massachusetts (Cape Seafoods and NORPEL). With both freezer plants in relative hiatus, however, it is unclear that they are the source of bait in 2011.

While bait choices vary with individual fishermen's preferences and fishery, lobster vessels in the State of Maine are perhaps the most dependent on herring for bait. Recently, however, pogies (menhaden) have also proved popular. Major dealers in Maine offer herring, pogies, redfish and flounder, haddock, carp racks, tuna heads, and Pacific rock fish, all with varying prices ranging from fifteen cents to 44 cents. In part due to the ASMFC limits on landing days, much of the herring is salted and frozen. Initially, lobstermen found the frozen product to be difficult to handle, but according to reports from dealers, they have adjusted. Lobster vessels in Massachusetts and New Hampshire also depend on herring for bait, but this dependency on herring decreases in more southern areas.

Fishery Description

The fishery for American lobster, *Homarus americanus*, is one of the top fisheries on the Atlantic coast of the US, with landings of close to 96.6 million pounds and valued at close to $299.5 million in 2009. Maine and Massachusetts together produced more than 92% of the total national landings. This represents an increase in landings but a decrease in value from 2008. Landings typically occur in inshore areas, and the species is managed jointly by the ASMFC and NOAA. The ASMFC manages the state waters (from 0 to 3 miles from shore), and NMFS manages from state water to the EEZ (3 to 200 miles from shore). Lobsters are most abundant inshore from Maine through New Jersey, with abundance declining from north to south, while offshore they occur from Maine through North Carolina. A more detailed description of the lobster industry can be found in Amendment 1 to the Atlantic Herring FMP.

Relevant Updated Regulations

Today, American lobster is managed under Amendment 3, which provides the flexibility to make changes to the management program through addenda, allowing resource and fishery concerns to be addressed promptly. Seven lobster management Areas are created through Amendment 3, as well as a Lobster Conservation Management Team (LCMT) for each management area. Made up of industry representatives, the LCMTs are responsible for recommending changes to their management plans. Since 1999 15 addenda to Amendment 3 have been approved. The documents for each addenda can be found at the Commission's website, www.asmfc.org. Major provisions within the Amendment and addendum include those such as: minimum and maximum carapace; length; maximum trap limits; prohibition on the possession of buried lobsters (lobster with eggs); prohibition on possession of lobster meat and lobster parts; trap configuration requirements; prohibition on spearing lobsters; prohibition on possession of female v-notched lobsters; limits on landings with non-trap gear, limits to entry into the fishery. Other addendum, such as the most recent Addendum XVI, address new reference points for each lobster stocks, based on recommendations from the Technical Committee and the Peer Review Panel from the 2009 stock assessment.

Stock Assessment/Landings

The resource is managed as three separate stocks: the Gulf of Maine (GOM), Georges Bank (GB), and Southern New England (SNE). The 2009 peer reviewed stock assessment (ASMFC, 2009) utilized a new model which incorporated lobster size and a broader range of data. It found that the GOM and GB stocks were experiencing record stock abundance and recruitment, while the SNE stock was experiencing low abundance and poor recruitment. While the success of the GOM and GB stocks meant that they were not depleted, and overfishing was not occurring, the Panel recommended that the ASMFC be prepared to impose restrictions should recruitment decline. The Panel also noted that productivity has been lower in the past, and warned that current levels of fishing would not be sustainable if recruitment were to decline again.

The assessment further found that the GOM supports the largest fishery, constituting approximately 76% of the U.S. landings between 1981 and 2007, while GB constitutes the smallest portion of the U.S. fishery, averaging 5%. Landings in the GOM averaged 33,000 mt from 2000-2007, and increased dramatically from 1990 to 2006. Landings in GB almost doubled between 2003 and 2007, with a high of 2,400 mt landed in 2005.

The SNE stock was determined to be depleted, although overfishing was not occurring. Abundance indices were determined to be at or near series lows. The distress experienced by the SNE stock was further examined in a Technical Committee Recruitment Failure in the SNE Stock (ASMFC, 2010) report, as additional monitoring information became available. The additional information indicated that the stock was continuing to fall lower than the assessment. The Technical Committee suggested that a combination of environmental and biological changes, as well as continued fishing was leading the stock to experience a recruitment failure. This recruitment failure was in turn preventing the stock from rebuilding.

SNE has the second largest fishery, accounting for 19% of the U.S. landings between 1981 and 2007. Contrary to GB and GOM, the landings in SNE increased between the 1980's and 1990's, and reached a peak in 1997 of 9,935 mt. It was in 1999 that the fishery began to experience a decline, with landings only accounting for 9% of the U.S. landings.

5.5.1.6.1.2 Tuna Fishery

The tuna fishery depends on herring as one bait source utilized for capturing tuna, and is known to feed on herring as well (Section 5.1.5.2). The tuna fishery itself landed an average of 49,908 thousand pounds of total tuna between the years 2004 and 2008, with the majority of catch being comprised of Albacore, Bigeye, and Yellowfin tuna. The importance of the tuna fishery to the US in 2009 can be seen in Table 87. A total of over 199 thousand metric tons was caught by commercial vessels in and out of US waters, which represents 267,777 thousand dollars' worth of tuna. The percentage of tuna caught within the 200 mile EEZ is a little under 11%, or 68,185 thousand dollars. The US canned 167.5 thousand metric tons of tuna, without accounting for tuna canned in oil, in 2009.

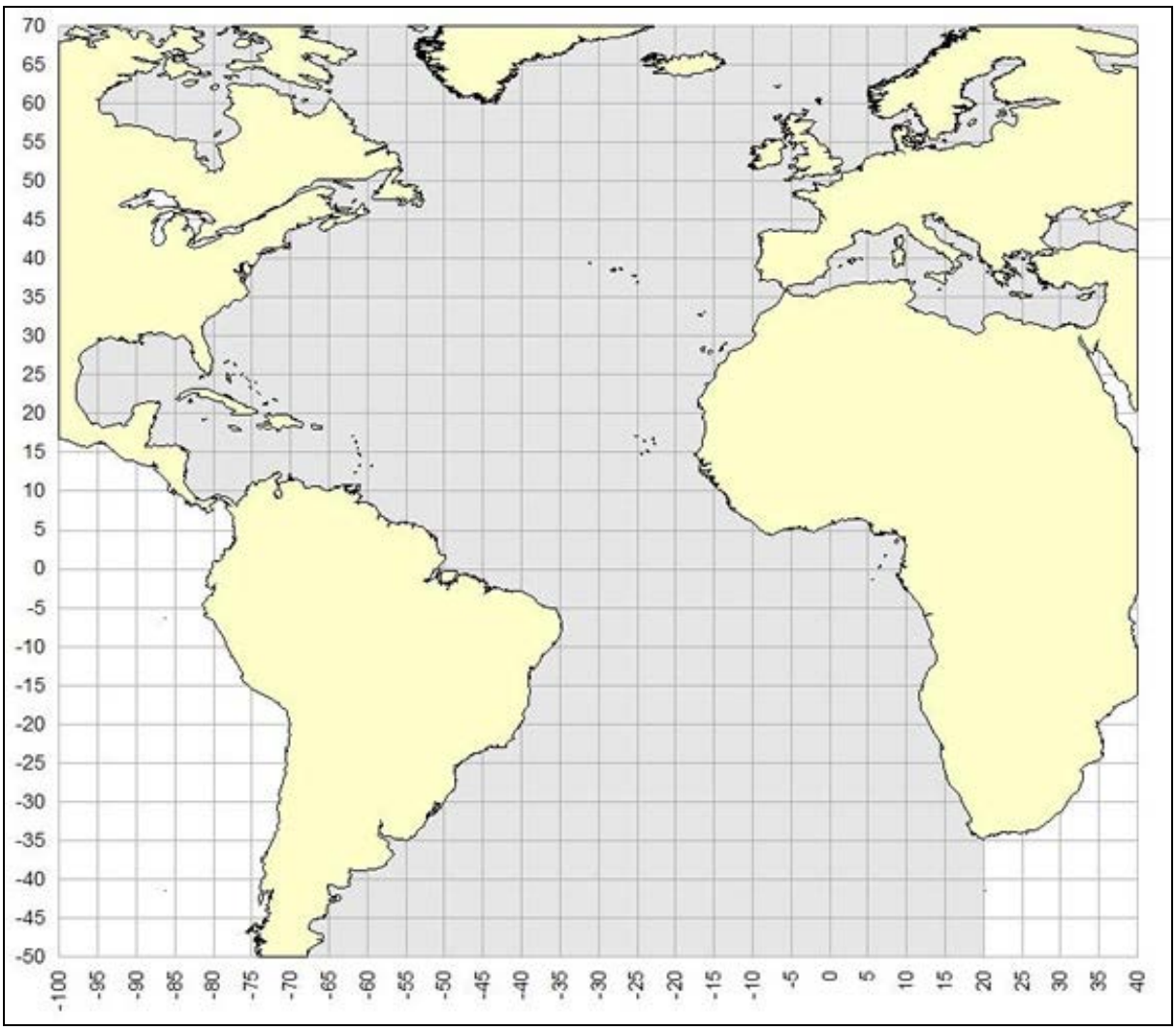
Table 87 Commercial Landings of Total Tuna by Location, 2009

	0 to 3 miles from US shores	3 to 200 miles from US shores	High Seas or off foreign Shores	Total US Landings
Metric Tons	526	18,024	180,682	199,232
Thousands of Dollars	1,065	67,120	199,592	267,777

Source: Fisheries of the United States (2009)
Total tuna includes Albacore, Bigeye, Bluefin, Little tunny, Skipjack, Yellowfin, and Unclassified tuna.

Tuna in the US are jointly managed by NOAA and the International Commission for the Conservation of Atlantic Tunas (ICCAT) in the Atlantic Ocean and adjacent seas. The following information has been obtained from the ICCAT website, http://www.iccat.es/en/introduction.htm, and further information can be found therein. The Convention entered formally into force in 1969, and has three official languages: English, French and Spanish. There are 48 Contracting Parties, including the US, Canada, and various other nations from the UN , Africa, and Asia. The study and management of tuna and tuna-like species can only be undertaken by ICCAT, in accordance with the Convention ICCAT also compiles bycatch information caught during tuna fishing in the Convention area. Figure 74 illustrates the ICCAT Convention area.

Figure 74 The International Commission for the Conservation of Atlantic Tunas (ICCAT) Convention Area



Source: www.iccat.es

There are over 30 species of tuna managed ICCAT, including: Atlantic bluefin (*Thunnus thynnus thynnus*), skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), albacore (*Thunnus alalunga*) and bigeye tuna (*Thunnus obesus*); swordfish (*Xiphias gladius*); billfishes such as white marlin (*Tetrapturus albidus*), blue marlin (*Makaira nigricans*), sailfish (*Istiophorus albicans*) and spearfish (*Tetrapturus pfluegeri*); mackerels such as spotted Spanish mackerel (*Scomberomorus maculatus*) and king mackerel (*Scomberomorus cavalla*); and, small tunas like black skipjack (*Euthynnus alletteratus*), frigate tuna (*Auxis thazard*), and Atlantic bonito (*Sarda sarda*).

Six main species are caught by US fisheries; Albacore, Bigeye, Bluefin, Little Tunny, Skipjack, and Yellowfin, and all seem to be experiencing a downward trend in stock size as fishery effort has increased. Similarly, all 6 have been experiencing difficulty in producing a stock assessment that does not suffer from uncertainty due to lack of data. According to the North Atlantic 2009 ICCAT Albacore stock assessment, the spawning stock size had declined in 2007 to one third of the peak levels that were estimated in the late 1940s. The Committee further concluded that it is likely that the stock was below the maximum sustainable yield (MSY) level and the stock had remained below B_{MSY} since the late 1960s.

The 2010 Bigeye tuna assessment showed a slightly similar trend, but the Committee noted that while data quality continued to improve, considerable uncertainty in the stock status and productivity of the Bigeye still exist. Large declines in biomass and increases in mortality were evident, particularly in the 1990's, when fishing mortality was high. With the decline in the previous five or six years, there have been possible biomass increases, and replacement yield for 2011 was estimated to be at around MSY.

The Atlantic Bluefin 2010 ICCAT stock assessment was limited by a lack of data, and the Committee noted that historical fishery performance data would likely not be improved, and that therefore the assessment should be modified in future iterations. A similar trend to the two previous tuna was found, however, with spawning stock biomass declining since the 1970's, with increasing fishing pressure on age 2-5 fish. Older ages felt a decrease in fishing effort but a rapid increase in the 1990's, and recent recruitment levels remain uncertain. The Little tunny is such a data poor species that ICCAT has not performed a stock assessment on it or its 12 other small tuna species that it is lumped with.

The last ICCAT stock assessment for skipjack tuna was created in 2008, although another may occur in 2012. Skipjack is a typically tropical or sub-tropical species that exhibit continuous spawning and differences in growth by region. Making assessments even more difficult, the effort on the skipjack is not directed, and so data is variable. Conclusions for both the Eastern and Western stock were therefore difficult to create, but it was generally thought that neither was suffering from over exploitation.

For Yellowtail tuna, the last stock assessment was also in 2008, with another scheduled to take place in 2010. Between the age structured and production model, results varied. The age structured model suggested that overfishing had occurred in recent years, and the production model suggested that overfishing had been occurring and that the stock was overfished during those years. Both models indicated that overfishing was not occurring in 2006, however, the Committee urged consideration of uncertainty in both models.

5.5.1.6.1.3 Recreational Fisheries/Other

Of the many recreational fisheries that exist in the Northeast, several depend on herring as a source of bait as well as a source of food for the fish that they hunt (Section 5.1.5). The following review of recreational fisheries comes from the fisheries of the United States, which offers a comprehensive overview of recreational fisheries in the US. A full breakdown of the different recreationally fished species by year and weight is offered therein, as well as by distance from shore and by number of live releases.

The recreational fisheries serve many purposes for the residents of the Atlantic Coast states. In 2009 there were close to 44 million trips that caught over 198 million fish, trips which serviced nearly 6.4 million residents. Over 31% of those trips were made in the waters managed by the NEFMC. Commonly caught fish on the trips that occurred in federally managed waters include black sea bass, summer flounder, Atlantic cod, dolphinfish, and bluefish. 62% of all the prior mentioned trips were ones in which the fishing was done mostly in inland waters.

States stand to benefit from recreational activity as well. In 2009, the state of New Jersey, New York, and Massachusetts had the most number of angler trips, with 5,444 trips; 4,917 trips, and 3,603 trips, respectively. Connecticut had 1,462 trips; while Maine had 1,014, and Rhode Island 1,042. The state of New Hampshire had the fewest, with 414 trips. The numbers of trips taken in 2008 were similar in magnitude by state. The trend in states is similarly mimicked in the number of finfish both harvested and released by recreational fishermen in 2008 and 2009, however Connecticut was much closer in ranking to Massachusetts.

Due to the eclectic nature of the fisheries entailed in the recreational community there is no one management body that oversees all recreational fisheries. Instead, there is a mixture of management from the NMFS, NEFMC, MAFMC, ASMFC, and state agencies that are not divided by the value of the resource. For instance, some stocks such as black sea bass are managed by the ASMFC and represent 1,022 mt of harvest in 2008 and 1,269 mt in 2009. Atlantic cod, however, are managed under the NEFMCs Groundfish FMP, and represent 1,905 mt of recreational catch in 2008 and 1,677 mt in 2009. The MAFMC manages bluefish, which were worth 8,717 mt of recreational catch in 2008 and 6,290 mt in 2009. There are a wide range of bodies that assess the health and status of the stocks that are recreationally fished as well. For more information on a specific recreational species, determine the management body that oversees the species and refer to their staff and website.

There are multiple forms of data on recreational fisheries available. For the Fisheries of the United States (2009), the data was gathered through state and regional logbook programs, a coastal household telephone survey, a telephone survey of for-hire fishing vessel operators, and a field intercept survey of completed angler fishing trips. Amendment 16 to the Groundfish FMP utilized data that came from the Marine Recreational Information Program (MRIP, formerly the MRFSS) and recreational party/charter logbook data. The party/charter mode logbook data can be used to characterize numbers of participating vessels, trips, and passengers.

The MRIP provides a source for catch statistics including harvested and released catch, distance from shore, size distribution of harvested catch, catch class (numbers of fish per angler trip), and seasonal distribution of harvested catch. The MRIP is a relatively new initiative from NMFS which is focused on counting and reporting marine recreational catch and effort. The point of MRIP is to provide the detailed, timely, scientifically sound estimates that fisheries managers, stock assessors and marine scientists need to ensure the sustainability of ocean resources, as well as address head-on stakeholder concerns about the reliability and credibility of recreational fishing catch and effort estimates.

5.5.1.6.2 Bait Dealers

5.5.1.6.2.1 Beaver Enterprises Inc. (Rockland, ME))

Two years ago, Beaver Enterprises Inc., founded in 1975, sold their plant to Linda Bean, a lobster dealer. Beaver is no longer in the lobster bait business, but instead focuses on selling salt to herring operations all over the region including in Rockland and Kittery, ME, Gloucester, MA and Rhode Island. The salt business is easier than the herring business because salt "keeps" whereas herring deteriorates quickly.

Beaver is probably the largest salt purveyor in the region for the fishing industry. The owner started small but was able to grow large enough quickly enough to develop "buying power". He buys directly from the three largest producers, Morton, Cargill's and US Salt. Beaver Enterprises averages deliveries of 2 trailer-truck loads per day of salt.

Without herring, Beaver Enterprises would be out of business. Herring fishermen have always salted their product. Typically, of 400 pounds of barreled herring, 80 pounds is salt (i.e., 20% of herring bait weight is salt). The ASMFC landing days restrictions has increased salt demand.

The cost of overhead is higher than it was in the past with the need for cold storage, plus bait is more expensive, as is the cost of fuel. It is harder for the "little guys," who used to be able to make a day's pay with one truckload of fish, for example.

Beaver Enterprises does do some fish hauling. For example, they recently transported a ton of pogies (22 vats) from Lund's (Cape May, NJ) to O'Hara's (Rockland, ME), spending $1000 in fuel. (Wayne Stinson 2011, personal communication)

5.5.1.6.2.2 Channel Fish (Boston, MA)

Channel Fish is located in East Boston and was incorporated in 1963. The company operates a processing plant that deals mainly in gurry/offal that is bought, ground, frozen and sold to cat food companies. Channel Fish also buys herring and sells bait to lobster dealers and lobstermen, though the majority goes to dealers. In the past, they were more heavily involved in the herring fishery but currently a smaller percentage of their business is associated with or dependent on herring. Herring is purchased from a number of different vessels including midwater trawlers and some seiners. They own five trucks and buy herring from Rockland, Portland, Gloucester and New Bedford as the boats follow the migration of the fish. The company has a pier, pump-out facility and dewatering box, so anticipates having vessels land at their facility in the near future.

When it is available, the company also handles mackerel that is packaged and frozen for human consumption. Menhaden, primarily from New Jersey, is also purchases and sold for use as a baitfish. Product is sold domestically and internationally. Channel Fish has approximately 60 full-time, year-round employees. Though the company rarely attends Management Council meetings, they communicate with Council and Herring Committee members on a regular basis.

(Updated 8/26/11, personal communication.)

5.5.1.6.2.3 Port Clyde Lobster (Port Clyde, ME)

In 2007 Linda Bean purchased Bay Lobster Company, renaming it Port Clyde Lobster. Trained by the prior owner, Linda's company bought 400,000 pounds of lobster in the first year. The following year, Ms. Bean bought 1 million pounds of lobsters from a supplier on Vinalhaven. She also invested in a small, unique lobster processing plant in Richmond (Sagadahoc County) and in 2009, bought a 28,000 sq. ft. seafood processing plant in Rockland that she converted to a lobster processing facility.

The value-added product she has developed includes lobster stew and an herbed lobster roll (sold at summer stands in Freeport and Rockland, from a lobstermobile at five Maine state fairs, five "Perfect Maine" cafes in Freeport, Camden, Portland (Maine), Del Ray Beach, Florida and St. Thomas (US Virgin Islands). In addition, a takeout on Nantasket Beach, Massachusetts, was licensed).

In 2010 Bean bought Inland Seafoods of Atlanta's wharf and business on Vinalhaven and purchased a total of 3.1 million pounds of lobster. Wal-Mart also began to sell Bean's first frozen seafood product: cooked, in-shell cocktail claws, frozen and pre-scored for easy shell removal, produced by the Rockland plant.

Bean's company tags their lobsters to identify the dock from which they were purchased. Along with two others, Ms. Bean established the Fund for the Advancement of Sustainable Maine Lobster to help pay for Marine Stewardship Council's certification of Maine lobster as sustainable.

In 2011, the company introduced additional value-added lobster products, has begun to process Maine shrimp in the winter and has branched out to selling other unique Maine products, as well as expanded licensing to new locations.

The company employs over 200. Part of the company's responsibilities includes purchasing bait and fuel to sell to the lobstermen who provide lobsters to the business.

5.5.1.6.2.4 Purse Line Bait (Sebasco Estates, ME)

Purse Line Bait has been trucking and barreling lobster bait since approximately 1993. Herring is purchased from both seiners and trawlers in Maine and Massachusetts, pogies from New Jersey, redfish and other species from around New England. The fish is trucked to their main facility in Sebasco Estates, ME where it is salted and barreled, then sold to approximately 40 lobster buyers in the region between Harpswell, ME and Rockland, ME. Purse Line has two freezer facilities, one in Sebasco and another in Harpswell, where about 2 million pounds of product can be stored for the times when no product is coming in. Americold Cold Storage in Portland, ME is used for overflow.

Eighty-five percent of their sales are to lobster buyers with the remaining percent sold off dump trucks. Of an approximate total of 20 million pounds in overall sales per year, 12 million are herring, 5 million are pogies and 3 million are redfish and other species.

In addition to purchasing from the vessels, Purse Line Bait also purchases herring from Cape Seafoods in Gloucester, MA, O'Hara in Rockland, ME and from other sources. Purse Line Bait owns 10 trucks, employs approximately 8 or 9 people full-time, year around and 4 or 5 more seasonally.

(Updated 6/17/11)

5.5.1.6.2.5 Sunshine Seafoods (Stonington, ME)

Sunshine Seafoods, Inc. operated for approximately 20 years out of Stonington, Maine. It was primarily a lobster dealer, buying and selling lobster in the U.S. and abroad. The business was sold, but probably due to the economic crash, went bankrupt and the original owners reopened as Sunshine Seafoods LLC.

Currently a small fraction (about 5%) of its business comes from sales to the Maine tourist market that typically runs from May to December. The majority of its business is dependent on lobster sales to Canada. Sunshine Seafoods also deals in bait herring, buying wholesale from a local dealer or occasionally directly from a herring vessel. About 5% of its business is derived from sales of herring for lobster bait largely to the same lobstermen who sell them lobsters. Sunshine Seafoods employs one person year-round.

(Updated 8/26/11, personal communication)

5.5.1.6.3 Non-Consumptive Utilization (Whale Watching and Other Ecotourism)

The effect of herring as a forage species on whales and other marine mammals and birds in the New England area is a key issue for non-consumptive utilization of Atlantic herring, and therefore the whale watching and bird watching industry. If fewer marine mammals or birds are in the area to observe, fewer boats and tours will be able to be supported in the industry. Furthermore, whales and some sea birds are known to respond to prey availability, and may become increasingly difficult to find. The number of marine mammals needed to support the industry is unknown, but economic data on the whale watching industry does exist.

An economic study by O'Conner *et al* (2009) characterized the whale watching industry in New England as being worth $30 million (revenue/year), with a growth rate of -3% a year (Table 88). Over 1 million people a year are said to go on trips, and the number of operators is around 30 (although it is not clear if charter vessels are included in the estimate). Main ports of sail include Massachusetts, Maine, New Hampshire and Rhode Island, and Stellwagen Bank National Marine Sanctuaries is one of the more popular destinations. Ticket prices are around $40 for adults and $30 for children on a 4 hour cruise. Up to 400 passengers can fit on some vessels.

Table 88 Summary of New England Whale Watching Statistics, 1998 and 2008

Year	Number of whale watchers	AAGR	Number of operators	Direct expenditure	Indirect expenditure	Total expenditure
1998	1,240,000	N/A	36	$30,600,000	$76,650,000	$107,250,000
2008	910,071	-3%	31	$35,000,000	$91,000,000	$126,000,000

Source: O'Conner et al (2009)

An economic study by Lee (2009) noted that the industry runs through the late spring to the early fall, with fin, humpback, and minke whales being the most commonly sighted. Whales tend to congregate on large oceanographic features, which is where schooling fish can be found. A good portion of a whale watching trip involves finding the whales, which results in spent fuel. If schools of herring were to stop schooling or reduce in number and whales were to subsequently stop congregating, the whale watching industry could be affected by the extra expenditure of fuel to find them, even if whales are present in the area.

5.5.2 Canadian Herring Fisheries

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. Previously the Herring FMP assumed that 20,000 mt of fish from the inshore component of the Atlantic herring resource was taken annually from the NB weir fishery. In the most recent Atlantic Herring Specifications Package for 2009-2012, which facilitated transition to an ACL/AM framework mandated by the reauthorized MSA with Amendment 4 to the Herring FMP, 14,800 mt was deducted from the ABC to account for potential catch of Atlantic herring in the NB weir fishery.

The language in Amendments 1 and 4 provides the flexibility to reconsider the assumption of Canadian catch and adjust according to trends in the fishery as a part of the specifications package. The new, lower deduction was based on recent trends in catch and represented the average 2+ landings from 1999-2008 when eliminating the highest year of the time series – 2007 – and the lowest year of the time series – 2008. The 2+ catch was selected for consistency with the TRAC assessment, which is based on 2+ biomass only, and the average was chosen because the mean represents the average expected value over the time series; moreover the 2009 NB weir catch at the time (through September 28, 2009) was about 3,143 mt and the mean 2+ catch from the NB weir fishery from 1995-2008 was 16,300 mt.

The 2010-2012 fishery specifications package also implemented a new provision that allocated an additional 3,000 mt of herring to Area 1A in November for the remainder of the fishing year based on the level of catch in the New Brunswick (NB) weir fishery. In the provision, NMFS is to monitor the 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 2 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 is to 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 was implemented to provide 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. In 2010 the he 9,000 mt limit was exceeded in the NB weir fishery, and subsequently Area 1A did not receive the additional allocation. The additional allocation was received in 2011, however.

Table 89 shows the landings from all Canadian fisheries from 1963-2010, including the "Non-Stock 4Xs N.B. Weir and Shutoff" landings, which generally represents the catch from the NB weir fishery. For the most part shutoffs are not located in the same areas as weirs, and landings from shutoffs are through to be from the 4WX stock component. Landings range from the highest of 44,112 tons, which occurred in 1989 to the lowest of 4,031 tons, which occurred in 2009. Landings since 1990 vary widely, with peaks in 1990 at 38,778 tons, 1997 and 1998 around 20,000 tons, and 2007 at 30,944 tons. Troughs in landings occurred in 1996, which had landings of 15,913 tons and 2003 had landings of 9,003 tons.

Table 89 Historical Series of Annual Landings (t) by Major Gear Components and Seasons of the 4WX Herring Fishery, 1963-2010

Year^	4W Winter Purse Seine	4Xs Fall&Winter Purse Seine	4Xqr Summer Purse Seine	4X Summer Gillnet	4Xr Nova Scotia Weir	4WX Stock Nominal Landings	4WX Stock Adjusted Landings*	4WX Stock TAC	Non-Stock 4Xs N.B. Weir & Shutoff	4VWX Coastal Nova Scotia	Offshore Scotian Shelf Banks	Total 4VWX Adjusted Landings
1963		6,871	15,093	2,955	5,345	30,264	30,264		29,366		3,000	62,630
1964		15991	24,894	4,053	12,458	57,396	57,396		29,432		2,000	88,828
1965		15,755	54,527	4,091	12,021	86,394	86,394		33,346		6,000	125,740
1966		25,645	112,457	4,413	7,711	150,226	150,226		35,805		2,000	188,031
1967		20,888	117,382	5,398	12,475	156,143	156,741		30,032		1,000	187,773
1968		42,223	133,267	5,884	12,571	193,945	196,362		33,145		18,000	247,507
1969	25,112	13,202	84,525	3,474	10,744	137,057	150,462		26,539		121,000	298,001
1970	27,107	14,749	74,849	5,019	11,706	133,430	190,382		15,840		87,000	293,222
1971	52,535	4,868	35,071	4,607	8,081	105,162	129,101		12,660		28,000	169,761
1972	25,656	32,174	61,158	3,789	6,766	129,543	153,449		32,699		21,000	207,148
1973	8,348	27,322	36,618	5,205	12,492	89,985	122,687		19,935		14,000	156,622
1974	27,044	10,563	76,859	4,285	6,436	125,187	149,670		20,602			170,272
1975	27,030	1,152	79,605	4,995	7,404	120,186	143,897		30,819			174,716
1976	37,196	746	58,395	8,322	5,959	110,618	115,178		29,206			144,384
1977	23,251	1,236	68,538	18,523	5,213	116,761	117,171	109,000	23,487			140,658
1978	17,274	6,519	57,973	6,059	8,057	95,882	114,000	110,000	38,842			152,842
1979	14,073	3,839	25,265	4,363	9,307	56,847	77,500	99,000	37,828			115,328
1980	8,958	1,443	44,986	19,804	2,383	77,574	107,000	65,000	13,525			120,525
1981	18,588	1,368	53,799	11,985	1,966	87,706	137,000	100,000	19,080			156,080
1982	12,275	103	64,344	6,799	1,212	84,733	105,800	80,200	25,963			131,763
1983	8,226	2,157	63,379	8,762	918	83,442	117,400	82,000	11,383			128,783
1984	6,336	5,683	58,354	4,490	2,684	77,547	135,900	80,000	8,698			144,598
1985	8,751	5,419	87,167	5,584	4,062	110,983	165,000	125,000	27,863			192,863
1986	8,414	3,365	56,139	3,533	1,958	73,409	100,000	97,600	27,883			127,883
1987	8,780	5,139	77,706	2,289	6,786	100,700	147,100	126,500	27,320			174,420
1988	8,503	7,876	98,371	695	7,518	124,653	199,600	151,200	33,421			233,021
1989	6,169	5,896	68,089	95	3,308	83,557	97,500	151,200	44,112			141,612
1990	8,316	10,705	77,545	243	4,049	102,627	172,900	151,200	38,778			211,678
1991	17,878	2,024	73,619	538	1,498	97,010	130,800	151,200	24,576			155,376
1992	14,310	1,298	80,807	395	2,227	100,227	136,000	125,000	31,967			167,967
1993	10,731	2,376	81,478	556	2,662	98,464	105,089	151,200	31,573			136,662
1994	9,872	3,174	64,509	339	2,045	80,099	80,099	151,200	22,241			102,340
1995	3,191	7,235	48,481	302	3,049	62,499	62,499	80,000	18,248			80,747
1996	2,049	3,305	42,708	6,340	3,476	58,068	58,068	57,000	15,913	1,450	11,745	87,176
1997	1,759	2,926	40,357	6,816	4,019	56,117	56,117	57,000	20,552	2,340	20,261	99,270
1998	1,405	1,494	67,433	2,231	4,464	77,027	77,027	90,000	20,091	4,120	5,591	106,829
1999	1,235	4,764	64,432	1,660	5,461	77,552	77,552	105,000	18,644	5,618	12,646	114,460
2000	1,012	4,738	78,010	823	701	85,284	85,284	100,000	16,829	4,283	2,182	108,578
2001	0	4,001	62,004	1,857	3,708	71,570	71,570	78,000	20,209	6,006	12,503	110,288
2002	367	5,257	69,894	393	1,143	77,054	77,054	78,000	11,874	10,375	7,039	106,342
2003	0	8,860	79,140	439	921	89,360	89,360	93,000	9,003	9,162	998	108,523
2004	0	5,659	69,015	225	3,130	78,029	78,029	83,000	20,686	6,924	4,165	109,804
2005	0	2,601	43,487	566	2,245	48,899	48,899	50,000	13,055	6,311	5,263	73,528
2006	0	930	45,002	719	2,508	49,159	49,159	50,000	12,863	6,566	9,809	78,397
2007	0	1,847	46,045	1,334	1,130	50,356	50,356	50,000	30,944	5,240	5,385	91,925
2008	0	2,000	50,022	15	2,524	54,561	54,561	55,000	6,447	3,704	918	65,631
2009	0	2,807	50,802	117	387	54,113	54,113	55,000	4,031	9,783	9,088	77,015
2010	0	2,787	41,345	204	1,198	45,534	45,534	55,000	10,958	5,575	11,862	73,929

^Annual landings by purse seiners are defined for the period from October 15 of the preceding year to October 14 of the current year.

*Adjusted totals includes misreporting adjustments for 1978-84 (Mace 1985) and for 1985-93 (Stephenson 1993, Stephenson et al 1994)

All landings by other gear types are for the calendar year.

Source: Canadian DFO, 1963-73 Offshore Scotian Shelf landings from Stephenson et al. (1987)

The overall trend in landings since 1990 has been downward (Table 89), and landings from 2000 have dropped from 20,209 mt in 2001 to 4,031 mt in 2009, but increased in 2010 back to 10,958 mt. The same trend can also be seen in the NB weir landings, which are presented separately in Table 90 on the following page, from 1964 to 2011.

- 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 90).

Table 91 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 92 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 Table 92 (2008-2010) also coincide with the reduced level of effort seen in Table 91.

Table 90 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 91 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 92 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)

5.5.3 Communities

5.5.3.1 Communities Introduction and Background

This section summarizes available fishery, social, economic, and cultural information about *communities of interest* for Amendment 5 to the Herring FMP – that is, communities most engaged in the herring fishery that may be affected by the Amendment 5 management measures. Information contained in this section is useful for assessing the economic, social, and community impacts of the Amendment 5 management measures and helps to meet the Council's legal requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the National Environmental Policy Act (NEPA) as well as other applicable laws.

NEPA requires Federal agencies to consider the interactions of natural and human environments, and the impacts on both systems of any changes due to governmental activities or policies. This consideration is to be done through the use of "a systematic, interdisciplinary approach, which will ensure the integrated use of the natural and social sciences ... in planning and decision-making," [NEPA section 102(2)(a)]. Unquantified environmental amenities and values must be considered and weighed on par with technical and economic considerations. Unquantified amenities and values include such factors as angler satisfaction, job satisfaction and an independent life-style for commercial fishermen, and the opportunity to see species, such as salmon, in the wild for the non-consumptive user of marine fishery resources. Technical considerations include the management of fishing gears and enforceability of regulations.

NEPA specifies that the term "*human environment*" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment [40 CFR 1508.14]. When analyses predict that a fishery management action or policy will have a significant effect on the human environment, a detailed Environmental Impact Statement (EIS), including results of various analyses, must be prepared. The Herring Amendment 5 development process consequently requires the development of an EIS.

The MSA has reflected the NEPA approach in the National Standards for fishery management. The "prohibition on overfishing" standard (NS1), "use of best available scientific information" standard (NS2), and the "fair and equitable allocation" standard (NS4) are examples of this. Where a "system for limiting access to the fishery in order to achieve optimum yield" [MSA section 303(b)(6)] is deemed necessary, the MSA requires the Secretary of Commerce and the Council to consider in depth the economic and social impacts of the system. In 1990, the MSA was amended further and required that an FMP must assess, specify, and describe the likely effects of conservation and management measures on participants in the affected fishery, and the effects on participants in other fisheries that may be affected directly or indirectly [MSA section 303(a)(9)].

In the 1996 amendments to the MSA, Congress added provisions directly related to social and economic factors for consideration by Councils and NMFS. National Standard 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.**

National Standard 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."*

Current guidance on National Standard 8 defines a community as a town or city, a geographic unit that might fit the Census Bureau's definition of a "place." It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other fishing communities in the region. For the purposes of consistency, however, the communities that are described and assessed in this amendment are place-based (cities and towns).

In terms of the terms "substantially dependent" and "substantially engaged," some have suggested, for example, that "substantial dependence" be measured in terms similar to the US Department of Agriculture's criteria for determining whether rural communities are dependent on agriculture or logging. The Economic Research Service of the USDA, for example, classifies counties as "farming dependent" based on a certain percentage of economic activity (labor and proprietor income). Some of the sources of data to consider in making determinations of fishing dependence are thus supplied in current guidance, such as landings information or numbers of participants, and the sociocultural importance of the fishery. With respect to determining whether a community is "substantially engaged" in the harvesting or processing of a fishery, existing guidance does not provide clear criteria. While the application of a percentage of economic income activity may be one appropriate way to determine "substantial dependence," there may be other valid criteria. For example, criteria for "substantial dependence" could be based on a minimum level of activity (landings, vessels, etc.), the presence of a particular type of infrastructure (processing facilities, auctions, State fish piers, etc.), and/or a level of fishing activity (revenues, time spent fishing, etc.) (See Amendment 13 to the Northeast Multispecies FMP for additional discussion). The approach used in this document to identify fishing communities that are "substantially engaged" in fishing, particularly in the herring fishery, utilizes these additional criteria.

Herring 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, 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 National Standard 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.

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.

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. "Sustained participation" is interpreted as continued access to the fishery within the constraints of the condition of the resource.

In summary, a full range of impact assessments – ecological, economic, and social – are necessary not only to meet MSFCMA and NEPA requirements, but also to improve the Council's decision-making process.

5.5.3.2 Amendment 5 Communities of Interest

The purpose of identifying *communities of interest* is to ensure that more thorough consideration is given to the potential impacts on those communities, which are *most* involved in the herring fishery and/or most important to the operation of the herring fishery as a whole. This helps the Council to better meet the requirements of NEPA as well as National Standard 8 to the MSFCMA. Note that some communities have been grouped together to acknowledge geographic proximity as well as similarities in terms of participation in and dependence on the herring fishery.

Unlike some other fisheries in the region (multispecies, for example), the herring fishery is a smaller, more discrete fishery whose participating vessels and communities are easier to identify. *Communities of Interest* for Amendment 1 to the Herring FMP were selected because they meet at least one (and more than one in most cases) of the following five criteria:

1. **Atlantic herring landings averaging at least 10,000,000 pounds (4,536 mt) per year from 1997-2008, or anticipated landings above this level based on interviews and documented fishery-related developments.**

When this criterion was selected for Amendment 1, landings of 10,000,000 pounds (4,536 mt) in a year indicated a relatively substantial degree of participation in the herring fishery, since 10,000,000 pounds equated to 7.5% of the Area 1A and 3 TACs; 45.4% of the Area 1B TAC; and 9% of the Area 2 TAC.

With lower ACLs associated with Amendment 5, 10,000,000 pounds equates to 17% of Area 1A's ACL; 100% of the Area 1B's ACL; 20% of the Area 2's ACL; and 12% of Area 3's ACL. Only five ports or port clusters in the region landed over 120,000,000 pounds in the 12 years: Gloucester and New Bedford in Massachusetts; Portland and Rockland in Maine; and the southern Rhode Island ports (Narragansett, Newport and North Kingston).

When The FSEIS for Amendment 1 was written, the criteria anticipated potentially higher landings because shoreside facilities for the Atlantic herring fishery were considered "developing" in some areas. Shoreside processing plants had opened in Gloucester and New Bedford that had capacity for receiving and processing large volumes of herring and other pelagic species. The development of these two facilities and the potential to increase landings in the communities where these facilities were located was recognized.

Landings data alone, however, are not adequate to identify all of the communities that are engaged in the herring fishery. Because the fishery is a high-volume fishery, the most active participating vessels are relatively large, and many vessels come into port "loaded down" with herring. When landing large volumes of fish, herring vessels generally require larger, deep-water ports to ensure that they can land

safely without running aground. Consequently, large volumes of herring landings tend to be concentrated in a relatively small number of ports.

A transportation network is essential for distributing herring throughout the region from herring vessels to processing facilities, bait facilities, and lobster vessels, all of which are engaged in and dependent on the herring fishery to varying degrees. In some cases, processing facilities and other infrastructure dependent on herring are located in communities with few or no landings of herring, but these facilities employ many individuals and are important social and economic components of the fishery. As a result, it is necessary to consider criteria other than landings to identify the *communities of interest* in this amendment.

2. Infrastructure dependent in part or whole on Atlantic herring.

Infrastructure for the Atlantic herring fishery includes:

- Shoreside processing facilities for food production (whole frozen);
- Shoreside processing facilities for bait production (salting, etc.);
- At-sea processing facilities (freezer vessels); and
- Trucking and other essential services for distributing fish.

Infrastructure and the opportunity to capitalize on available markets for herring are important elements of the fishery. For the most part, infrastructure in this fishery, whether shoreside or at-sea, is dedicated solely to serving the small pelagic fisheries (herring and mackerel, primarily). Very few elements of the infrastructure are engaged in other fisheries such as multispecies, monkfish, or scallops. The investments that have been made in the infrastructure for the Atlantic herring fishery reflect a long-term commitment to this fishery.

As previously noted, the number of ports that are capable of accommodating large herring vessels that land large volumes of fish is relatively small. A transportation network is essential to ensuring that herring are distributed as rapidly as possible to processing and other facilities. Trucking and transportation services are therefore a critical element of the infrastructure for this fishery.

The last sardine cannery in the U.S. closed in 2010. It had relied on herring for 100% of its operation. For the most part, the whole frozen processing facilities rely on a combination of herring and mackerel for 100% of their operations. No Joint venture (JV) and internal waters processing (IWP) operations at-sea have received quota in the Atlantic herring fishery in recent years.

3. Dependence on herring as lobster and/or tuna bait.

Atlantic herring is important bait for the lobster and tuna fisheries, as well as for other primarily recreational fisheries (striped bass, for example). In fact, herring is the bait of choice in the State of Maine, particularly for their critical lobster fishery. Consequently, consideration of a community's dependence on herring for bait purposes is essential, as any changes to the supply of herring bait in some areas could produce negative impacts across other fisheries such as the lobster and tuna fisheries. In other words, management measures in this amendment that may affect the supply of bait could result in multiplier effects throughout the numerous coastal communities that depend largely on herring bait.

Another consideration related to dependence on herring bait is the importance of herring as a forage fish for many species and the overall role of herring in the ecosystem. Individuals from communities that are dependent on herring for bait have expressed concern about the supply of herring for forage purposes and the need to maintain an adequate amount of herring in the ocean as prey for other valuable (commercial and recreational) species. Including dependence on herring as bait as a criterion for identifying communities of interest in this amendment provides an opportunity to consider the importance of herring as forage as well as any social and community impacts related to this issue.

While it is not feasible to identify every community that depends on herring for bait as a *community of interest* in Amendment 5, several communities were identified based on an exceptionally high degree of dependence on herring for bait. Assessment of the impacts of the Amendment 5 measures on these selected communities provides context to understand the potential impacts on any community that depends on herring for bait. Parallels can be drawn between the communities that are identified in this section and other similar communities engaged in the lobster, tuna, striped bass, and other recreational fisheries.

4. Geographic isolation in combination with some level of dependence on the Atlantic herring fishery.

Geographic isolation is an important consideration for communities that exhibit dependence on the Atlantic herring fishery. In general, dependence on fishing and opportunities to seek alternatives to fishing decrease as the geographic isolation of a community increases. The isolation of some coastal communities (those in Downeast Maine, for example) has clearly contributed to the dependence of these communities on the marine environment. Communities that are more geographically isolated and dependent on herring in some way may proportionately be more affected by management measures that decrease the supply of herring or opportunities in the fishery. Since transportation is such an important element of the herring fishery, the lack of major thoroughfare in geographically isolated communities may exacerbate problems associated with changes in supply and opportunities in the fishery.

5. Utilization of Atlantic herring for value-added production.

Since the closing of the sardine cannery in Prospect Harbor in 2010 and the sale of Engelhard Corporation in Eastport that had processed herring scales for pearl essence, there is currently no value-added production associated with herring. In the future, processing herring for pickling or other products for specialty markets is feasible. As the FEIS for Amendment One noted, value-added production suggests that a facility may have invested in niche or specialty markets for the fishery, which may be more sensitive to changes in supply. Reports on the closing of the cannery in Prospect Harbor suggest that this is the case (Seelye, 2010).

Based on the five criteria described above, the following *communities of interest* are identified for the purposes of analysis in this amendment:

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**

Profiles of these communities, including important demographic and social information, are provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. In some cases, the groups of communities identified above have been disaggregated so that information specific to certain communities can be provided and so that important details about individual communities are not lost.

5.5.3.2.1 Portland, Maine

A detailed profile of Portland, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Portland's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

One of the most important fishing associations in Portland is the Portland Fish Exchange. Opened in 1986, it was the first display fish auction in the United States. According to the Fish Exchange website, it offloads and auctions approximately 90% of Maine's annual regulated groundfish catch (Portland Fish Exchange, 2011). Currently the auction receives landings in the mornings and auctions the fish at eleven on Sunday and at noon, Monday through Thursday. In addition, it holds an evening auction in the winter for Northern shrimp.

Other fishing associations in Portland include Maine Urchin Harvesters Association and the Associated Fisheries of Maine (AFM).

Other Fishing-Related Institutions

Coastal Enterprises Inc. (CEI) is a private, nonprofit Community Development Corporation and Community Development Financial Institution. The goal of CEI's Fisheries and Working Waterfront Programs is to foster the sustainable development of Maine's fisheries and fishing communities by making investments, initiating projects, supporting policies and assisting marine-related enterprises with goals that encompass the economy, the environment and equity (Coastal Enterprises, Inc, 2011).

Gulf of Maine Research Institute (GMRI) is a non-profit marine science center located in Portland. Their "work strengthens five essential elements that define an enduring relationship with the ocean: healthy ecosystem, sustainable industries, vibrant communities, abundant opportunities and inspired children." (GMRI, 2011)

Seafarers Friend is a non-denominational Christian organization that assists fishermen and other seafarers at three New England ports: Boston, Portsmouth, and Portland (for more information visit www.seafarersfriend.org). They also visit ships in Salem, MA and soon Searsport, ME. The Maine Fishermen's Monument Commission has a website to expand fundraising for a monument honoring Maine's commercial fishing heritage (www.mainefisermensmonument.com, 2011).

Physical

The city of Portland has infrastructure that provides full access to and within the city. Portland has its own international airport, and it has several transportation options within and to the city. Amtrak, public buses, and interstate and state highway systems provide public access to the city. Public transit within the city includes a bus and a streetcar system.

Commercial

Portland's landings come primarily from the large mesh groundfish species and from lobster. In 2009, 37.3 million pounds were landed with a value of $16.6 million, a decrease in value from 2008 when 35.1 million pounds were landed with a value of $22.6 million.

Several facilities in Portland process lobsters including Cozy Harbor Seafood, Inc. (For more information visit website at http://www.cozyharbor.com), and Inland Seafood that buys 7 to 9 million pounds of lobster annually (Mainebiz, 2011).

In 2002, there were a total of 500 moorings, berthings, slips, and tie-ups for commercial and recreational fishermen, of which 30% were used by commercial fishermen in Bath. A 2002 report on Working Waterfronts in Maine recorded 271 commercial harvesters. At the time, Portland had 22 commercial private and public waterfront facilities, of which nine are dedicated to commercial fishing use. Retention of commercial fishing access is considered a challenge, with development pressures, increased competition from tourism/recreational use, and deterioration of infrastructure reported as threats to the commercial fishing access (CEI, 2002).

Both the number of vessels home-ported and number of vessels registered with owner's living in Portland slightly decreased between 1997 and 2003. The dollar value of landings remained relatively stable, while the level of fishing by landed port in Portland significantly dropped in 2003 relative to the six years prior.

Landings by Species

Table 93 Portland Dollar Value by Species 1997-2008

	Annual Average 1997-2008	2002 only
Largemesh*	$14,367,294	15,517,209
Lobster	$13,377,239	17,014,768
Monkfish	$4,465,720	4,990,587
Other	$235,234	795,540
Herring	$3,069,730	1,968,563
Scallops	$63,209	36,073
Smallmesh**	$38,087	9,685
Skates	$38,919	53,516
Tilefish	$14,407	0
MSB	$120,615	10,653
Dogfish	$20,091	5
Sfscupbsb	$11,181	66
Bluefish	$172	278

** Largemesh Groundfish: cod, winter flounder, witch flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock*
*** Smallmesh Multi-Species: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting)*

Vessels by Year

Table 94 Portland Vessel Permits/Landings Values 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value (millions of $)	Landed port Value (millions of $)
1997	122	50	14	43
1998	105	44	12	35
1999	123	53	15	42
2000	118	45	16	45
2001	109	39	15	34
2002	110	43	15	40
2003	117	42	15	27
2004	109	40	18	35
2005	107	47	15	35
2006	101	43	13	28
2007	105	55	10	25
2008	94	45	11	24
2009	100	49	11	18
2010	95	44	15	19

Recreational

Recreational fishing companies based in Portland (or South Portland) include: Go Fish Charters**,** Fishing With Matt and Josh, Maine Fishing Charter and Morning Flight Charters. Boat charters and fishing excursions are available (Go Fish Charters, 2011). First Olde Port Trolley Fleet offers whale watches and sunset cruises.

Subsistence

Information on subsistence fishing in Portland is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Portland is an important community involved in the Atlantic herring fishery. It meets several criteria identified in Section 5.5.3.2 of this document (communities of interest): #1 (herring landings), #2 (herring-related infrastructure), and #3 (lobster/tuna bait dependence). Several lobster bait dealers and a pumping station for offloading herring are located in Portland. Portland's infrastructure includes major highways, shipping terminals, and an airport. The port also provides many additional fishing-related services including ice, fuel, and vessel maintenance/repair services.

Taking a six-year average (2005-2010), Portland ranked third in herring landings in the region (29,773,919 pounds) but in 2010, with a decrease in landings in New Bedford, moved to second place.

5.5.3.2.2 Rockland, Maine

A detailed profile of Rockland, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. This reference also includes information about Sprucehead Island and Port Clyde, two fishing communities located adjacent to Rockland. Rockland's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

The Island Institute, located in Rockland, promotes ecological research to help conservation efforts of 15 Maine island communities, which includes research on fisheries, especially that of lobster fisheries (Island Institute, 2011).

Led by the Island Institute, the Working Waterfront Coalition formed in 2003 to advocate for state legislation that could help preserve the state's dwindling working-waterfront access. The Coalition's efforts led to the November 2005 passage of the Working Waterfront Access Pilot Program (WWAPP), a $2 million state bond fund that provided grants to fishing families, municipalities, cooperatives and businesses to help them purchase working-waterfront property. The WWC also advocated successfully for a statewide designation of working-waterfront property as coming under a "current use" taxation rate instead of being assessed for its development value (Island Institute, 2011)

Until mid-2004, the Conservation Law Foundation (CLF) had an office based in Rockland, but it is now located in Brunswick.

Fishing Associations

Apart from the Maine Lobstermen's Association whose members come from virtually all coastal communities, no active fishing associations were identified for Rockland in secondary data sources.

Commercial

According to the landings data collected on federally managed species, Rockland's commercial fishery is primarily based on the herring and lobster fisheries. According to *Fisheries of the United States-2009,* landings in Rockland totaled 29.6 million pounds in 2008 and 21.4 million pounds in 2009 (NOAA, 2010) For the 6-year period, 2005-2010, the annual average for herring landings in Rockland was 27,546,362 pounds.

In 2002, there were a total of 675 moorings, berthings, slips, and tie-ups for commercial and recreational fishermen, of which commercial fishermen in Rockland used 4%. The city had 21 commercial private and public waterfront facilities, of which two were dedicated to commercial fishing use. Commercial fishing access is not perceived as a problem, but both issues of development pressures and the decline in the commercial fishing industry are reported as threats to commercial fishing access (CEI, 2002).

Table 95 Rockland Dollar Value by Species 1997-2008

	Annual average 1997-2008	**2002 only**
Herring	3,160,804	1,403,932
Lobster	4,630,274	2,498,980
Other	763,830	141,078
Largemesh	97,393	67,925
Scallop	606	151,842
Monkfish	58,991	36,206
Skates	423	347

Table 96 Rockland Vessel Permits/Landings 1997-2010

ROCKLAND Year	# Vessels home ported	# Vessels (owner's city)	Home port value ($100,000)	Landed port value ($100,000)
1997	42	17	29.6	72.7
1998	32	16	13.3	64.4
1999	28	14	14.3	39.1
2000	29	14	10.6	82.1
2001	32	15	9.8	64.2
2002	30	13	9.1	43
2003	26	15	14.3	44
2004	32	18	43	84
2005	30	14	55	74
2006	22	9	61	128
2007	19	11	46	96
2008	19	9	54	48
2009	19	10	42	106
2010	17	9	45	106

Recreational

There are a number of recreational fishing companies that are based in Knox County, close to Rockland (ME DMR, 2006). These include Holy Mackerel Charters in Owls Head and Captain Fred T. Griego in Camden.

Subsistence

No information has been obtained at this time on subsistence fishing.

Atlantic Herring Fishery

Rockland is an important community involved in the Atlantic herring fishery. It meets several criteria identified in Section 5.5.3.2 of this document (communities of interest): #1 (herring landings), #2 (herring-related infrastructure), and #3 (lobster/tuna bait dependence). To a lesser extent, it meets criteria #4 (geographic isolation). Several lobster bait dealers, large and small, and a pumping station for offloading herring are located in Rockland. In addition, there are freezer facilities to store lobster bait and ice services in Rockland. The port also provides other fishing-related services. Ferry service provides transportation to Vinalhaven and other nearby island communities.

At an average of 27,546,362 pounds, Rockland ranked fourth in herring landings in the region over the six-year period 2005-2010, though 2009 and 2010 landings were noticeably lower.

5.5.3.2.3 Stonington, Maine

A detailed profile of Stonington, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Stonington's involvement in fisheries is summarized below. The neighbor communities of Stonington and Deer Isle may be considered representative, sharing characteristics with many other small, somewhat isolated communities in Maine dependent on herring for lobster bait.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

Committed to building marine stewardship at a local, community level, Penobscot East Resource Center was founded in 2003 in Stonington as an outgrowth of The Stonington Fisheries Alliance. In 2005, Ted Ames, Penobscot East's vice-chair, was awarded a MacArthur Fellowship. The Center has numerous collaborators and partners in the region (Penobscot East Resource Center, 2011) including the Northwest Atlantic Marine Alliance (NAMA) (for more information, see the website: www.namanet.org) and Cobscook Bay Resource Center (for more information see website: www.cobscook.org).

Other associations include Stonington Lobster Cooperative, Stonington Fisheries Alliance, Downeast Lobstermen's Association in Deer Isle, Deer Isle-Stonington Shellfish Committee, and Island Fishermen's Wives Association.

Fishery Assistance Centers

Island Fishermen's Wives Association has provided support to the families of the commercial fishing industry for over 15 years.

Other Fishing-Related Institutions

The Maine Sea Grant Program, the School of Marine Sciences, and the Lobster Institute, all located in Orono, ME, are involved in Stonington fisheries (Maine Sea Grant Program, 2011). The Commercial Fisheries News, the premiere monthly fishing industry newspaper for the Atlantic coast, is located in Stonington (For more information see the website: http://www.fish-news.com/cfn/) The Lobster Zone Council (Zone C) is empowered to set trap limits and other management techniques on a zone-by-zone basis, subject to the oversight of the state's Department of Marine Resources (ME DMR, 2011)

Commercial

In 2009, recorded annual fisheries landings for Stonington totaled 14.8 million pounds with a landed value of $26.5 million (NOAA, 2010).

The Maine purse seine fleet consists of five vessels with principal ports of Addison, Prospect Harbor, Rockland, and Stonington. This sector made 340 trips and landed 20,256 mt of herring in 2003. The majority of the landings were from vessels with a port designation of Rockland or Stonington. Ninety five percent of the landings by this sector came from Area 1A (adjacent to Stonington) in 2003. Eighty two percent of the total revenues for this sector came from Atlantic herring in 2003. Maine had the highest reported landings (46%) in 2003, followed by Massachusetts (38%), New Hampshire (8%), and Rhode Island (7%).

Landings by Species

Table 97 Stonington Dollar Value by Species 1997-2010

Catch	Annual Average 1997-2008	2002
Lobster	24,943,249	19,907,431
Other	1,051,836	965,252
Herring	29,522	509,804
Scallops	163,992	241,417
Largemesh*	100,720	106,910
Monkfish	3,947	2,446
Smallmesh	46	0

** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock*

Vessels by Year

Table 98 Stonington Vessels Permits/Landings 1997-2010

Year	# Vessels home ported	# Vessels (Owner's city)	Home port Value ($)	Landed port Value ($)
1997	44	36	653,135	10,718,821
1998	44	33	506,533	9,739,864
1999	46	33	270,941	9,123,045
2000	49	35	234,698	18,003,137
2001	52	33	509,830	16,616,914
2002	59	40	429,571	21,733,899
2003	65	44	413,737	20,544,254
2004	71	45	320,936	22,421,527
2005	79	51	905,326	32,325,429
2006	76	48	404,453	34,327,204
2007	70	42	601,570	28,891,240
2008	68	39	10,311,136	27,521,636
2009	67	39	10,124,741	26,819,689
2010	68	38	14,707,059	16,976,794

Recreational

No recreational charter boats are listed by the Division of Marine Resources as based in Stonington, but there are several nearby (in Hancock County) (ME DMR, 2006).

Subsistence

Information on subsistence fishing in Stonington is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Stonington is involved in the Atlantic herring fishery primarily through its dependence on herring for lobster bait. It meets criteria #3 (lobster/tuna bait dependence) and #4 (geographic isolation) identified in Section 5.5.3.2 of this document (communities of interest). Stonington and Deer Isle may be considered representative communities, sharing characteristics with many other small, somewhat isolated communities in Maine dependent on herring for lobster bait.

Stonington reported an annual average of herring landings for the six-year period 2005-2010 of 8,575,217 pounds, though there was a precipitous drop in landings in 2010 to just under 3 million pounds.

5.5.3.2.4 Deer Isle, Maine

A detailed profile of Deer Isle, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Deer Isle's involvement in fisheries is summarized below. Neighbors Stonington and Deer Isle may be considered representative communities, sharing characteristics with many other small, somewhat isolated communities in Maine dependent on herring for lobster bait.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

Fishing associations are Downeast Lobstermen's Association in Deer Isle, Deer Isle-Stonington Shellfish Committee, and Island Fishermen's Wives Association.

Fishery Assistance Centers

As noted above, the Island Fishermen's Wives Association has provided support to the families of the commercial fishing industry for over 15 years.

Other Fishing Related Institutions

The Maine Sea Grant Program, the School of Marine Sciences, and the Lobster Institute all located in Orono, ME, are involved in Stonington and Deer Isle fisheries (Maine Sea Grant Program, 2011) Lobster Zone Council (Zone C) is empowered to set trap limits and other management techniques on a zone-by-zone basis, subject to the oversight of the state's Department of Marine Resources (ME DMR, 2011).

Commercial

The Conary Cove Lobster Company located in Deer Isle is wholesale and retail vendor of seafood. In 2002 recorded annual landings for Maine totaled 197 million pounds with a landing value of $279.4 million (NOAA Fisheries, 2010). Commercial fisheries landings in 2010 were 251,299,375 pounds with a value of $450.6 million (ME DMR, 2008). Deer Isle annual landing value for 2002 was $376,994 including an annual lobster landing value of $361,105. In 2003, the value of landings at dealer-reported port was $896,389.

Landings by Species

Table 99 Deer Isle Dollar Values by Species

Catch	Annual Average 1997-2008	2002
Lobster	2,984,573	316,105
Scallops	61,374	0
Other	58,124	60,889

Vessels by Year

Table 100 Deer Isle Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value ($)	Landed port value ($)
1997	10	19	0	4,253,859
1998	10	19	0	6,233,997
1999	11	23	80,812	7,699,074
2000	12	23	581	2,142,604
2001	13	29	0	0
2002	24	41	0	0
2003	17	34	0	0
2004	27	53	0	0
2005	27	55	0	0
2006	23	49	0	0
2007	26	53	0	0
2008	27	54	0	0
2009	27	54	0	0
2010	29	55	0	0

Recreational

No listings specifically cite Deer Island, but the state's Division of Marine Resources offers several businesses nearby (in Hancock County) (ME DMR, 2006).

Subsistence

Information on subsistence fishing in Deer Isle is either not available through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Deer Isle is involved in the Atlantic herring fishery primarily through its dependence on herring for lobster bait. It meets criteria #3 (lobster/tuna bait dependence) and #4 (geographic isolation) identified in Section 5.5.3.2 of this document (communities of interest). Stonington and Deer Isle may be considered representative communities, sharing characteristics with many other small, somewhat isolated communities in Maine dependent on herring for lobster bait.

5.5.3.2.5 Vinalhaven, Maine

A detailed profile of Vinalhaven, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Vinalhaven's involvement in fisheries is summarized and additional information collected by Herring PDT members is provided below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

Vinalhaven Fishermen's Coop supplies their lobstermen owner-operators with bait and fuel and distributes their lobsters to customers throughout the world (Vinalhaven Fisherman's Co-op, 2011)

The bait company, Alfred Osgood, is a member of The Maine Lobstermen's Association (MLA, 2010)

Fishery Assistance Centers

The Island Fishermen's Wives Association supports the fishing community in many ways: school programs and scholarships, emergency financial assistance to fishing people and their families; ongoing commitment to preserve the fishing heritage and educating the public about the industry; survival and safety education with help from the US Coast Guard (Island Fishermen's Wives Association, 2011)

Commercial

The majority of landings in Vinalhaven are lobster. Two hundred lobster boats are clustered in Vinalhaven's Carver's Harbor and four lobster-buying stations are nearby (Island Institute, 2011). In 2006, there were 304 commercial licenses issued to Vinalhaven residents.

Maine's Department of Marine Resources reported in 2003 that 19,758,705 pounds of lobster were landed in Knox County; in 2010 there were 24,559,336 pounds landed, valued at $79,900,141. Two purse seiners landed herring for bait in Vinalhaven in 1999 (Hall-Arbor et al, 2001). There is also some crab, shrimp, and scallop fishing but no finfishing, apart from baitfish (pers. comm.).

The number of vessels home-ported in Vinalhaven increased from 1997 to 2004, and then fell. Since 1997 the homeport value has decreased by more than half while the landed port value increased from $13 million in 1997 to $30 million in 2005, but fell to $20 million in 2010.

There were no processing plants in Vinalhaven in 2004, however the town previously had a processing plant that they leased out to a private company known as "Claw Island"; it had 70 employees, and ran 3 8-hour shifts, which processed crabs or shrimp in winter, and lobster in summer. In 2000, Claw Island was bought out and after encountering too many problems operating the processing plant on the island, it moved to South Portland (Claw Island, 2011).

Vinalhaven has several packaging companies that ship lobster to Portland and other inland locations for processing and distribution (pers. comm.). They include: Vinalhaven Lobster Co. which packages lobster and ships inland to Portland for processing and Vinalhaven Fishermen's Co-op which operates as a wholesale lobster distributor (Vinalhaven Fisherman's Co-op, 2011). Vinalhaven has three wholesale companies: Linda Bean's Perfect Maine, Inland Seafood and Alfred Osgood (MLA, 2010)

In 2010, Inland Seafood Co. sold their wharf to Linda Bean's Perfect Maine. The wharf is now known as Americanus wharf, one of two owned by Bean in Vinalhaven. The real estate transfer included an agreement to preserve a certain percentage of lobsters for Inland Seafood Company, which processes lobster at their facility in Portland (Mainebiz News Staff, 2010)

Landings by Species

Table 101 Vinalhaven Value by Species 1997-2008

Species	Average Annual Value in Dollars for 1997-2008	Value in Dollars for 2002
Lobster	20,741,325	20,100,439
Herring	597,309	326,398
Other Species	403,058	888,465

Source: Maine Lobstermen's Association

Vessels by Year

Table 102 Vinalhaven Vessel Permits/Landings Value Between 1997 and 2010

Year	# Vessels Home ported	#Vessels (owner's city)	Home port Value ($)	Landed port Value ($)
1997	55	58	0	0
1998	54	56	0	0
1999	59	60	0	0
2000	59	58	1,766,609	12,379,840
2001	58	60	1,036,243	18,571,121
2002	62	65	644,067	21,322,045
2003	60	60	763,276	22,055,061
2004	66	66	1,203,341	28,905,797
2005	59	60	2,629,449	30,116,633
2006	61	62	1,731,409	21,647,435
2007	47	48	2,150,598	23,297,454
2008	47	48	0	0
2009	47	48	0	0
2010	46	46	10,872,100	19,694,161

Recreational

Only nine recreational boats are registered in Vinalhaven and these are apparently privately owned. One company offers boat rides and seabird cruises.

Subsistence

Information on subsistence fishing in Vinalhaven is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Vinalhaven is an important community involved in the Atlantic herring fishery primarily because of its significant dependence on lobster bait. It meets several criteria identified in Section 5.5.3.2 of this document (communities of interest): #2 (herring-related infrastructure), #3 (lobster/tuna bait dependence), and #4 (geographic isolation). Several lobster bait dealers, including floating stations and a co-op, are located in Vinalhaven, as the majority of year-round residents participate in the lobster fishery. Ferry service provides transportation between Vinalhaven and Rockland.

Vinalhaven ranked ninth in herring landings in 2004 (2,674 mt) and tenth cumulatively from 1995-2004 (24,779 mt).

Additional Community Information

The following information on Vinalhaven was supplied by a variety of the individuals when three members of the Herring PDT visited in July 2004.

Vinalhaven is an island of 15 x 5 miles with a year-round population of 1,200 people that swells to 5,000-6,000 in the summer. Knox County is the highest producer/harvester of lobsters in the State of Maine, and one-third of the lobsters landed in Knox County are from Vinalhaven. Approximately 200 lobster boats are based on Vinalhaven, with five buying stations on the island of which two are remote stations (floating docks). Lobstermen on the island are said to be doing well financially. The conversion to plastic-coated steel traps, formation of co-ops, upgrading to new more efficient boats, and other adaptations have helped.

Bait is a driving force in the lobster industry. Vinalhaven has an enormous demand for herring and is almost wholly dependent on the delivery of bait by O'Hara's F/V Starlight. Some bait is also delivered by the carrier Double Eagle and F/V Western Sea. About 4,000 tons of bait is used annually by lobstermen on Vinalhaven. Shafmaster has recently opened a buying station on Vinalhaven, working with 16 boats. They want to prove that they can service these 16 (constant supply of bait) before taking on additional vessels. When they started, they were bringing bait over on the ferry, now a carrier brings bait to the station.

The ferry from Rockland is too small to transport sufficient bait, particularly at the height of the season, which coincides, with the height of the tourist season (nor, it was said, would the steamship authority appreciate the smell if large quantities were transported). The mail, UPS, food, and cars have priority on the ferry. There is little storage capacity on the island, so if the F/V Starlight is unable to make a bait delivery for a few days, island lobstermen are forced to tie-up. Since the F/V Starlight does not fish on the weekend, most of the buying stations have little bait available on Monday morning. Bait dealers on Vinalhaven pay a higher price for bait than dealers on the mainland.

Lobster boats from Vinalhaven used to stay out fishing until 9 p.m.; now, most boats go out earlier, fish harder, and return by 6 p.m. (trap limits and faster boats have also affected their workload). Access to salted bait makes the timing easier. In the past, lobstermen's wives would pick up the fresh bait at 4 a.m.; now, barrels can be delivered between 9 a.m. and 2 p.m., and lobstermen bait up on their own schedule. If bait were to become unavailable or if the lobster population "crashed," it would be the young lobstermen who would be most vulnerable. They have never known hard times or a shortage of lobsters, so they may not save money for slow times or otherwise engage in financial planning. Property values have increased substantially since 1999, as have property taxes. Several interviewees anticipate that when

the groundfish biomass increases, the lobster population will diminish since groundfish prey on juvenile lobsters.

The island has one grocery store, one gas station, one bank and a small health clinic. It also has a new grade/high school with classrooms equipped with up to date technology. The women are an important part of the labor force, especially since most of the men are out on the boats. Approximately 50 to 60 women work with the lobsters on shore, mainly part-time. They sell bait, buy lobsters, load trucks, etc. Apart from jobs at the school, alternative jobs are limited to construction/carpentry, plumbing, and electrical work, outside of the seasonal tourism trade. There is very little ethnic diversity on the island.

Inland Wholesale Lobster (Vinalhaven, ME)

Inland provides the lobster boats that sell to the company with bait and fuel. Approximately 38 boats work with Inland each year. The company has a "chilled" bait room to maintain higher quality bait. Inland tries to keep a few extra days' worth of bait in storage as a cushion, but it is not unusual to run out. When bait is scarce, only their regular 38 boats are provided with bait. It is in the company's interest to make sure the lobstermen who sell lobsters to them, have bait available at all times.

Vinalhaven Fishermen's Cooperative

The co-op has 70 members with 40 vessels and 15 employees (6 year-round). Members make one payment of $200 for a co-op share and an annual membership fee of $200. A volunteer Board of Directors (natives of Vinalhaven) handles most policy, though major decisions such as building a new wharf require a general meeting. Members of the co-op are required to make the majority of their income from fishing and each member has one vote. Members are not required to sell to the co-op, but the dividends are based on the profit divided by the number of pounds each boat lands. In general, the existence of the co-op benefits even the fishermen who are not members since it "sets the price" for the other buyers. Furthermore, the dividend paid by the co-op to its members often dictates the amount other buyers give as bonuses to their regular customers/suppliers.

The co-op provides:

- access to the waterfront, parking, and storage space;
- bait and fuel (they have their own gas station); and
- better prices for the lobsters.

Co-ops were started because lobstermen felt that the middlemen were taking advantage of them. Choice of dealer has to do with financial incentives, quality of bait, location, history with the dealer (e.g., family ties). Some people do not like the loss of privacy associated with the co-op since members must give their records to the board and bookkeeper; however, information is confidential, apart from these individuals.

There are twenty-four fishermen's cooperatives in Maine among whom there is an informal collaboration (when in the best interest of the fishermen):

- Beals-Jonesport Lobster Co-Op
- Bremen Lobster Pound Coop
- Corea Lobster Cooperative
- Cranberry Isles Fishermen's Co-op
- Dropping Springs Lobster co
- Fishermen's Heritage Lobster Coop

- Friendship Lobster Coop
- Georgetown Fishermen's Coop
- Interstate Lobster Coop
- Isle au Haut Lobstermen's Assoc
- Lobstermen's Co-op
- New Harbor Fishermen's Coop
- North End Lobster Coop
- Pemaquid Fishermen's Coop
- Pine Point Fisherman's Coop
- Port Clyde Fisherman's Coop
- So. Maine Lobstermen's Association
- South Bristol Fishermen's Co-op
- Spruce Head Fishermen's Coop
- Stonington Lobster Cooperative
- Swan's Island Fishermen's Co-op
- Vinalhaven Fishermen's Coop
- Winter Harbor Lobster Cooperative

5.5.3.2.6 Lubec/Eastport, Prospect Harbor (Gouldsboro), and Bath, Maine

Lubed/Eastport, Prospect Harbor, and Bath, Maine were included in the FEIS written for Amendment 1 to the Herring FMP because all fulfilled four criteria for "communities of interest": #2 (herring-related infrastructure), #3 (lobster/tuna bait dependence), #4 (geographic isolation), and #5 (value-added production), but since then all three have lost their value-added production.

Until 2006, a pearl essence processing plant that derived its pearl essence from herring scales was located in Eastport (Engelhard Corp); however, BASF Catalysts LLC, a German chemical company, bought out Engelhard. Though Lubec does meet several criteria identified in in Section 5.5.3.2 of this document (communities of interest): #2 (herring-related infrastructure), #3 (lobster/tuna bait dependence), #4 (geographic isolation), and #5 (value-added production), it can be considered similar to other small, representative ports that do rely in part on the herring industry. No herring landings were reported in Lubec/Eastport in 2004.

Bath lost the second to last sardine cannery in the United States in 2005 when Stinson/Bumblebee consolidated their cannery operations to Prospect Harbor.

Similarly, a pumping station for offloading herring and the last remaining sardine cannery operated in Prospect Harbor until 2010. Without the value-added production, Prospect Harbor also may be considered similar to other small ports with a herring dependency associated with the need for lobster bait and geographic isolation.

5.5.3.2.7 Sebasco Estates, Maine

Sebasco Estates is a small village within the town of Phippsburg – a subdivision of Sagadahoc County (According to the Phippsburg Postmaster, Sebasco Estates is primarily a PO box address, with people having Sebasco Estates zip codes living side by side with those having Phippsburg zip codes. Few data are available for Sebasco Estates alone, so Phippsburg will be the primary referent, with additional Sebasco Estates specific data supplies as available.) The town of Phippsburg also includes the villages of Phippsburg, Parker Head, Popham Beach, West Point, and Sebasco. A detailed profile of Phippsburg, Maine, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Phippsburg's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Governmental

Fishery Involvement in Government

The attention the town's Comprehensive Plan affords commercial fishermen suggests that Phippsburg's local government appreciates the commercial fishing industry. The town has a Town Landing Committee that includes at least two commercial fishermen. The Committee is advisory to the Selectmen who promulgate rules. Phippsburg also has a Harbor Commission and Shellfish Committee that all take an active part in commercial fishery matters. In 2006, the Chair Selectman of Phippsburg was Proctor Wells, a commercial fishermen and Mike Young, town administrator, designed and currently maintains the website for the Maine's Fishermen's Forum (pers comm).

Fishery Assistance Centers

There are currently no fishery assistance centers in Phippsburg. However, the formation of a fishermen's Co-op is an idea that is being discussed by town leaders and the fishing industry.

Other Fishing-Related Institutions

Commercial

West Point and Sebasco have the greatest number of commercial, water-dependent users, followed to a lesser degree by Small Point Harbor and Popham Harbor. The town itself controls a limited amount of waterfront property with shore access suitable for marine related business. Sebasco Harbor is the largest harbor in Phippsburg. The north side of the harbor is used extensively by commercial fishermen and has 11 commercial piers and numerous small private piers. There is one commercial boat yard with marine railway/mobile boatlift and a commercial bait business. Small Point Harbor has a large number of commercial vessels year round. Mooring space is full during the summer-season. There is a fish pier and 15-boat marina at Hermit Island and a fishermen's cooperative pier at Small Point. West Point Harbor has seven commercial/private fish piers and one service pier for gas/diesel fuel.

Landings by Species

Table 103 Phippsburg Dollar Values by Species 1997-2008

Species	Annual Average 1997-2008	2002
Lobster	3,293,402	1,570,922
Other Species	614,981	370,501
Large Mesh	34,989	27,002
Monkfish	9,995	3,370
Skates	158	33
Herring	2,540	

Vessels by Year

Table 104 Phippsburg Vessels Permits/Landings Values 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port Value ($)	Landed port Value ($)
1997	9	19	221,629	388,083
1998	9	34	53,827	0
1999	8	38	10,117	0
2000	7	38	8,564	0
2001	6	38	0	439,372
2002	5	39	0	1,971,828
2003	5	41	0	716,851
2004	53	53	199,072	4,487,468
2005	49	48	306,258	5,289,081
2006	45	44	0	0
2007	44	43	0	0
2008	43	41	975,454	1,614,263
2009	42	42	0	0
2010	40	39	0	0

Recreational

Phippsburg supports a large recreational fishing fleet. In fact, the town encourages recreational shellfishing. There are also some businesses that take tourists on fishing excursions.

Subsistence

Information on subsistence fishing in Phippsburg is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Sebasco Estates/Phippsburg is an important community involved in the Atlantic herring fishery primarily due to its dependence on herring for lobster bait. It is another suitable "representative community," sharing characteristics similar to many other small communities in Maine that are dependent on the herring fishery through its involvement in the lobster fishery. Several lobster bait dealers, large and small, located in this area rely on herring catches to supply their customers. In addition, the bait dealers are actively engaged in the trucking of herring from landing sites to purchase sites.

5.5.3.2.8 Newington, New Hampshire

Newington is a small town bounded by Great Bay, Little Bay and the Piscataqua River with a population of 753 at the time of the 2010 Census (U.S. Census, 2010). A detailed profile of Newington, New Hampshire, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Newington's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

In 2003 Little Bay Lobster Company and two Canadian affiliates, Island Marine Products, Inc. and Ferguson's Lobster Company, established a cooperative headquartered in Newington, New Hampshire. They advertise a commitment to "marine stewardship and environmental practices to ensure a sustainable resource and healthy oceans." (Little Bay, 2011)

Fishery Assistance Centers

Information on assistance centers in Newington is either unavailable through secondary data collection or it does not exist.

Other Fishing Related Institutions

Information on other fishing related institutions in Newington is either unavailable through secondary data collection it does not exist.

Commercial

In 2002, recorded annual landings for New Hampshire totalled 23.2 million pounds with a landed value of $16.7 million (Fisheries of the United States, 2002) In 2009, the annual landings for the state totalled 13,885 thousand pounds (6,298 metric tons) valued at $17.8 million (NOAA Fisheries, 2010) Newington's annual landed value for 2002 was of $7.1 million including an annual lobster landing value of $6.1 million, and an annual herring landing value of $777,640. In 2002, the value of landings at dealer-reported port was of $7.1 million.

Herring landings in Newington for 2005 were robust though not as high as in 2002, fell in 2006, decreased further in 2008 and 2009, and started to rebuild in 2010.

The North of Cape Cod midwater trawl fleet (pair and single) consists of 15 vessels with principal ports of Gloucester MA, Newington NH, New Harbor ME, Portland ME, Rockland ME, and Vinalhaven ME. This sector made 720 trips and landed 62,145 metric tons of herring in 2003. Maine had the highest reported landings (46%) in 2003, followed by Massachusetts (38%), New Hampshire (8%), and Rhode Island (7%).

A commercial fishery for American lobster is very active in Great Bay Estuary and beyond. Little Bay Lobster Company of Newington was founded in 1980. The company specializes in the harvesting of Atlantic offshore lobster (out to 200 miles) from the Gulf of Maine and Georges Bank (Little Bay, 2011).

Other commercial fisheries in the Great Bay estuary include herring, baitfishing for alewives, mummichogs (*Fundulus sp.*) and tomcod using gillnets, seines and minnow traps; trapping for eels, and angling and dip netting for smelt.

In the early 1980s, there were four commercial shellfish aquaculture operations in the Great Bay Estuary, engaged in the culture of indigenous (Eastern) oysters, the European flat oysters and hard clams (*Mercenaria mercenaria*). As of April 2010, three commercial oyster farms in the estuary and three mussel operations in the Atlantic Ocean were licensed by the state. In 2009, the state issued 1,400 recreational licenses for harvesting soft shell clams and oysters. An additional 1,300 people age 68 and older are allowed to harvest for free. But, a cut in the state budget may shut down all commercial and recreational shellfishing because the state would not meet the federal standards to test the water to ensure the shellfish are safe to eat (Love, 2011).

A commercial summer flounder hatchery and nursery, GreatBay Aquaculture, founded in 1995, produces millions of juveniles for growout in commercial locations and research institutes. The company's operations are based in a warehouse on the Public Services of New Hampshire (PSNH) power generation site in Newington, NH and are entirely indoors, using sophisticated recirculating and biofiltration technology to grow fish in land based tanks. It is the first commercial summer flounder operation in the U.S. They have since diversified to cod, sea bass and cobia (Great Bay Aquaculture, 2011). GBA collaborates on various university research projects to improve finfish aquaculture, including on effort investigating polyculture of Atlantic cod and porphyra (Nori).

Landings by Species

Table 105 Newington Dollar Value by Species 1997-2008

Catch	Annual Average 1997-2008	2002
Lobster	6,575,221	6,105,127
Herring	431,303	777,640
Other	126,945	308,915
Monkfish	7993	281
Largemesh *	1,820,311	0
Skates	49	0

** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock.*

Vessels by Year

Table 106 Newington Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value ($)	Landed port value ($)
1997	6	8	29,602	0
1998	7	8	25,340	0
1999	7	10	8,132	0
2000	8	12	23,673	45,17,859
2001	9	11	39,708	8,671,224
2002	9	12	3,003	7,191,963
2003	9	14	0	8,129,839
2004	3	16	0	0
2005	2	17	0	0
2006	2	12	0	0
2007	1	12	0	0
2008	10	14	0	0
2009	11	12	0	0
2010	11	11	0	0

Recreational

Large oyster beds within the Great Bay estuary are harvested recreationally (Great Bay National Estuarine Research Reserve, 2011). The Great Bay Estuary also supports a diverse community of resident, migrant, and anadromous fishes, many of which are pursued by recreational fishermen. The main species sought are striped bass, bluefish, salmon, eels, tomcod, shad, smelt, and flounder. Cast or bait fishing is done from the shore in many places including the bridges crossing the estuary, and ice fishing is popular in the tidal rivers. Recreational fishing in salt water does not require a license except for smelt in Great Bay Estuary; trout, shad and salmon in all state waters; and for any fish species taken through the ice. Another important recreational fishing activity is trap fishing for lobsters.

Subsistence

Information on subsistence fishing in Newington is either available through primary data collection or the practice does not exist.

Atlantic Herring Fishery

Newington is an important community involved in the Atlantic herring fishery. It meets several criteria identified in in Section 5.5.3.2 of this document (communities of interest): #1 (herring landings), #2 (herring-related infrastructure), and #3 (lobster/tuna bait dependence). Several lobster bait dealers, large and small, and a pumping station for offloading herring are located in Newington. In addition, there are freezer facilities to store lobster bait in Newington. The port also provides other fishing-related services and is nearby major transportation routes.

Newington ranked fifth in herring landings in 2004 (5,660 mt) and 12th cumulatively from 1995-2004 (16,805 mt,).

5.5.3.2.9 Portsmouth, New Hampshire

A detailed profile of Portsmouth, New Hampshire, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Portsmouth's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishery Involvement in Government

The City of Portsmouth created a Fishermen's Committee in 2008. The following year, the Committee unveiled its "New Hampshire Seafood Fresh and Local" brand, furthering its goal of promoting and advancing the region's fishing industry and area businesses by educating the public about the benefits of purchasing seafood locally and directly.

Fishery Assistance Centers

For twenty-five years, Portsmouth Fisherman's Cooperative provided fuel, ice and unloading services to the local, small-scale fishing community. In 2002, the Cooperative closed, though reopened for a time, closing for good in 2008 (Schmitt, 2002)The Northeast Consortium, created with the support and leadership of U.S. Senator Judd Gregg (R-N.H.), committed resources to fund the Portsmouth co-op staff to facilitate partnerships between the co-op and researchers in 2005.

Yankee Fishermen's Cooperative in nearby Seabrook, founded in 1990, has 61 members, some of whom were former members of Portsmouth Fishermen's Co-op.

Other Fishing Related Institutions

Physical

Portsmouth has an extensive public transportation infrastructure including rail, ferry, and bus transportation.

High Liner Foods (National Sea Products), a Canadian company, has a processing plant in Portsmouth that employed about 250 people in 2001 (Community Development Department, 2011) It imports and processes frozen fish into breaded products for the wholesale and retail markets.

Commercial

The primary fishing done by Portsmouth fishermen is large mesh groundfish and monkfish. Large mesh groundfish were the most valuable landings in Portsmouth during the 1997-2003 period. Additionally, monkfish, lobster, and sea scallops account for a large portion of the value. In 2002, sea scallop landings appeared to be very high while lobster was rather low.

The number of home-ported vessels has varied between 1997-2003. In 1997 there were 54 vessels that increased to a high of 63 vessels in 2001, only to decrease back to 54 vessels in 2003. Thus, overall change has been minimal in this time period. Landed value by vessels home ported in Portsmouth steadily increased from $2.8 million in 1997 to $4.7 million in 2003. Landed value at the port of Portsmouth remained relatively stable between the years of 1997 and 2003.

Landings by Species

Table 107 Portsmouth, Average Annual Value of Landings by Species

Species	Annual Average Value 1997-2008 ($)	2002 ($)
Large Mesh Groundfish	1,820,311	1,656,320
Monkfish	1,072,451	1,377,046
Lobster	1,442,007	225,911
Sea Scallops	177,733	668,956
Dogfish	98,032	22,920
Herring	55,640	2,850
Small Mesh Multi-Species	12,332	3,295
Skates	4,092	3,834
Bluefish	2,731	983
Butterfish, Mackerel, and Squid	1,911	331

Vessels by Year

Table 108 Portsmouth Vessel Permits/Landings Value 1997-2010

Year	# Of vessels Home ported	# Vessels (Owner's city)	Home port value ($)	Landed port Value ($)
1997	54	26	2,867,809	4,476,980
1998	44	20	2,875,939	3,421,488
1999	45	18	3,338,685	3,900,793
2000	62	21	5,156,955	5,456,999
2001	63	22	6,386,029	4,909,069
2002	59	25	4,340,580	4,146,607
2003	54	21	4,735,506	4,309,797
2004	68	25	4,899,357	2,884,931
2005	64	20	18,201,382	5,554,531
2006	62	18	14,125,508	4,860,632
2007	66	22	12,367,300	3,768,336
2008	47	17	5,072,961	3,529,142
2009	44	14	3,587,458	3,702,399
2010	48	14	3,497,953	4,677,645

Recreational

Portsmouth supports a large recreational fishing industry. Numerous companies are available for deep-sea fishing (www.portsmouthnh.com) Many of these companies also offer whale watching and day cruises.

Subsistence

Information of subsistence fishing in Portsmouth is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Portsmouth is somewhat involved in the herring fishery through its dependence on herring for lobster and tuna bait. The port is centrally located with a 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).

5.5.3.2.10 Hampton, New Hampshire

A detailed profile of Hampton, New Hampshire, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Hampton's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

The Yankee Fishermen's Cooperative (61 members) in Seabrook is the landing site and central wholesaling facility for the small local fleet that includes groundfish fishermen, lobstermen, tuna fishermen and shrimpers (Yankee Fishermans Cooperative, 2010). The Co-op provides a number of services for its members including bait, ice, cold storage and discounted goods from the Co-op store (Hampton Library, 2011). The Co-op has successfully diversified to improve marketing initially by offering a Northern shrimp Community Supported Fishery (CSF) in 2010, then offering CSF shares in whole finfish and lobster.

Fishery Assistance Centers

Information on assistance centers in Hampton is either unavailable through secondary data collection or it does not exist.

Other Fishing Related Institutions

The Recreational Fishing Alliance is a national, grassroots political action organization representing individual sport fishermen and the sport fishing industry (Recreational Fishing Alliance, 2011). Since 1998, the Coastal Conservation Association (CCA) of New Hampshire has worked to "promote, protect and enhance the present and future availability of coastal resources for the benefit and enjoyment of the general public." It is an organization composed of recreational fishermen and other users of marine resources and that addresses conservation issues nationally and at the state level (Costal Conservation Association of New Hampshire, 2009).

Commercial

Most of the commercial fishermen in Hampton are members of the Yankee Fisherman's Cooperative (Co-op) that is located in Seabrook Harbor (Hampton Library, 2011). The Co-op provides a number of services for its members, including bait, ice, cold storage, marketing, and discounted goods from the Co-op store.

Hampton Harbor has about a 183 moorings, 52 of which are classified as commercial. There are also a number of part-time fishermen that use the harbor. Depending on the season, a fisherman might fish for a variety of species – groundfish in the spring, shrimp in the winter, and finfish in the summer or fall. Lobsters may be taken year round, though stocks are more abundant in the late spring, summer and fall. Because of the federal limits on catch for groundfish, some of the fishermen only go lobstering.

In 2002 recorded annual landings for New Hampshire totaled 23.2 million pounds with a landing value of $16.7 million (Fisheries of the United States, 2002). In 2009, annual landings were lower in volume at 13.9 million pounds (6,298 metric tons) but a slightly higher value of $17.8 million. Hampton annual landing value for 2002 was of $124,136 including an annual lobster landing value of $121,784 significantly higher than the average between 1997-2003. In 2002, the value of landings at dealer-reported port was $123,761, and the landed value of home-ported vessels was $1.4 million.

The commercial industry in Hampton/Seabrook estuary is very active, and the wholesalers and retailers of seafood are primarily located in Hampton. The Yankee Fisherman's Cooperative Pier in Hampton Harbor has a seafood processing facility that handles both shellfish and finfish where landings from Seabrook are also processed. Other commercial fisheries in the Hampton/Seabrook estuary include herring, baitfishing for alewives, mummichogs (*Fundulus sp.*) and tomcod using gillnets, seines and minnow traps; trapping for eels, and angling and dip netting for smelt.

Landings by Species

Table 109 Dollar Value by Federally Managed Groups of Landings in Hampton

Catch	Annual Average 1997-2008	2002
Lobster	1266	121,784
Largemesh *	53614	27
Scallops	2654	0
Monkfish	1856	0

** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock*

Vessels by Year

Table 110 Hampton Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value ($)	Landed port Value ($)
1997	42	26	900,990	0
1998	37	23	1,096,890	0
1999	43	25	786,680	0
2000	43	25	1,284,983	0
2001	45	29	1,195,246	84,232
2002	49	31	1,359,713	124,136
2003	47	33	1,394,132	123,761
2004	56	37	0	0
2005	51	34	0	0
2006	44	29	0	0
2007	46	31	0	0
2008	49	32	0	0
2009	49	28	1,793,068	544,672
2010	47	29	1,508,335	325,756

Recreational

There are numerous tourist-related businesses including sport fishing, whale watching, windjammers/charter sailing, and harbor tours/day cruises (Hampton Area Chamber of Commerce, 2011). Recreational shellfishing is allowed in the harbor area under limited conditions on weekends from November to May. Most of the shellfish activity occurs on the Hampton/Browns Confluence Flat, Common Island Flat, and Middle Ground Flat. The latter two are in Seabrook Harbor. There is no commercial shellfishing permitted in New Hampshire (Hampton Library, 2011).

Several charter boat companies in Hampton Harbor carry fishing parties to inshore waters for clams and to the offshore waters to pursue cod, flounder, mackerel, and other fish. Another important recreational fishing activity is trap fishing for lobsters.

Subsistence

Information on subsistence fishing in Hampton is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Hampton is somewhat involved in the herring fishery through its dependence on herring for lobster and tuna bait. Only 2 mt of herring were reported to have been landed in Hampton in 2004.

5.5.3.2.11 Seabrook, New Hampshire

A detailed profile of Seabrook, New Hampshire, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Seabrook's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

The Yankee Fishermen's Cooperative (61 members) in Seabrook is the landing site and central wholesaling facility for the small local fleet (Yankee Fisherman's Cooperative, 2010). The New Hampshire Commercial Fishermen's Association–"Monitors, participates and contributes to concerns and issues regarding the commercial fishing industry of New Hampshire. Disseminates information amongst its members and acts in a proactive manner on behalf of the commercial fishing industry. Conducts an annual beach clean up of lobster gear. Assists in transition of fishing industry due to changing regulatory action." (New Hampshire Department of Environmental Services, 2011).

Fishery Assistance Centers

Information on fishery assistance centers in Seabrook is either unavailable through secondary data collection or it does not exist.

Other Fishing-Related Institutions

The Recreational Fishing Alliance is a national, grassroots political action organization representing individual sport fishermen and the sport fishing industry (The Recreational Fishing Alliance, 2011). The Coastal Conservation Association (CCA) is an organization composed of recreational fishermen and that addresses conservation issues nationally and at the state level. It was formed in 1998 in New Hampshire (Costal Conservation Association of New Hampshire, 2009).

Commercial

In 2002, recorded annual landings for New Hampshire totaled 23.2 million pounds with a landing value of $16.7 million (NOAA Fisheries, 2003) By 2008, landings were less than half at 10,951 million pounds; through the landing value was $20,789 million. In 2009,13,885 million pounds were landed, valued at $17,775 million (NOAA Fisheries, 2010).

Seabrook annual landing value for 2002 was of $1.9 million including an annual large mesh fish landing value of $1.2 million. The lobster landing value in 2002 represented 37.7% of the 1997-2003 average, and the monkfish landing value in 2002 represented 22.3% of the 1997-2003 average. In 2002, the value of landings at dealer-reported port was of $1,9 million, and the landed value of home-ported vessels was of $506,697.

The commercial industry in Hampton/Seabrook estuary is very active. However, most the wholesalers and retailers of seafood are located in Hampton. The Yankee Fisherman's Cooperative Pier in Hampton Harbor has a seafood processing facility that handles shellfish and finfish landings from both Seabrook and Hampton (Yankee Fisherman's Cooperative, 2010).

Other commercial fisheries in the Hampton/Seabrook estuary include herring, baitfishing for alewives, mummichogs (*Fundulus sp.*) and tomcod using gillnets, seines and minnow traps; trapping for eels, and angling and dip netting for smelt.

Landings by Species

Table 111 Seabrook Dollar Value by Species 1997-2008

Catch	Average 1997-2008	2002
Largemesh*	363,227	1,273,459
Lobster	384,577	258,069
Monkfish	3,8630	158,605
Other	425,464	76,034
Smallmesh**	29,721	74,135
Scallops	9,666	48,501
Dogfish	18,753	14,980
Skates	1,218	2,230
Bluefish	1,161	1,227
MSB	1,943	856
Herring	2,906	16

** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock*
*** Smallmesh Multi-species: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting)*
**** MSB: Butterfish, Mackerel, and Squid*

Vessels by Year

Table 112 Seabrook Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port Value ($)	Landed port value ($)
1997	38	30	671,422	0
1998	30	23	747,358	0
1999	28	25	506,697	0
2000	31	29	759,818	0
2001	38	32	806,533	0
2002	37	31	838,476	1,908,112
2003	33	29	817,311	2,095,779
2004	0	0	0	0
2005	0	0	0	0
2006	0	0	0	0
2007	0	0	0	0
2008	0	0	0	0
2009	0	0	0	0
2010	0	0	0	0

Recreational

There are numerous tourist-related activities including sport fishing, whale watching, windjammers/charter sailing, and harbor tours/day cruises. These companies include: Eastman's Deep Sea Fishing, and GTAT Sea Charters LLC (Portsmouthnh.com, 2011).

Subsistence

Information on subsistence fishing in Seabrook is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Seabrook is somewhat involved in the herring fishery through its dependence on herring for lobster and tuna bait. Seabrook ranked 17th in herring landings in 2004 (96 mt).

5.5.3.2.12 Gloucester, Massachusetts

A detailed profile of Gloucester, Massachusetts, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Gloucester's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

The Gloucester Fishermen's Association, Gloucester Lobstermen's Association and the Fishermen's Wharf Association are located in Gloucester. The Massachusetts Fishermen's Partnership, established in Gloucester in 1995, is an umbrella organization for fishermen of any sector within the Massachusetts fishing industry (Massachusetts Fishermen's Partnership, 2011).

Fishery Assistance Centers

The Fishing Partnership Health Plan provided access to health care coverage to thousands of fishermen and their family members from 1997 until it began phasing out its insurance program in 2011 (Fishing Partnership Health Plan, 2011). The Partnership is currently in transition, but anticipates continuing advisory work with fishing communities.

Other Fishing-Related Institutions

The Gloucester Fishermen's Wives Association (GFWA) was founded in 1969 by the wives of Gloucester fishermen. In 2001, they constructed a memorial statue to the fishermen's wives of Gloucester (The Gloucester Fishermen's Wives Association, 2011). In 2010, with the help of the Northwest Atlantic Marine Alliance (NAMA) they started Cape Ann Fresh Catch, a community-supported fishery (Cape Ann Fresh Catch, 2011).

The Northeast Seafood Coalition, an industry and community organization focused on the development of reasonable regulations, reviews of the scientific basis for management, and education of the public, is based in Gloucester.

A permit bank was established with mitigation funds paid by two companies who have constructed Liquid Natural Gas (LNG) terminals off of Gloucester. Permit Banks allow entities such as groups of fishermen, states and even nonprofit organizations to purchase fishing permits on the open market and then lease the quota from these permits back to target fishermen, often at below-market prices.

Commercial

Although there are threats to the future of Gloucester's fishery (see "History" above and "Future" below), the fishing industry remains strong in terms of reported landings. In 2009 Massachusetts landed 356 million pounds (161,490 metric tons) of seafood valued at almost $400 million (NOAA Fisheries, 2010). In the same year, Gloucester's commercial fishing industry had the nation's 10th highest landings in pounds (122.3 million) and the nation's eleventh highest landings value ($50.4 million) (NOAA Fisheries, 2010).

In 2002, Gloucester had the highest landings value of lobster in Massachusetts with the state-only landings worth $2 million and the combined state and federal landings recorded from federally permitted vessels was just over $10 million. Some of the increase in lobster landings has been attributed to Maine vessels that are not allowed to land trawler caught lobsters in their home state. The total number of vessels home-ported increased slightly from 1997 to 2003, but there was a slight reduction for the years 1998, 1999, and 2000. The size distribution of the vessels has also changed.

Landings by Species

Table 113 Landings in Pounds for State-Only Permits in Gloucester

Catch	Pounds landed in 2003
Cod**	4,727,220
Haddock**	2,576,252
Lobster***	2,035,442
Monkfish	587,186
Pollock	503,396
Crab***	178,842
White Hake	171,061
Skate	155,138
Winter Flounder	151,782
Atlantic Mackerel	136,441
Yellowtail Flounde	125,855
Soft Shell Clam*	89,558
Bluefish**	63,446
Red Hake	37,016
Striped Bass**	35,475
Gray Sole (Witch)	25,639
Sea Herring	23,800
Dab (Plaice)	15,754
Cusk	8,672
Wolffish	5,964
Razor Clam*	3,148
Conch*	1,430
Menhaden	700
Whiting	642
Redfish	528
Periwinkles*	400
Bay Scallop*	350
Fluke**	115
Mussels*	100
Halibut	38
Grand Total	11,661,391

Asterisks indicate data sources: Zero: MA DMF has 2 gear-specific catch reports: Gillnet & Fish Weirs. All state-permitted fish-weir and gillnet fishermen report landings of all species via annual catch reports. NOTE: Data for these species do not include landings from other gear types (trawls, hook & line, etc.) and therefore should be considered as a subset of the total landings. (Massachusetts Division Marine Fisheries).
One (*): All state-permitted fishermen catching shellfish in state waters report landings of all shellfish species to us via annual catch reports. NOTE: These data do not include landings from non-state-permitted fishermen (federal permit holders fishing outside of state waters), nor do they include landings of ocean quahogs or sea scallops.)
Two (**): These species are quota-managed and all landings are therefore reported by dealers via a weekly reporting phone system (IVR).
Three (***): All lobstermen landing crab or lobster in MA report their landings to us via annual catch reports.

Table 114 Gloucester Vessel Landings Average Annual Value 1997-2008

	Average Annual 1997-2008 $	2010 only $
Largemesh	23,200,868	31,500,110
Lobster	8,974,730	10,570,800
Monkfish	4,145,420	3,179,896
Herring	4,720,598	5,675,276
Smallmesh	724,254	361,174
Scallops	741,788	437,464
Dogfish	440,359	512,914
Butmacsq	1,398,580	642,491
Skates	101,016	312,300
Bluefish	23,321	20,779
Surfoq	42,109	73,127
Sfscupbsb	1,534	348
Tilefish	43,856	0
Other	35,467	3,001,890

Vessels by Year

Table 115 Gloucester Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value (Millions of $)	Landed port value (Millions of $)
1997	277	216	15	23
1998	250	196	18	28
1999	261	199	18	26
2000	261	202	20	42
2001	295	230	19	38
2002	319	247	21	41
2003	301	225	22	28
2004	303	227	25	43
2005	292	222	35	46
2006	285	216	35	48
2007	306	239	32	47
2008	312	240	38	54
2009	320	245	36	50
2010	316	223	39	56

Recreational

The outer harbor has several mooring areas used primarily by recreational boats (Harbormasters.org, 2011http://www.harbormasters.org/). Eastern Point Yacht Club, founded in 1923, maintains a large mooring field just inside the Dog Bar breakwater. The City of Gloucester has 20 transient moorings in Southeast Harbor and many private moorings situated around Ten Pound Island. Freshwater Cove, on the western shore of the Outer Harbor, also contains private moorings. The shoreline of the Outer Harbor is dotted with private docks and piers. (The inner harbor is used primarily by the commercial fleet.) Both commercial and recreational boats use Smith Cove for mooring and dockage. The Annisquam River is a well-traveled waterway connecting Gloucester Harbor with Ipswich Bay. Cape Ann Marina and Gloucester Marina, located at the southern end of the river, provide dockage for several hundred

commercial and recreational boats. There are numerous moorings just outside the channel limits all along the river, and many private docks and piers exist along its shore. Lobster Cove is located inside the Ipswich Bay entrance of the Annisquam River and contains an extensive mooring area, the Annisquam Yacht Club, Lobster Cove Market and Marina and many smaller private docks.

Eight companies are listed on a Cape Ann website as running fishing charters out of Gloucester (a reduction of two since 2006) (www.cape-ann.com, 2011)

Subsistence

Information on subsistence fishing in Gloucester is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Gloucester is an important community involved in the Atlantic herring fishery. It meets several criteria identified in in Section 5.5.3.2 of this document (communities of interest): #1 (herring landings), #2 (herring-related infrastructure), #3 (lobster/tuna bait dependence), and #5 (value-added production). 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. Gloucester's infrastructure includes shipping terminals and access to major highways and nearby airports. The port also provides many additional fishing-related services including ice, fuel, and vessel maintenance/repair services.

Gloucester was the top-ranked port for herring landings in 2004 (26,891 mt) and cumulatively from 1995-2004 (227,579 mt).

During the 300 years of fishermen's residence in Gloucester before the first beam trawler was built in Bath, Maine in 1918, fishermen caught cod and other favored species with baited hooks. Herring was often the bait of choice. With more than 400 schooners regularly sailing from Gloucester in the early 1800s, carrying thousands of fishermen who worked with hooks and lines, the clam-flats could not supply the insatiable market for bait, so fishermen turned to herring (Garland, 1995).

In the late 1960s and 1970s, the distant water fleets of USSR, German Democratic Republic and nine other countries were joined by Gloucester fishing boats in harvesting herring on Georges Bank. The pressure led to the collapse of the stocks and no commercial landings for 15 years. Eventually, however, the stocks began to rebuild.

In 1993, the Conservation Law Foundation indicated that with research, planning and investment, Gloucester could successfully return to an emphasis on herring. By October 1996, Gloucester appeared poised to take advantage of the healthy herring stocks. Eleven companies and/or organizations formed the Gloucester Herring Corporation and each put up funds to match for a $400,000 grant from US Economic Development Agency (EDA) to explore the potential for herring in Gloucester. The challenge was to increase the harvest of herring; expand and improve shoreside facilities; and open the global market to Gloucester herring.

Redevelopment of the Herring Fishery

A variety of efforts were made to develop the full range of commercial activities: harvesting, processing and marketing to both bait and food markets. One major initiative in 1996 planned to allow a Dutch company to build a facility on the State Fish Pier that would work with the F/V Atlantic Star, a 369-foot factory trawler. A grassroots organization, Gloucester Initiatives, with the help of Congress successfully

blocked this effort, arguing that a fleet of medium-sized vessels and local processing plants along the Atlantic coast should be cautiously developed in order to sustainably harvest, process and market herring and mackerel while maintaining a traditional fisheries "way of life."

Herring as Bait

In Gloucester, herring for bait plays a very important role in both the commercial and recreational industries. As prey, the herring attract a plethora of whales to Jefferies Ledge and Stellwagen Bank upon which the whale watch industry depends. At least five companies in Gloucester and Rockport run whale watches. In addition, Gloucester lobster fishermen depend on the harvested herring as bait for their traps and tuna fishermen use herring as bait for their lines.

Vessel Specialization

The small and medium sized vessels that dominate Gloucester's fleet have not moved into the harvesting of herring to the extent anticipated. When groundfish regulations limited the numbers of days-at-sea and large closed areas were established, many believed that herring would provide a supplement to incomes cut by the groundfish management regime. However, the low price of herring and the need for refrigerated seawater (RSW) to retain quality has led to a specialization by larger vessels (100-foot range) dedicated to pelagics (herring and mackerel). Smaller vessels were advised not to try to retrofit their vessels with RSW systems because this would have negative impacts on stability. Rolling closures and the closure of Area 1A to trawlers during summer months further confirmed the challenges for small boats to engage in targeted herring fishing. There are a few smaller vessels that do include herring as part of their mix of targeted species.

Star Fisheries

Star Fisheries is a family-owned business that opened Gloucester's display auction. To avoid any appearance of impropriety, the family is no longer personally involved in the buying and selling of groundfish. They did however decide to retain their option for the handling of herring and mackerel since the auction is not working with pelagic species. In 2005, they packed mackerel for the first time since the opening of the auction in 1999.

5.5.3.2.13 New Bedford, Massachusetts

A detailed profile of New Bedford, Massachusetts, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. New Bedford's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

There are several fishing associations that aid the fishing industry in New Bedford, such as the Fisheries Survival Fund, established in 1998 to ensure the long-term sustainability of the Atlantic sea scallop fishery (Fisheries Survival Fund, 2011), U.S. North Atlantic Spiny Dogfish Association, the American Scallop Association, processors and support businesses related to the sea scallop industry (For more information, see website www.american-scallop-association.com), and the Commercial Anglers Association. The Offshore Mariner's Wives Association includes a handful of participants that organize the annual "Blessing of the Fleet."

Massachusetts Marine Fisheries Institute is dedicated to promoting sustainable fisheries through education and research. It is a collaborative partnership between the Massachusetts Division of Marine Fisheries and the Department of Fisheries Oceanography at the University of Massachusetts Dartmouth School for Marine Science and Technology, emphasizing interdisciplinary research and close cooperation with active fishermen (MMFI, 2011).

Fishing Assistance Centers

Shore Support was the primary fishing assistance center in New Bedford from 2000 to 2010, but is no longer in existence (Hall-Arbor, 2001). For a number of years, the New Bedford Fishermen and Families Assistance Center, established with emergency funding in response to major changes in fishing regulations promoted job retraining and provided other help to fishing families. In 1997, the Fishing Partnership Health Plan was established that not only helped fishing families to obtain subsidized health care, but also had a staff involved in other outreach efforts. The FPHP announced in May 2011 that the costs are unsustainable and the health care plan will cease on June 30, 2011. Staff will remain available to help fishing families transition to other health insurance programs, as well as provide services such as access to fishing vessel safety training (Gains, 2011).

Other Fishing-Related Organizations

There are several other fishing related organizations and associations that are vital to the fishing industry such as the Fisheries' Survival Fund (Fairhaven), the New Bedford Fishermen's Union, and New Bedford Mayor Scott Lang's Seafood Council.

In addition, Saving Seafood is a non-profit corporation funded by the seafood industry that conducts media and public outreach on behalf of the seafood industry, as well as communications to keep industry members aware of issues and events of concern (Saving Seafood, 2011).

Commercial

The fishing industry in New Bedford has consistently experienced decadal change. In the 1980s fishermen reaped high landings and bought new boats. Then in the 1990s they experienced a dramatic decrease in groundfish catches, a vessel buyback program, and strict federal regulations in attempts to rebuild the depleted fish stocks. A new decade brought more changes for the fishing industry. By 2000 and 2001 New Bedford was the highest value port in the U.S. (generating $150.5 million in dockside revenue) (For more information see website www.fishresearch.org). Revenues have continued to rise, generating $249.2 million in 2009 (NOAA Fisheries, 2010). New Bedford's most successful fishery for the last decade has been scallops, followed by groundfish.

In 1999, New Bedford had approximately 44 fish wholesale companies, 75 seafood processors and some 200 shoreside industries (Hall-Arbor, 2001). Maritime International, also located in New Bedford, has one of the largest U.S. Department of Agriculture-approved cold treatment centers on the East Coast. In 2005 the terminal received approximately 25 vessels a year. Each vessel carried about 1,000 tons of fish (Maritime International, Inc, 2011).

Landings by Species – State Only Permits

Table 116 Landings in Pounds for State-Only Permits in New Bedford in 2003

Species	Pounds landed
Cod**	6,311,413
Haddock**	5,949,880
Lobster***	1,168,884
Scup**	593,394
Fluke**	480,165
Crab***	315,395
Loligo Squid**	207,769
Striped Bass**	189,055
Quahog (littleneck)*	147,249
Monkfish	137,300
Conch*	136,276
Skate	121,522
Quahog (cherrystone)	113,341
Black Sea Bass**	113,071
Pollock	65,500
Quahog (Chowder)*	64,999
Bluefish**	44,045
Quahog (mixed)*	11,513
Red Hake	10,100
Cusk	1,880
Illex Squid**	1,305
Soft Shell Clam*	985
Dab (Plaice)	870
Dogfish**	537
Winter Flounder	500
Yellowtail Flounder	383
Gray Sole (Witch)	200

Asterisks indicate data sources: Zero: MA DMF has 2 gear-specific catch reports: Gillnet & Fish Weirs. All state-permitted fish-weir and gillnet fishermen report landings of all species via annual catch reports. NOTE: Data for these species do not include landings from other gear types (trawls, hook & line, etc.) and therefore should be considered as a subset of the total landings. (Massachusetts Division Marine Fisheries).

Landings by Species – Federal Permits

Table 117 New Bedford Average Annual Value 1997-2008

Catch	1997-2008 Average ($)	2002 ($)
Scallops	156,996,744	96,577,150
Largemesh	34,041,406	40,950,557
Monkfish	10,308,258	6,545,695
Surfoq	10,571,831	6,772,070
Other	4,516,185	5,285,072
Lobster	5,973,191	6,395,289
Skates	2,829,983	1,420,409
SFSCUPBSB	1,735,904	1,040,050
Red crab	1,015,717	1,948,522
MSB	2,330,872	782,113
Smallmesh	1,393,381	871,565
Herring	1,607,356	738
Dogfish	95,344	9,415
Bluefish	13,038	13,361
Tilefish	2,886	0

Vessels by Year

Table 118 New Bedford Vessel Permits/Landings Values 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port value ($)	Landed port value ($)
1997	244	162	80,472,279	103,723,261
1998	213	137	74,686,581	94,880,103
1999	204	140	89,092,544	129,880,525
2000	211	148	101,633,975	148,806,074
2001	226	153	111,508,249	151,382,187
2002	237	164	120,426,514	168,612,006
2003	245	181	125,788,011	166,680,126
2004	255	180	160,643,818	206,431,754
2005	275	196	205,246,945	136,500,469
2006	279	201	191,018,177	281,716,674
2007	278	212	183,142,718	267,261,329
2008	280	218	185,820,356	239,889,326
2009	273	220	182,559,938	246,198,425
2010	262	210	225,763,117	303,964,574

Recreational

Five companies are listed in a New Bedford visitor's guide as offering the public recreational fishing excursions including boat charters, though two of these are actually across the harbor in Fairhaven and one is in E. Wareham (New Bedford Area Visitor Guide, 2011).

Subsistence

Information on subsistence fishing in New Bedford is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

New Bedford is an important community involved in the Atlantic herring fishery. It meets several criteria identified in in Section 5.5.3.2 of this document (communities of interest): #1 (herring landings), #2 (herring-related infrastructure), #3 (lobster/tuna bait dependence), and #5 (value-added production). Several lobster bait dealers and a pumping station for offloading herring are located in New Bedford. In addition, NORPEL, considered one of the largest processors of herring for frozen export, is located in New Bedford and was leasing several dedicated pelagic fishing vessels. NORPEL, however, in 2011 is in limbo with most staff dismissed and at least one of the leased vessels has returned to the West Coast. New Bedford's infrastructure includes shipping terminals (Maritime International) and access to major highways and nearby airports. The port also provides many additional fishing-related services including ice, fuel, and vessel maintenance/repair services.

New Bedford ranked fourth in herring landings in 2004 (7,791 mt) and seventh cumulatively from 1995-2004 (31,089 mt,). Herring landings in New Bedford increased significantly with the establishment of the NORPEL plant, but the plant is currently (June 2011) closed.

5.5.3.2.14 Point Judith, Rhode Island

A detailed profile of Point Judith, Rhode Island, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Point Judith's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

The Commercial Fisheries Center of Rhode Island was founded to preserve commercial fishing as a profession, culture, and way of life through promoting the sustainability of the resource (Rhode Island Science & Technology Advisory Council, 2011).

Members include:

- RI Party and Charter Boat Association
- Point Judith Fishermen's Memorial Foundation
- Point Judith Fishermen's Scholarship Foundation
- Atlantic Offshore Lobstermen's Association
- Ocean State Fishermen's Association

- Rhode Island Commercial Fishermen's Association
- Rhode Island Lobstermen's Association
- Rhode Island Shellfisherman's Association
- RI Monkfishermen's Association
- Sakonnet Point Fishermen's Association
- Commercial Fisheries Research Foundation
- Eastern New England Scallop Association

The American Seafood Institute, a nonprofit established in 1982, provides assistance to the fishing industry in exporting product overseas.

Fishing Assistance Centers

Although based in Providence, the Rhode Island Science and Technology Advisory Council, launched in 2005, is working to increase RI's research and development capacity, etc. acts as an informational clearinghouse, among other activities, including information on Requests for Proposals for collaborative fisheries research (Rhode Island Science & Technology Advisory Council, 2011). Commercial Fisheries Research Foundation of Rhode Island has been administering federal funding for cooperative fisheries research since 2008 under the Southern New England Collaborative Research Initiative (SNECRI) program.

Founded in 1964, the Rhode Island Marine Trades Association represents all aspects of the marine industry. Member companies and organizations are dedicated to the growth in recreational boating and the creation of jobs for our industry in an environmentally friendly, safe and responsible way (Rhode Island Marine Trades Association, 2011).

The Point Club is the largest organized fishing vessel mutual insurance club on the East Coast. In 2006, it started subsidizing the cost of adding selected new safety equipment on fishing vessels.

Commercial

In 2003, the number of commercial vessels in Pt. Judith was 224 (RI DEM, 2003). Vessels ranged from 45-99 feet, with most being ground trawlers. Of these, 55 were between 45 and 75 feet, and 17 over 75 feet (Hall-Arbor, 2001). In 2001, Point Judith was ranked 16th in value of landings by port (fourth on the East Coast). In 2009, Point Judith landed 39.9 million pounds of fish (ranked 23rd in the nation), valued at $32.4 million (ranked 20th in the nation) (NOAA Fisheries, 2010).

RI Department of Environmental Management holds title over the majority of the land and Narragansett has worked with the State to create protection for the port for commercial fishing and other maritime uses. RI DEM regards the commercial fishing industry as the priority use for the port (Rhode Island Sea Grant, 2011).

The state's marine fisheries are divided into three major sectors: shellfish, lobster, and finfish. The shellfish sector includes oysters, soft shell clams, and most importantly, quahogs. The lobster sector is primarily comprised of the highly valued American lobster with some crabs as well. The finfish sector targets a variety of species including winter, yellowtail and summer flounder, tautaug, striped bass, black sea bass, scup, bluefish, butterfish, squid, whiting, skate, and dogfish. A wide range of gear including otter trawl nets, floating fish traps, lobster traps, gill nets, fish pots, rod and reel, and clam rakes are used to harvest these species. The state was issuing about 4,500 commercial fishing licenses at the time of this report (Hall-Arber, 2001).

Landings by Species

Table 119 Narragansett (Point Judith) Average Annual Dollar Value of Landings by Species 1997-2008

	Annual Average 1997-2008	2002 only
Lobster	11,803,812	8,116,261
MSB	12,046,408	8,804,396
Sfscupbsb	5,859,644	4,603,074
Smallmesh	2,998,544	1,760,782
Monkfish	2,845,219	2,315,556
Largemesh	2,861,395	2,637,144
Other	2,839,344	2,162,004
Skates	771,819	598,998
Herring	528,394	66,637
Scallops	1,772,585	79,899
Tilefish	203,104	0
Bluefish	126,648	139,695
Dogfish	52,684	56,891
Red crab	8,111	135

Vessels by Year

Table 120 Narragansett (Point Judith) Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port Value ($)	Landed Port value ($)
1997	21	61	5,629,991	0
1998	25	55	5,926,038	0
1999	27	60	7,650,042	0
2000	32	61	7,902,294	0
2001	30	62	6,194,920	0
2002	29	53	7,935,212	0
2003	30	52	9,314,990	0
2004	183	50	37,385,954	35,363,351
2005	191	51	39,502,317	38,208,292
2006	187	49	41,633,642	46,793,527
2007	194	46	37,109,056	36,735,513
2008	183	41	37,206,023	37,026,703
2009	178	38	32,041,429	32,361,145
2010	175	38	32,399,902	31,857,371

Recreational

Rhode Island marine waters also support a sizable recreational fishing sector. While accurate data on this component is lacking, it is estimated that in the year 2000, some 300,000 saltwater anglers, most from out-of-state, made 1 million fishing trips. This indicates that the recreational component is significant both in terms of the associated revenues generated (support industries) and harvesting capacity.

Subsistence

No information has been obtained at this time on subsistence fishing.

Atlantic Herring Fishery

Point Judith is marginally involved in the Atlantic herring fishery; landings of herring in Point Judith were much higher in the early 1990s; this may be due to increased participation in the Atlantic mackerel fishery. Several lobster bait dealers are located in Point Judith, and some herring is trucked to Maine from Point Judith for processing.

Point Judith ranked 10th in herring landings in 2004 (2,129 mt) and fourth cumulatively from 1995-2004 (71,289 mt).

5.5.3.2.15 Newport, Rhode Island

A detailed profile of Newport, Rhode Island, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Newport's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

There are several fishing associations that aid the fishing industry in Newport. The Ocean State Fishermen's Association is located in Barrington; the Rhode Island Commercial Fishermen's Association, as well as the Rhode Island Lobstermen's Association are in Wakefield. The State Pier 9 Association and Atlantic Offshore Fishermen's Association are involved in the Newport's fishing industry (Hall-Arbor, et al., 2001).

Other Fishing-Related Institutions

The Seamen's Church Institute is an organization that brings soup around to the docks for workers and fishermen.

Commercial

In 2002, recorded annual landings for Rhode Island totaled 103.5 million pounds with a landing value of $64.2 million, with catches of Atlantic herring and Atlantic mackerel at 12.7 and 20.9 million pounds landed (NOAA Fisheries, 2003). Newport's annual landed value for 2002 was $7.5 million including an annual lobster landed value of $2.6 million, which represented about 11.7% of the 2002 state annual landings.

The South of Cape Cod midwater trawl fleet (pair and single) consists of eight vessels with principal ports of New Bedford, MA; Newport, RI; North Kingstown, RI; and Point Judith, RI. This sector made 181 trips and landed 17,189 mt of herring in 2003. Maine had the highest reported landings (46%) in 2003, followed by Massachusetts (38%), New Hampshire (8%), and Rhode Island (7%).

Infrastructure

State Pier Number 9 is owned and maintained by the State. The pier is zoned commercial/industrial and is managed by RI DEM to be principally a fishing pier. Only commercial fishing vessels are allowed to tie up at the pier and the two-finger pier on the southern side. Most of the fishing vessels are lobster boats and draggers. The pier also provides space for gear storage, net mending and offloading (RI Sea Grant, 2011).

Long Wharf is city owned and designated for commercial fishing boat dockage but the water is shallow and no longer practical for most vessels. Fishing boats sill tie up on the Southside of Aquidneck Lobster pier.

Landings by Species

Table 121 Newport Dollar Values of Landings by Species 1997-2008

	Average Annual 1997-2008	2002 only
Other Species	561,091	85,085
L Mesh	955,647	428,723
S Mesh	158,038	134,958
Dogfish	28,833	724
Scallops	2,813,895	5,475,872
Lobster	3,288,484	733,090
Tilefish	7,929	0
Monkfish	888,672	293,733
Herring	82,262	3,044
Bluefish	11,418	7,198
Skates	156,108	1,42,389
MSB	1,342,883	554,339
Sfscupbsb	7,697	620,404

Vessels by Year

Table 122 Newport Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port Value ($)	Landed port Value ($)
1997	52	13	5,130,647	7,598,103
1998	52	16	6,123,619	8,196,648
1999	52	14	6,313,350	8,740,253
2000	59	14	6,351,986	8,296,017
2001	52	15	5,813,509	7,485,584
2002	55	17	6,683,412	7,567,366
2003	52	16	7,859,242	9,082,560
2004	53	16	6,031,391	8,402,598
2005	56	17	6,170,896	14,279,861
2006	48	19	7,080,630	20,821,160
2007	46	20	6,583,056	12,366,585
2008	44	16	5,262,698	6,765,771
2009	41	17	5,220,885	7,162,190
2010	40	18	6,045,216	6,786,625

Recreational

Information on recreational fishing in Newport is either unavailable through secondary data collection or the practice does not exist.

Subsistence

Information on subsistence fishing in Newport is either unavailable through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

Newport is marginally involved in the Atlantic herring fishery. Newport ranked 15th in herring landings in 2004 (313 mt) and 17th cumulatively from 1995-2004 (3,757 mt).

5.5.3.2.16 North Kingstown, Rhode Island

A detailed profile of North Kingstown, Rhode Island, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. North Kingstown's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

Rhode Island Fishermen's Alliance's "mission is to educate the consumer and make a stand against these regulations that will ultimately destroy the fishing industry and our access to fresh local caught seafood" (Rhode Island Fishermen's Alliance, 2011). Rhode Island Commercial Fishermen's Association formed in 2000 and located in Wakefield includes fishermen, dealers, suppliers and others. The goals of the association are to reach consensus on issues, improve working relationships with state and local officials, harvest fish sustainably, obtain quota for Rhode Island fishermen, and have impute in management regulations. Other associations with membership in North Kingstown include Rhode Island Lobstermen's Association (Rhode Island Lobstermen's Association, 2011), Rhode Island Shellfishermen's Association, Ocean State Fisherman's Association, Ocean State Aquaculture Association, and Rhode Island Salt Water Anglers Association (Rhode Island Saltwater Anglers, 2011).

Fishery Assistance Centers

Information on fishery assistance centers in North Kingstown is either unavailable through secondary data collection or does not exist.

Other Fishing-Related Institutions

The American Seafood Institute, an offshoot of R.I. Seafood Council, was formed in 1982 for overseas promotion and export assistance programs (Hall-Arbor, 2001).

Commercial

In 2002 recorded annual landings for Rhode Island totaled 103.6 million pounds with a landing value of $64.2 million (NOAA Fisheries, 2003). By 2009, quantities had decreased to 84l5 million pounds with a value of $61.6 million (NOAA Fisheries, 2010). North Kingstown's annual landing value for 2002 was $7.1 million including an annual herring landing value of $1.2 million, and an annual lobster landing value of 744,757. In 2002, the value of landings at the dealer-reported port was of $7.1 million.

The South of Cape Cod midwater trawl fleet (pair and single) consists of eight vessels with principal ports of New Bedford MA, Newport RI, North Kingstown RI, and Point Judith RI. This sector made 181 trips and landed 17,189 mt of herring in 2003. Maine had the highest reported landings (46%) in 2003, followed by Massachusetts (38%), New Hampshire (8%), and Rhode Island (7%).

Landings by Species

Table 123 North Kingstown Dollar Values of Landings by Species 1997-2008

Catch	Annual Average 1997-2008	2002
Other	1,370,816	4,824,312
Herring	849,529	1,244,586
Lobster	366,807	744,757
MSB*	9,616,464	301,531
Sfscupbsb**	66,046	28,141
Monkfish	16,725	1,307
Scallops	26,006	982
Bluefish	1,054	568
Smallmesh***	5,224	542
Largemesh****	4,048	540
Skates	168	0

** MSB: Butterfish, Mackerel, and Squid*
*** Sfscupbsb: Summer Flounder, Scup, and Black Sea Bass*
**** Smallmesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting)*
***** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock*

Vessels by Year

Table 124 North Kingston Vessel Permits/Landings Value 1997-2010

Year	# Vessels Home ported	# Vessels (Owner's city)	Home port Value ($)	Landed port Value ($)
1997	3	23	0	12,666,980
1998	2	20	0	9,322,636
1999	3	21	0	6,992,943
2000	3	23	0	8,522,877
2001	2	21	0	9,754,132
2002	2	22	0	7,147,266
2003	2	20	0	8,513,069
2004	19	24	12,981,061	16,682,612
2005	18	23	11,420,269	13,716,149
2006	18	22	10,593,598	12,994,377
2007	18	23	6,643,201	10,241,467
2008	17	21	7,361,281	10,751,288
2009	13	16	8,802,325	11,751,273
2010	14	18	6,645,654	9,784,945

Recreational

Narragansett Bay attracts a variety of recreational fishermen. These fishermen fish a variety of species including quahogs, bluefish and striped bass. A report (no longer available on the web) from University of Rhode Island's Graduate School of Oceanography said that Rhode Island recreational anglers spent $138,737,000 in 1998. In 2010, approximately 49,974 individuals bought Recreational Salt Water Fishing licenses (Rhode Island or federal).

Subsistence

Information on subsistence fishing in North Kingstown is either not available through secondary data collection or the practice does not exist.

Atlantic Herring Fishery

North Kingstown is involved in the Atlantic herring fishery primarily through its involvement in the bait fishery. 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 Kingstown ranked 12th in herring landings in 2004 (1,065 mt) and fifth cumulatively from 1995-2004 (69,094 mt).

5.5.3.2.17 Cape May, New Jersey

A detailed profile of Cape May, New Jersey, including important social and demographic information, is provided in "Community Profiles for the Northeast US Fisheries", by Clay et al., and can be accessed at www.nefsc.noaa.gov/read/socialsci/community_profiles. Cape May's involvement in fisheries is summarized below.

Involvement in Northeast Fisheries

Institutional

Fishing Associations

Garden State Seafood Association in Trenton is a statewide organization of commercial fishermen and fishing companies, related businesses and individuals working in common cause to promote the interests of the commercial fishing industry and seafood consumers in New Jersey (Garden State Seafood Association, 2011). The Recreational Fishing Alliance, a national, grassroots political action organization representing recreational fishermen and the recreational fishing industry on marine fisheries issues, has members in Cape May.

Fishery Assistance Centers

In 1984 Cape May County received a $500,000 EDA grant to help the commercial fishing industry. The Revolving Fishing Loan Program that allows boat owners to borrow money at a lower interest rate than is available from banks is still in existence.

Other Fishing-Related Institutions

Information has not yet been collected regarding other fishing related institutions in Cape May.

Commercial

At the Southernmost tip of New Jersey – and almost as far South as Washington, DC – the combined port of Cape May/Wildwood is the largest in New Jersey and one of the largest on the East Coast. The center of fish processing and freezing in New Jersey, Cape May/Wildwood is the homeport to some of the largest vessels fishing on the Atlantic coast and has led the way in developing new fisheries and new domestic and international markets for New Jersey seafood. Major Cape May fisheries focus on squid, mackerel, fluke, sea bass, porgies, lobsters and menhaden. In addition to these, Wildwood boats are also in the surf clam/ocean quahog fisheries. Like many Jersey Shore communities, much of Cape May's and Wildwood's economies are dependent on seasonal tourism – which is dependent both on the weather and the overall state of the economy. The year-round character of commercial fishing is a major factor in keeping these communities going in the off-season (Garden State Seafood Association, 2011).

In 2002, recorded annual landings for New Jersey totaled 162.2 million pounds with a landing value of $112.7 million (NOAA Fisheries, 2003). Cape May annual landing value for 2002 was $28.2 million including an annual scallop landing value of $19.8 million. In 2009 Cape May-Wildwood's annual landing was 63.9 million pounds, down from 82.9 million pounds in 2008. However, the value of the landings was 73.7 million in 2008, 73.4 million in 2009 (NOAA Fisheries, 2010). The herring landing value in 2002 represented 6% of the 1997-2003 average. In 2002, the value of landings at dealer-reported port was of $28.3 million, and the landed value of home-ported vessels was of $34.5 million. Between 1997 and 2003 home ported vessels number increased from 109 to 129.

Landings by Species

Table 125 Cape May Dollar Values of Landings by Species 1997-2008

Catch	Annual Average 1997-2008	2002
Scallops	36,587,620	19,806,595
MSB*	8,185,054	3,281,558
Sfscupbsb**	2,208,790	1,391,629
Other	2,220,645	1,488,759
Surfoq***	490,246	1,796,269
Lobster	554,044	340,381
Monkfish	348,774	107,474
Herring	315,261	55,871
Smallmesh****	21,857	2,778
Bluefish	23,346	23,628
Skates	11,144	16,272
Dogfish	5,650	0
Largemesh*****	9,796	37,711
Tilefish	963	2,938

Source: NMFS Landings and Permit databases
** MSB: Butterfish, Mackerel, and Squid*
*** Sfscupbsb: Summer Flounder, Scup, and Black Sea Bass*
**** Surfoq: Surf Clam and Ocean Quahog*
***** Smallmesh Multi-species: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting)*
****** Largemesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and pollock*

Vessels by Year

Table 126 Cape May Vessel Permits/Landings Value 1997-2010

Year	# Vessels home ported	# Vessels (owner's city)	Home port Value ($)	Landed port Value ($)
1997	109	73	27,687,667	23,636,983
1998	105	68	27,614,763	25,770,007
1999	106	72	29,153,706	22,353,284
2000	116	74	30,488,271	23,936,235
2001	116	71	32,923,798	27,155,864
2002	118	72	34,529,920	28,312,296
2003	129	78	42,696,341	36,368,698
2004	142	84	64,995,256	60,629,161
2005	170	93	76,020,057	63,152,544
2006	193	94	71,926,998	34,636,597
2007	203	95	80,942,293	52,886,077
2008	188	93	75,458,775	69,388,147
2009	182	91	77,559,019	67,331,992
2010	175	99	91,120,004	76,641,507

Recreational

The Cape May County Charter and Party Boat Association has more than 85 charter and party boats that can take anglers ocean and bay fishing all year long (Cape May County, 2006). Striper fishing charters are a major attraction in New Jersey and anglers flock to the Jersey coast year after year from regions around the world to experience the fall striper runs New Jersey is famous for (www.fintalk.com, 2011).

Subsistence

Information on subsistence fishing in Cape May is either available through primary data collection or the practice does not exist.

Atlantic Herring Fishery

Cape May is involved in the Atlantic herring and other pelagic fisheries. A pumping station for offloading herring and a processing plant are located in Cape May. Lund's Fisheries, a processor of herring and mackerel, is located in Cape May and owns several dedicated pelagic fishing vessels. The port also provides many additional fishing-related services including ice, fuel, and vessel maintenance/repair services.

Herring landings in New Jersey were 68,301,000 pounds in 2007, went up to 80,610,000 pounds in 2008 and down to 72,709,000 pounds in 2009 and lower still to 56,306,000 pounds in 2010.

6.0 ENVIRONMENTAL CONSEQUENCES OF MANAGEMENT ALTERNATIVES UNDER CONSIDERATION

The impacts of the management measures proposed by the Council in Amendment 5 are assessed and discussed relative to each of the valued ecosystem components (VECs) described in the Affected Environment (Section 5.0).

Much of the detailed analysis to support the development of the alternatives considered by the Council in Amendment 5 was provided by the Herring PDT and forms 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 to this amendment (Volume II) and are summarized below and incorporated by reference where appropriate.

6.1 IMPACTS OF PROPOSED ADJUSTMENTS TO FISHERY MANAGEMENT PROGRAM (SECTION 3.1)

The Council considered a range of management alternatives to enhance the Atlantic herring fishery management program in general; measures addressed in this section include proposed regulatory definitions, administrative/general provisions, changes to reporting requirements, trip notification requirements, and open access permit provisions. The potential impacts of these measures/options on the VECs identified in this amendment are discussed in the following subsections. The Council's ***Preferred Alternatives*** are identified throughout the discussion.

6.1.1 Impacts of Regulatory Definitions and Administrative/General Provisions (Sections 3.1.1 and 3.1.2)

Options Under Consideration:

- No Action (Status Quo)
- Regulatory Definitions for *Transfer at Sea* and *Offload* ***(Preferred Alternative)***
- Clarify that vessels working cooperatively in a multi-vessel operation are limited to the vessels' most restrictive possession limit ***(Preferred Alternative)***
- Eliminate the VMS power down provision for limited access herring vessels ***(Preferred Alternative)***
- Establish a new At-Sea Herring Dealer Permit ***(Preferred Alternative)***

Because these measures are largely administrative in nature, their impacts on the Amendment 5 VECs are expected to be relatively minor and are discussed collectively in this section.

The regulatory definitions and administrative/general provisions proposed in Amendment 5 relate to the overall goal of the amendment, which is to improve catch monitoring and ensure compliance with the MSA. They also relate indirectly to the first objective, which is to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery (to the extent that they clarify provisions and are intended to improve compliance/enforcement).

6.1.1.1 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to the proposed adjustments to the fishery management program and administrative/general provisions would not be expected to affect the status of the herring resource, and the no action option is expected to have a neutral impact on herring. Some of the indirect long-term benefits from the options under consideration would not be realized under the no action option; as discussed below, the options are expected to have low positive impacts on the resource.

The ***Preferred Alternatives*** include new regulatory definitions and a suite of administrative/general provisions. Because all of these measures are administrative in nature, they are very unlikely to affect the amount of herring available for harvest, fishing effort, or fishing behavior. The impacts of these options are likely to yield no direct impacts to the Atlantic herring resource.

There may, however, be some indirect positive impacts on the herring resource from implementing the proposed changes. The proposed regulatory definitions and administrative/general provisions may reduce the likelihood for errors reporting, and consequently, in the calculation of catch statistics. If catch statistics improve by implementing the proposed adjustments, then management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty. This will lead to more effective long-term management of the resource and therefore result in minor indirect benefits. Relative to taking no action, impacts of the options under consideration relate to the following:

- Regulatory Definitions for *Transfer at Sea* and *Offload* ***(Preferred Alternative)***– clarifying regulatory definitions may reduce any ambiguity related to the options under consideration in Section 3.1.3 (Measures to Address Carrier Vessels) and any other relevant management measures, which, in turn, may reduce the likelihood for misallocating or double counting herring catches;
- Clarify that vessels working cooperatively in a multi-vessel operation are limited to the vessels' most restrictive possession limit ***(Preferred Alternative)***– this measure was proposed by NMFS for consideration in Amendment 5 and may improve enforcement of herring possession limits in multi-vessel operations;
- Eliminate the VMS power down provision for limited access herring vessels ***(Preferred Alternative)***– this provision is proposed for consistency across limited access management programs in the Northeast Region, and to improve the enforceability of catch monitoring;
- Establish a new At-Sea Herring Dealer Permit ***(Preferred Alternative)***– establishing this permit may reduce any ambiguity related to the options under consideration in Section 3.1.3 (Measures to Address Carrier Vessels) and improve reporting of herring catch by dealers and carrier vessels. It

may reduce instances where catch is mistakenly attributed to a carrier vessel on a dealer report and then cannot be matched to a vessel trip report (VTR). During final decision-making, the Council clarified that this permit would be required for Atlantic herring carrier vessels that sell fish at-sea.

Overall, because of the administrative nature of the options proposed in this section and the resulting benefits from reducing errors in reporting, the impacts on the Atlantic herring resource should be *low positive* relative to taking no action.

6.1.1.2 Impacts on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment). Because of the nature of the measures under consideration in this section, selection of the no action option relative to the proposed regulatory definitions and administrative/general provisions would not be expected to affect non-target species and other fisheries.

All of the options considered in this section are administrative and are very unlikely to affect the amount of herring available for harvest, fishing effort, or fishing behavior. The options also focus on provisions related to fishing for Atlantic herring and do not address, directly or indirectly, issues related to the catch of non-target species or other fisheries. Therefore, it is highly likely that there would be no impacts to non-target species and other fisheries expected from the ***Preferred Alternatives*** in this section, with respect to the no action option. The impacts of both the proposed regulatory definitions and administrative/general provisions on non-target species and other fisheries are considered *neutral*.

6.1.1.3 Impacts on Physical Environment and EFH

The ***Preferred Alternatives*** in this section include updates to definitions of 'transfer at sea' and 'offload', clarification about possession limits for vessels fishing cooperatively, changes to VMS requirements, and changes to dealer permitting. None of the options being proposed are expected to affect the amount or location of herring fishing effort. Thus, none of the proposed measures would have any adverse effects on EFH. The no action option would maintain status quo, and because the impacts of the measures are likely to be neutral, there is no expected difference between the no action option and the measures presented with respect to EFH. Thus, none of the proposed measures would have any adverse effects on EFH.

6.1.1.4 Impacts on Protected Resources

The proposed regulatory definitions, changes to operational requirements in the fishery, and dealer permits are administrative in nature from the standpoint of protection and monitoring of protected resources in the area; therefore they are not likely to have any effect on protected resources. The no action option would maintain status quo, and because the impacts of the measures are likely to be negligible, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area. Impacts of the proposed measures are considered neutral.

6.1.1.5 Impacts on Fishery-Related Businesses and Communities

Because of the administrative nature of the measures under consideration in this section, selection of the no action option relative to the proposed regulatory definitions and administrative/general provisions would not be expected to affect fishery-related businesses and communities. Some of the indirect long-term benefits from the proposed definitions and administrative/general provisions would not be realized under the no action option, but, as discussed below, the provisions under consideration are expected to have low positive impacts on fishery-related businesses and communities.

As discussed in Section 6.1.1.1, the ***Preferred Alternatives*** may contribute to reducing the likelihood for errors in the calculation of catch statistics. As reporting and compliance improves, management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). More specifically:

- Regulatory Definitions for *Transfer at Sea* and *Offload* ***(Preferred Alternative)***– clarifying regulatory definitions may reduce any ambiguity related to the options under consideration in Section 3.1.3 (Measures to Address Carrier Vessels) and any other relevant management measures, which, in turn, may reduce the likelihood for misallocating or double counting herring catches;
- Clarify that vessels working cooperatively in a multi-vessel operation are limited to the vessels' most restrictive possession limit ***(Preferred Alternative)***– This measure was proposed by NMFS for consideration in Amendment 5 and may improve enforcement of herring possession limits in multi-vessel operations. The impacts of this measure on fishery-related businesses and communities is neutral;
- Eliminate the VMS power down provision for limited access herring vessels ***(Preferred Alternative)***– This provision is proposed for consistency across limited access management programs in the Northeast Region, and to improve the enforceability of catch monitoring in the herring fishery. The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At that time, the Enforcement Committee agreed by consensus to support eliminating the VMS power down provision because it would make provisions for herring limited access vessels consistent with other limited access vessels and would enhance enforcement of the herring regulations.
- Establish a new At-Sea Herring Dealer Permit ***(Preferred Alternative)***– Establishing this permit may reduce ambiguity related to the options under consideration in Section 3.1.3 (Measures to Address Carrier Vessels) and improve catch reporting by requiring a report for each purchase (including at-sea purchases). It will, however, increase the reporting burden for vessels that obtain this permit. During final decision-making, the Council clarified that this permit would be required for Atlantic herring carrier vessels that sell fish at-sea. Section 6.1.2.1.5 of this document (Impacts of Measures to Address Carrier Vessels on Fishery-Related Businesses and Communities) provides information about the number of vessels engaged in carrying activities.

Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term. To the extent that scientific and management uncertainty can be reduced, additional yield can be made available to the herring fishery. The long-term impacts of reducing scientific and management uncertainty are positive for fishery-related businesses and communities. For the most part, though, all of the options considered in this section are administrative and are very unlikely to affect the amount of herring available for harvest, fishing effort, or fishing behavior. Therefore, impacts on fishery-related businesses and communities associated with implementing the ***Preferred Alternatives*** in this section are expected to be very minor, and relative to taking the no action option, should be *low positive*, due to the potential minor improvements to catch reporting.

6.1.2 Impacts of Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea (Sections 3.1.3)

6.1.2.1 Impacts of Measures to Address Carrier Vessels

Options Under Consideration:

- Option 1: No Action (Status Quo)
- Option 2: Require VMS on Carrier Vessels for Declaration Purposes and Eliminate Seven-Day Enrollment Period (Section 3.1.3.2.2)
- Option 3: Dual Option for Carriers – Use VMS for Declaration Purposes and Eliminate Seven-Day Enrollment Period or Status Quo (Section 3.1.3.2.3) ***(Preferred Alternative)***

6.1.2.1.1 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to the measures to address carrier vessels would not be expected to affect the status of the herring resource, and the no action option is expected to have a neutral impact on herring.

The measures to address carrier vessels are intended to provide more flexibility to vessels engaging in carrying activities. Option 2 would require a VMS on all carrier vessels, allowing these vessels to declare in and out of carrying activities on a trip-by-trip basis. For those vessels that already have VMS units on board, there would likely be no cost increase to using that unit to declare into the herring fishery as a carrier vessel. Herring limited access vessels are currently required to declare into the herring fishery at the start of every trip. This action would not increase the VMS submissions, but would only change the nature of the declaration from declaring HER-HER to HER-CAR or something similar. Option 3 ***(Preferred Alternative)*** provides the carrier with the choice of complying with current requirements or using a VMS for declaration purposes. Section 6.1.2.1.5 (Impacts of Measures to Address Carrier Vessels on Fishery-Related Businesses and Communities) suggests that a small number of vessels may be affected by these options if they choose to purchase a VMS. Because these options are largely administrative in nature and do not impact removals of Atlantic herring from the fishery, no additional impacts on the herring resource are expected, and because the impacts of the measures under consideration are likely to be *neutral*; there is no difference expected between the no action option and the options proposed for carrier vessels with respect to the Atlantic herring resource.

6.1.2.1.2 Impacts on Non-Target Species and Other Fisheries

The no action option (Option 1) would maintain status quo, and no additional impacts are expected on non-target species and other fisheries. Because the impacts of the measures are likely to be neutral (see below), there is no measureable difference expected between the no action option and the options proposed for carrier vessels with respect to the non-target species and other fisheries.

The measures to address carrier vessels are intended to provide more flexibility to vessels engaging in carrying activities. Option 2 would require a VMS on all carrier vessels, allowing these vessels to declare in and out of carrying activities on a trip-by-trip basis. For those vessels that already have VMS units on board, there would likely be no cost increase to using that unit to declare into the herring fishery as a carrier vessel. Herring limited access vessels are currently required to declare into the herring fishery at the start of every trip. This action would not increase the VMS submissions, but would only change the nature of the declaration from declaring HER-HER to HER-CAR or something similar. Option 3 ***(Preferred Alternative)*** provides the carrier with the choice of complying with current requirements or using a VMS for declaration purposes. Section 6.1.2.1.5 (Impacts of Measures to Address Carrier Vessels on Fishery-Related Businesses and Communities) suggests that a small number of vessels may be affected by these options if they choose to purchase a VMS. The measures proposed in this section are largely administrative in nature and are not likely to affect removals of non-target species on vessels engaged in the herring fishery. Therefore, relative to the no action option, the impacts are expected to be *neutral*.

6.1.2.1.3 Impacts on Physical Environment and EFH

The carrier vessel measures in this section are not likely to influence the amount or location of herring fishing effort and, thus, would likely have no adverse effects on EFH. Therefore, relative to the no action alternative, the impacts are expected to be *neutral*.

6.1.2.1.4 Impacts on Protected Resources

From the standpoint of protection and monitoring of protected resources in the area, the change in VMS regulations (Options 2 and 3 – the ***Preferred Alternative*** is Option 3) are administrative in nature; therefore they are not likely to have any effect on protected resources. The no action option (Option 1) would maintain status quo, and because the impacts of the measures are likely to be neutral, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area.

6.1.2.1.5 Impacts on Fishery-Related Businesses and Communities

The impacts of the proposed measures to address carrier vessels are expected to be positive for vessels engaged in this activity, and overall, the impacts are expected to be insignificant across fishery-related businesses and communities affected by Amendment 5. For those vessels that already have VMS units on board, there would likely be no cost increase to using that unit to declare into the herring fishery as a carrier vessel. Herring limited access vessels are currently required to declare into the herring fishery at the start of every trip. This action would not increase the VMS submissions, but would only change the nature of the declaration from declaring HER-HER to HER-CAR or something similar.

Option 1 (No Action): Under the no action option, there is a minimum enrollment period of seven calendar days for vessels that obtain an LOA from NMFS to carry Atlantic herring. While operating under a valid LOA, such vessels are exempt from any herring possession limits associated with the herring vessel permit categories. Herring carrier vessels under an LOA may not possess, transfer, or land any species except for Atlantic herring (except that they may possess Northeast multispecies transferred by vessels issued either a Category A or B permit, consistent with the applicable possession limits for such vessels).

As compared to the status quo, the impacts on fishery-related businesses and communities are expected to be *neutral* from the no action option, as the measures described above will remain in place. However, any benefits from increased flexibility provided by the options proposed for carrier vessels would not occur if the no action option is selected. Vessels would continue to be limited by the current provisions and would not have an opportunity to use VMS to declare in/out of carrying activity. However, information provided in the analysis below suggests that the impacts of options to modify carrier provisions on fishery-related businesses and communities may be both *low negative* and *low positive*, and the number of affected vessels is likely to be small. Therefore, the impacts of the no action option with respect to the other options considered remains *neutral*.

Options 2/3 (Option 3 is the *Preferred Alternative*): While the status quo would maintain current measures, Options 2 and 3 may produce some positive impacts for vessels engaged in carrying activities because they increase flexibility and opportunities for these vessels during the time they are enrolled in herring carrying activities.

Option 2 would require a VMS on all carrier vessels, so this option may have more of an economic impact, if there are carrier vessels that do not currently utilize a VMS and would be required to purchase/maintain one in order to carry herring. Currently, all Category A, B, and C herring vessels are required to be equipped with a VMS because of VMS requirements for limited access vessels. Category A, B, and C vessels would have little pecuniary costs associated with using the VMS to declare into the fishery. The only costs for these vessels would be may be a slightly increased administrative burden, which should be small. However, the VMS provision would reduce administrative burden and regulatory costs by eliminating the seven-day enrollment period for these vessels.

Only Category D vessels that do not currently use VMS will be affected by Option 2. There may be small impacts to the Category D vessels that are not currently equipped with a VMS. Information about herring carrier vessels can be found in Section 5.5.1.3.3 of this document (Affected Environment). In 2010, there were 15 vessels that obtained a LOA from NMFS to engage in herring carrying activities (down from 18 vessels in 2009). A total of 49 reports were submitted for carrying activities by these vessels in 2010. The number of Category D (open access) vessels engaging in carrying activities increased in 2010, and the information presented in the Affected Environment suggests that about **20** Category D vessels that

have obtained carrying LOAs in the past may not be using VMS units. The costs to equip a vessel with a VMS are approximately $1,700-$3,300, with operating costs for the unit of approximately $40-$100 per month. In addition, the vessel would need a constant power source such as a generator, or access to dockside energy, that would add to the costs.

Carrier vessels would have increased flexibility so that they could declare what activity they would be engaging in on a trip-by-trip basis rather than being required to remain in one activity a week at a time. One of the most frequently lamented impacts of regulations in any fishery is the restriction on participants' ability to make quick changes in their choice of species to pursue, gear to use, and trip schedule. While this option would not remove all restrictions on such choices, it would allow carrier vessels to have more rather than less flexibility at the trip level. This flexibility could also benefit herring-dependent communities since the vessels would presumably base their choices on the needs of their community-based dealers and/or buyers.

Option 3 (Preferred Alternative) provides flexibility for vessels to either choose to obtain a VMS and eliminate the minimum seven-day enrollment period, or stay with the status quo (seven-day minimum) and not utilize VMS. Option 3 will have similar impacts on carrier vessels to Option 2; however, these impacts should be smaller because vessels may choose between the seven-day enrollment period with current LOA restrictions and using VMS to declare as a carrier vessel.

Category D vessels without a VMS would be allowed to carry herring without installing a VMS if they choose. For smaller vessels with (possibly) more limited funds, the LOA option would allow them to continue work as a carrier without increasing their costs. This is likely to be appreciated in communities with fewer alternative employment options and lower incomes.

Overall, in comparison to the no action option, the ***Preferred Alternative*** and Option 2 have the potential to create *low negative and low positive* impacts for fishery related businesses and communities. Under both options, positive impacts are likely to result from the increased flexibility and opportunities, as discussed above, but they would remain small in magnitude. On the other hand, the VMS burdens, also discussed above for Option 2, may create a low negative impact; however the impacts would similarly be small because of the small number of vessels that the option is likely to affect.

6.1.2.2 Impacts of Measures to Address Transfers of Atlantic Herring At-Sea (Section 3.1.3.3)

Options Under Consideration:

- Option 1: No Action (Status Quo, Section 3.1.3.3.1) ***(Preferred Alternative)***
- Option 2: Restrict Transfers At-Sea to Only Vessels with Category A or B Limited Access Herring Permits (Section 3.1.3.3.2)
- Option 3: Prohibit Transfers At-Sea to Non-Permitted Vessels (Section 3.1.3.3.3)

6.1.2.2.1 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option ***(Preferred Alternative)*** relative to the measures to address transfers at sea would not be expected to affect the status of the herring resource, and the no action option is expected to have a neutral impact on herring. Some of the indirect long-term benefits from the options under consideration would not be realized under the no action option, but, as discussed below, the options are expected to have very minor positive impacts on the resource.

The two options proposed to address transfers of Atlantic herring at-sea (Options 2 and 3) are not expected to directly impact the Atlantic herring resource, primarily because only small amounts of herring are transferred at-sea (see herring fishery and vessel information presented in Section 5.5.1 of this section), and the options are not expected to affect total removals of Atlantic herring from the fishery. The only difference between Option 2 and Option 3 is the number of vessels that would be restricted by the transfer-at-sea limitations.

In comparison to taking no action, there may be some indirect positive impacts on the herring resource from implementing one of the options under consideration. The measures to address transfers at sea are intended to improve accounting of herring catch by requiring that vessels making transfers have federal herring permits, thus subjecting them to VTR reporting requirements. If catch statistics improve by implementing one of the options to address transfers at sea, then management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty. This will lead to more effective long-term management of the resource. Therefore, the impacts of the options under consideration on the Atlantic herring resource may be *low positive*. The Council's rationale for selecting the no action option as the ***Preferred Alternative*** is discussed in Section 3.1.3.3.1 of this document.

6.1.2.2.2 Impacts on Non-Target Species and Other Fisheries

Because transfer at sea activity represents a very small component of the fishery (see supporting information presented in Section 6.1.2.2.5 below), the impacts of the no action option ***(Preferred Alternative)*** on non-target species and other fisheries are expected to be neutral, and the impacts of selecting one of the options to limit transfers at sea on non-target species and other fisheries are not expected to be measurably different than the no action option. The options proposed to address transfers of Atlantic herring at-sea are not likely to have a measurable impact on non-target species and other fisheries, as the amount of herring harvested is not likely to change under these options. The only difference between Options 2 and 3 is the number of vessels that would be restricted by the transfer-at-sea limitations. Therefore the impacts, when compared to the ***Preferred Alternative*** (no action), are likely to be *neutral*.

6.1.2.2.3 Impacts on Physical Environment and EFH

The transfer at sea measures in this section are intended to improve accounting of herring catch by requiring that vessels making transfers have federal herring permits, thus subjecting them to VTR reporting requirements. None of these measures are therefore likely to have any adverse effects on EFH, and relative to the no action option (***Preferred Alternative***), the impacts are expected to be *neutral* in nature.

6.1.2.2.4 Impacts on Protected Resources

The restriction of transfers at-sea (Options 2 and 3) are not likely to impact the amount or the location of effort put forth by the fishery; therefore they are not likely to have any effect on protected resources. Although monitoring of the fishery may improve through the restriction of transfers, most species classified as protected would not be influenced. The transfers under consideration occur after the protected species have been separated from the catch of herring. The no action option (Option 1, ***Preferred Alternative***) would therefore maintain status quo, and because the impacts of the measures are likely to be *neutral*, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area.

6.1.2.2.5 Impacts on Fishery-Related Businesses and Communities

Option 1 (No Action, *Preferred Alternative*): No additional impacts on fishery-related businesses and communities are expected under the no action option relative to the status quo, as current management measures would remain in place, and transfers of Atlantic herring at-sea would remain unrestricted (except for as limited by vessels' herring possession limits).

The potential impacts of limiting transfer at-sea activities are discussed below with respect to the options under consideration and are expected to be low negative for affected fishery-related businesses and communities. These impacts would result primarily from increased reporting burdens for affected vessels, and they would not be experienced under the no action option. Similarly, however, under the no action option, any benefits resulting from tightening reporting requirements and reducing potential loopholes would not be experienced under the no action option. The information in the analysis presented below suggests that this activity represents a very small fraction of the Atlantic herring fishery though, so the impacts of taking no action remain neutral.

Option 2: Fishing vessels must record if fish is "Sold to another vessel for bait or retained for bait." There are no data available for only fish which is sold to another vessel for bait. Based on the VTR information provided in Table 127, very little Atlantic herring is recorded as "sold to another vessel bait or retained for bait." Between 2005 and 2010, an average of 0.21% of all caught Atlantic herring was either transferred for bait or retained as bait.

Table 127 VTR-Reported Herring Catch (Pounds) Sold At-Sea/Retained as Bait

	No. Vessels	"Bait" either kept or sold at sea	All VTR Reported Landings	Percent "Bait"
2005	15	180,527	214,338,587	0.08%
2006	16	224,151	226,678,651	0.10%
2007	29	1,146,795	173,647,134	0.66%
2008	15	117,572	183,896,188	0.06%
2009	20	169,183	226,884,852	0.07%
2010	30	588,387	145,940,841	0.40%
		2,426,615	1,171,386,253	**0.21%**

This option is the most restrictive option under consideration to limit transfers of herring at sea and would impact three groups of vessels: Category C vessels and Category D vessels that are not operating under a Carrier LOA would be prohibited from receiving herring at-sea. In addition, vessels that currently don't possess any herring permit would be prohibited from receiving herring at-sea. Category C or D vessels operating under a Carrier LOA would be exempt from this measure and would, therefore, not be impacted by these regulations. Pair trawl vessels would also not be impacted by this provision.

Option 2 may reduce opportunities for Category C and D vessels to participate in the herring fishery by limiting their ability to transfer herring at sea (unless they are carrying herring or participating in a pair trawl operation). Because of the high cost of fuel, the requirement to return to port in order to land their catch could negatively impact herring-related businesses that have only C or D permits. Typically, smaller vessels lack refrigerated seawater (RSW) systems, so the retention of high-quality herring

depends on their ability to transfer their catch to vessels with RSW or return quickly to port. Consequently, this option could increase costs for Category C and D vessels and may limit their flexibility. Further, if the proposed definition for transfer at-sea is adopted in Amendment 5 (see Section 3.1.1), this could hamper multi-vessel purse seine operations, limiting not only opportunities for C and D vessels, but constraining the A and B permitted vessels with whom they might otherwise have worked.

The impacts of this option are therefore expected to be *low negative* for the Category C and D vessels that may be affected, with regards to the no action alternative. If requirements for carrier vessels are modified in Amendment 5 to allow for more flexibility (Options 2 and 3 for carrier vessels, proposed in Section 3.1.3.2), then more Category C/D vessels may be able to operate periodically as carriers, thereby reducing the negative impact of this option. The impacts of this option in comparison to Option 3are likely to be slightly more, as discussed below.

Option 3: This option is less restrictive than Option 2; all Category C and D vessels would be allowed to receive herring at-sea for personal use. Because permit Category D is an open access permit category, this option is minimally restrictive. Any vessel which wishes to receive herring can apply for, and obtain, an open access D permit.

However, it is slightly more restrictive than the ***Preferred Alternative*** (no action) and would create additional reporting/compliance burdens for vessels that wish to receive herring at-sea and do not have a Federal herring permit. Vessels currently with no Federal permits (recreational vessels, for example) will be required to obtain a permit for herring and comply with all related reporting requirements (including VTR and other applicable requirements implemented in this amendment).

Option 3 may improve reporting compliance as requiring a federal permit of some sort by all vessels engaged in the transfer activity reduces the likelihood that some herring catch, even in small amounts, will not be documented. However, this measure would require that vessels with no Federal permits (recreational vessels, for example) obtain a permit for herring and comply with all related reporting requirements. The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At that time, the Enforcement Committee provided the following comments regarding the measures to address transfers at-sea:

- **Option 3:** Prohibiting transfers to non-herring permit vessels is not enforceable. However, concern was expressed about the number of lobster and recreational vessels that may be affected by this option.

Under Option 3, there may be vessels that choose not to obtain a herring permit and be subject to the reporting requirements in order to transfer/receive herring at sea. The once common practice of transferring a bucket of bait between herring fishing boats and recreational vessels or others wishing to obtain herring for use as bait has become a much less frequent occurrence. Nevertheless, Option 3 could curtail this activity completely. Because the frequency has diminished, the negative impacts on herring-related businesses are likely to be small; however, the proposed restriction expresses bureaucratic concern over small-scale events that have, in the past, promoted positive interaction between commercial and recreational fishermen, thus potentially reducing or eliminating community-building opportunities.

Overall, the impacts of this option are therefore expected to be *low negative* for all vessels that may be affected, with respect to the no action option.

6.1.3 Impacts of Trip Notification Requirements (Section 3.1.4)

The Council considered options to modify/extend pre-trip and pre-landing notification requirements to all limited access herring vessels in Amendment 5 and is proposing to modify/extend both requirements.

Options Under Consideration:

- Option 1: No Action (Status Quo)
- Option 2: Modify and Extend the Pre-Trip Notification Requirements – extend pre-trip notification system and add a gear declaration to pre-trip VMS notifications (Section 3.1.4.2) ***(Preferred Alternative)***
- Option 3: Extend Pre-Landing Notification Requirement (Section 3.1.4.3) ***(Preferred Alternative)***

The Council's rationale for the ***Preferred Alternatives*** is discussed in Section 3.1.4.2 and Section 3.1.4.3 as well.

6.1.3.1 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

The Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The Atlantic herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to the proposed trip notification requirements would not be expected to affect the status of the herring resource. Some of the indirect (minor) benefits from the proposed requirements would not be realized under the no action option, as discussed below.

Both Options 2 and 3 ***(Preferred Alternatives)***, which propose trip notification requirements for limited access herring vessels in Amendment 5, should not affect removals from the fishery, so no direct impacts on the herring resource are expected. While there are no direct impacts on the herring resource anticipated by the trip notification requirements under consideration, the measures are being considered as part of a larger catch monitoring program for the Atlantic herring fishery. If catch statistics improve, management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty. This will lead to more effective long-term management of the resource. More specifically:

- Modifying and extending the pre-trip notification requirements to all limited access herring vessels through the PTNS and VMS declarations (Option 2) would help to ensure timely deployment of observers to the limited access vessels in the fishery and would facilitate enforcement;

- Extending the pre-landing notification requirements to all limited access herring vessels (Option 3) would facilitate both enforcement and portside sampling of the fishery (State, Federal, or other).

Thus, relative to the no action option, if the ***Preferred Alternatives*** are implemented in Amendment 5, data collected via the observer program, a portside sampling program, or any sampling program for the fishery may be more likely to achieve management goals (e.g., CV targets on discard estimates). Subsequently, management uncertainty may be reduced (uncertainty about discard estimates is a component of management uncertainty) and long-term management of the herring resource may improve. Overall, therefore, there is likely to be a *low positive* impact of the ***Preferred Alternatives***.

6.1.3.2 Impacts on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment). Because the no action option for trip notification requirements maintains the status quo, selection of the no action option would not be expected to result in any additional impacts on non-target species and other fisheries.

Extending the pre-trip and pre-landing notification requirements ***(Preferred Alternatives)*** may improve allocation of observers and help ensure the timely sampling of the limited access Atlantic herring fishery. Modifying and extending the pre-trip notification requirements to all limited access herring vessels through the PTNS and VMS declarations (Option 2) is intended to help ensure timely deployment of observers to the limited access vessels in the fishery and facilitate enforcement. Extending the pre-landing notification requirements to all limited access herring vessels (Option 3) is intended to facilitate both enforcement and portside sampling of the fishery (State, Federal, or other). Thus, under the options for trip notification requirements, particularly Option 2, data collected via the observer program may be more likely to achieve management goals (e.g., CV targets on catch estimates of non-target species).

Any improvements in data resulting from the trip notification options would relate only to catch in the limited access herring fishery, which represents a very small component of data utilized to formally assess the status of non-target species; these improvements would likely not impact the outcome of future stock assessments for non-target species. In comparison to the no action option, therefore, the impacts on non-target species are expected to be *neutral*. Consequently, there is no measureable difference expected between the no action option and the ***Preferred Alternatives*** relative to non-target species and other fisheries.

6.1.3.3 Impacts on Physical Environment and EFH

The trip notification measures proposed in this section are intended to improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery, but they would not influence the amount or location of herring fishing effort. Thus, they are not likely to have any adverse effects on EFH, in comparison to the no action option.

6.1.3.4 Impacts on Protected Resources

From the standpoint of protection and monitoring of protected resources in the area, the change in pre-trip notifications (Options 2 and 3, the ***Preferred Alternatives***) are administrative in nature; therefore they are not likely to have any effect on protected resources. While monitoring of the herring resource may improve slightly, the same magnitude of improvements would not likely result for protected resources. Thus, as the no action option (Option 1) would maintain status quo, and because the impacts of the measures are likely to be neutral, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area.

6.1.3.5 Impacts on Fishery-Related Businesses and Communities

Option 1 (No Action): This option maintains the status quo and does not impose any additional reporting or notification requirements on participants in the fishery. There are therefore no additional impacts on fishery-related businesses and communities expected under the no action option. However, under the no action option, any impacts on fishery-related businesses and communities (low positive, discussed below) from the options under consideration would not be realized.

Options 2 and 3 *(Preferred Alternatives)*: The intent of the trip notification requirements is to incorporate all of the Atlantic herring fishery into the notification system to (1) better inform the NEFOP of when/where herring fishing activity may occur and assist in the effective deployment of observers and (2) notify enforcement of when vessels may land and assist in the deployment of dockside monitors or samplers (if appropriate and/or necessary). While Category C vessels may not target herring as much or as often, many of these vessels also participate in the Atlantic mackerel fishery, and the measures proposed in this amendment should improve consistency with mackerel regulations as well. Category D vessels would not be subject to this requirement unless they obtain the proposed open access permit for limited access mackerel vessels fishing in Areas 2/3 (Section 3.1.6), in which case they would be treated like a Category C vessel for the purposes of notification and reporting requirements. While there are no significant impacts on fishery-related businesses and communities expected by these options, the impacts are expected to be a low positive over the long-term, relative to taking no action (for reasons discussed below). Both Options 2 and 3 are likely to be similar enough in overall benefit that when compared to each other, neither will have a larger impact than the other.

Extending the pre-trip and pre-landing notification requirements may improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery. Thus, data collected via the observer program may be more likely to achieve management goals (e.g., CV targets on discard estimates). Subsequently, management uncertainty may be reduced (uncertainty about discard estimates is a component of management uncertainty) and long-term management of the herring fishery may improve. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term. To the extent that management uncertainty can be reduced, additional yield can be made available to the fishery. The long-term impacts of reducing management uncertainty are positive for fishery-related businesses and communities.

Option 2 *(Preferred Alternative)*: Relative to the no action option, the impacts of this option on fishery-related businesses and communities are expected to be minor. The current requirement is for all vessels issued a Category A (All Areas Limited Access) or Category B (Areas 2/3 Limited Access) Permit fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished, as well as Categories C and D (Limited Access Incidental Catch and Open Access) vessels fishing with midwater

trawl gear in Areas 1A, 1B, or 3 to notify the observer program at least 72 hours in advance of starting any trip. In 2011, it was estimated that 42 out of 97 limited access vessels are already required to notify the observer program. This option would require the other 55 limited access vessels (Category C vessels) to notify the observer program through the Pre-Trip Notification System prior to starting a trip. While this option isn't likely to cost the vessel anything other than time, it may be an inconvenience as a vessel will have to wait for either an observer or a waiver from the observer program before starting a trip. Because vessels would be required to use the pre-trip notification system (PTNS) prior to any trip where the operator may harvest, possess, or land Atlantic herring, the number of notifications will increase. The pecuniary economic impacts on the herring fishery are expected to be minimal and on the order of additional 1-2 telephone calls per trip. Any economic impacts to the herring fishery will be through increased administrative and regulatory burden.

Option 2 simplifies pre-trip notification requirements for many vessels. This could increase the vessels' flexibility since they will not restrict their notification only to trips where they have planned to target herring and since all limited access vessels will be required to use the PTNS. The potential negative impact of this requirement is that observers may be assigned to vessels that do not end up catching or possessing herring, thus changing the percentage of observed trips in the directed herring fishery and reducing the effectiveness of observer allocations/deployments. There could be negative impacts on fishery-related businesses and communities depending on how observer coverage is funded and what the impacts of the funding options are (see Section 3.2.1). However, the proposed requirements for details to be provided through the PTNS (Section 3.1.4.2) should help to reduce negative impacts because the additional information should facilitate the deployment of observers on vessels that are targeting herring. Adding a pre-trip VMS gear declaration for all limited access vessels is helpful to ensure compliance and facilitate enforcement of gear-based management measures (midwater trawl access to groundfish closed areas, for example). Adding a gear designation to the pre-trip VMS declaration is not likely to impact fishery-related businesses or communities.

Option 3 ***(Preferred Alternative)*****:** This notification requirement removes ambiguity and makes the pre-landing notification a routine matter. It is unlikely to have negative impacts on herring-related businesses or communities. The current requirement is for all vessels issued a Category A (All Areas Limited Access) or Category B (Areas 2/3 Limited Access)Permit fishing on a declared herring trip with midwater trawl or purse seine gear regardless of area fished, as well as Categories C and D (Limited Access Incidental Catch and Open Access) vessels fishing with midwater trawl gear in Areas 1A, 1B, or 3 to notify the National Marine Fisheries Service Office of Law Enforcement (via VMS) of the time and place of offloading at least 6 hours prior to crossing the VMS demarcation line on your return trip to port, or, for vessels that have not fished seaward of the VMS demarcation line, at least 6 hours prior to landing.

In 2011, it was estimated that 42 out of 97 limited access vessels are already required to send in a pre-landing notification using their VMS units. This option would require the other 55 limited access vessels (Category C vessels) to fill out the pre-landing notification form on their VMS units when on a declared herring trip. Each pre-landing notification form costs a minimum of $0.60 per submission. On average, limited access herring vessels are estimated to take 24 trips per vessel per year. Therefore, the increase in cost would be at a minimum $15 annually for each vessel. It takes approximately two minutes to submit the pre-landing notification, which would cost each vessel approximately 48 min. annually. Considering the low costs of this option compared to the benefit for enforcement purposes, Option 3 would likely have a low positive impact compared to the no action option.

6.1.4 Impacts of Reporting Requirements for Federally Permitted Dealers (Section 3.1.5)

Options Under Consideration:

- Option 1: No Action (Status Quo)
- Option 2: Require Federally Permitted Herring Dealers to Accurately Weigh All Fish (Section 3.1.5) ***(Preferred Alternative)***
    - *Option 2A:* require dealers to annually document how the composition of a mixed catch may be estimated
    - *Option 2B:* require dealers to document how the composition of a mixed catch may be estimated for every landings submission ***(Preferred Alternative)***
    - *Option 2C:* require dealers to obtain vessel representative confirmation of SAFIS transaction record at first point of sale

6.1.4.1 Background – General Analysis of Impacts

The impacts of the dealer reporting requirements under consideration in Amendment 5 are addressed below in a general sense and then subsequently addressed briefly relative to each VEC identified in the Amendment 5 Affected Environment (Section 5.0).

Option 1 is the no action alternative and represents the status quo. Currently dealers are required to report the weight of fish purchased to NMFS. The methods dealers use to determine the weight of fish purchased vary and can include weighing fish on scales and/or using volumetrics to determine the weight of fish.

In 2007, there were 230 federally-permitted Atlantic herring dealers, and by 2010 there were 273 dealers, all of which have the potential to be affected by Option 2 ***(Preferred Alternative)***. Federally-permitted dealers, however, become Atlantic herring dealers by selecting the species on their permit application form, which is an option that presents no extra cost. Of the 273 Atlantic herring dealers in 2010, only 92 purchased herring. Those that were not registered may or may not choose to register as herring dealers in the next application process, depending on the perceived impact that may result from the requirements implemented through this option. It is not clear if all federally permitted dealers would be held to the proposed requirements, or if only the registered herring dealers would be impacted. The analysis of impacts is further complicated by federally permitted dealers that are not currently registered as *herring* dealers, but who purchased herring in the last three years. The measures proposed in this amendment are intended to clarify reporting requirements for dealers and reduce the occurrence of this in the future.

The spatial extent of the impacts resulting from this measure is also difficult to determine. The location of Federally-permitted dealers that purchased herring ranges from North Carolina to Maine, but the highest impacted States may be Maine and Massachusetts, as they are the States with the highest number of dealers who purchased herring and have the highest revenue generated by their dealers. Dealers registered in Maine and Massachusetts, however, purchased 77% and 90% of their herring from the States in which they were registered in 2010, so other states such as Rhode Island may also be affected.

In addition to the range of dealers to which the proposed requirements may apply, there are also numerous ways in which federally permitted Atlantic herring dealers may comply with the proposed management action (Option 2, ***Preferred Alternative***). Therefore, for the purposes of this analysis, **four examples** have been created to evaluate the possible responses of the federally permitted herring dealers to Option 2, which range in the austerity of the reaction.

Example 1 and Example 2 are meant to illustrate the potential impacts of the proposed requirement if federally permitted herring dealers chose to utilize scales to comply with the action. Example 1 describes the impacts of hopper scales, and Example 2 describes the impacts of truck scale utilization in the fishery.

Appendix I in Volume II (*Discussion Paper: Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery*) provides a full description of hopper scales and truck scales, as well as the potential costs, benefits, and potential downfall of the various scales that could be used. These examples characterize a potentially higher change in the fishery as a result of the measure, in comparison to the first example. The cost of scales can vary dramatically, however. The use of an already existing truck scale can cost as little as $10, but the distance to reach it may be great (two ports had scales more than an hour away and another four ports did not have reachable scales). Installation of a truck scale in an easily-accessible port can cost more than $100,000, depending on the area in which the scale will be placed. Not all dealers may use trucks in the transport of fish, however, and water weight can add to the total truck weight significantly, depending on where the scale is located. Hopper scales can have multiple or single hoppers, and weigh fish as they flow through the scale. For precise estimates the water needs to be completely separated from the fish before use. Hopper scale costs can range from $20,000 to $50,000 per scale, and newer models are now being produced that can be used on vessels at sea. Dealers would need to decide on a location or locations for both types of scales, and in the case of hopper scales, some may decide to require that vessels carry the hopper scales to avoid the cost.

If either Sub-Options 2A or 2B are chosen in conjunction with this measure (Sub-Option 2B represents the ***Preferred Alternative***), then dealers may choose to create a method for separation of catch before the fish were weighed. Alternatively, any range of methods for determining catch composition could be used post weighing (i.e. visual, sub sampling, etc.) as the Sub-Options require no specific form of composition estimate, just a recording of the methods utilized (yearly or on by landing submission). Depending on the method used, the additional effort that will be required could range from significant or barely adding to the processing time. The resulting percentage from the method used could be used in conjunction with the overall weight to determine the weights of each species. Sub-Option 2C would not require any additional weighing or estimation work in this scenario, but would require additional administrative work for vessel owners or operators after the catch has been weighed.

Example 3 would entail dealers complying with the action by utilizing volumetric estimation to determine the weight of all fish. Volumetric estimation could be conducted in a number of ways, one of which is already applied in the state of Maine and is described in Appendix I in Volume II (*Discussion Paper: Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery*). The State of Maine requires that all vessels have their holds measured by the State Department of Weights and Measures to volumetrically certify the amount of fish that the vessel can contain. Once that process has been completed, dealers could employ a weight on a string, which would be lowered into the hold to determine the level of the fish, and therefore the estimated volume, which in turn could be converted into an approximate weight.

Another way to volumetrically estimate the weight of all fish would be to fill a bait container that is utilized in the process of transporting herring on land with herring and weigh the container. The estimated weight, based on the volume of fish contained therein, could be expanded to serve as the weight of any box of fish of a similar size. Similarly, the makers of the bait container could supply this information. If the state of Maine example is followed, then the cost could range from $350 for a 100 hogshead vessel to $600 dollars if a Marine Surveyor completed a similar task. If a manufacturer provides the dealer with the average weight of a fish container, or if one dealer weighs a widely-used bait container on an existing scale and distributes the estimation of weight, there would be no additional costs associated with Example 3. This example characterizes the lowest overall impact as very little, if any, as the change in the behavior of federally permitted dealers and vessels would be less in comparison to the following examples. The efficacy of this example, however, may be compromised by the varying weight of fish through the fishing season, if the same conversion from volume to weight is used. The estimates may therefore not be an improvement over Option 1 (status quo).

In this example, if either Sub-Options 2A or 2B are chosen in conjunction with this measure (2B represents the ***Preferred Alternative***), then dealers could create a method for estimation of the composition of catch that could occur before or after the volumetric estimate was conducted; either way the estimation could be calculated from the estimate of percentages of bycatch and the volumetric estimate. Similar to Examples 1 and 2, any range of methods for determining catch composition could be used (i.e. visual, sub sampling, etc.) as the Sub-Options require no specific form of composition estimate, just a recording of the methods utilized (either yearly or on by landing submission). Depending on the method used, the additional effort that will be required could range from significant or barely adding to the processing time. Sub-Option 2C would not require any additional estimation work in this scenario, but would require additional administrative work for vessel owners or operators after the catch had been estimated.

Example 4 is one that may occur in tandem with the prior three examples, as it illustrates the potential change in behavior surrounding herring processor plants. Processing plants have two mechanisms for processing herring: running the herring through a dewatering box and selling it as bait, and bringing the herring into the facility for processing. The discussion paper in Appendix I, Volume II of this document provides a full description of a processing plant and the process that herring follow. If the herring are being sold as bait, then they are subject to the same process that herring experience in most other ports, and Examples 1 through 3 would be applicable ways for processors to comply with the measure, and this would be the same with the Sub-Options. If herring are brought into the facility for processing, however, a few changes may need to be made. Currently, landed bycatch is sorted out and discarded in two phases of the herring processing, and the bycatch is discarded while the herring are weighed accurately for packaging purposes. To comply with the requirements proposed in Sub-Option 2A and 2B (2B represents the ***Preferred Alternative***), processors may decide to utilize the same scales used to weigh the herring, or they may choose a method similar to those presented in Examples 1 through 3. The cost of the extra time and effort are therefore difficult to quantify, and while utilizing the same scales used to weigh the herring would cut costs, there would be added time and effort by employees. Additional administrative work for vessel owners or operators would also be required under Sub-Option 2C, as the SAFIS reports would need to be confirmed or potentially contradicted.

Table 128 Summary of Examples Used to Characterize Impacts of Dealer Reporting Options

Example	*1: Truck Scales*	*2: Hopper Scale*	*3: Volumetric Estimation*	*4: Processors*
Potential Requirements	Ranges from finding an already existing truck scale close to the port to having permanent space in a port for a scale	May need space on individual vessels or on land for the scale to be located; may need additional time for scale to weigh all fish	May need a service to volumetrically certify vessel or a scale to estimate average bait container weight	May need more space and time for sorting
Potential Cost	$10 to $100,000 or more per scale or port	$20,000 to $50,000 or more per scale, port, or vessel	$0 - $600 or more per vessel	Unknown
Potential Efficacy	Some scales less effective than others; water weight varies; not all fish are transported via trucks	Precise so long as water is removed completely	May be reduced by the variation in herring weights over the season/not dissimilar to Option 1 (status quo)	Herring accurately weighed; bycatch could be weighed similarly or using a similar method to Examples 1-3

6.1.4.2 Impacts on Atlantic Herring

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to dealer reporting requirements would not be expected to affect the status of the herring resource. Some of the indirect benefits from the proposed dealer reporting requirements would not be realized under the no action option, but, as discussed below, the measures under consideration are expected to have low positive impacts on the Atlantic herring resource.

As Option 2 ***(Preferred Alternative)*** does not require dealers to use any particular method to accurately weigh all fish, dealers are unlikely to change their behavior under Option 2, in comparison to the no action option. Option 2 has the potential to improve the calculation of catch statistics and quantification of landed bycatch if used in concert with a port-side sampling program to determine catch composition, however. Since no such portside program is currently under consideration, this option will likely not have any effect on the herring resource. Overall, therefore, Option 2 is likely to have a neutral impact in comparison to Option 1.

The addition of Sub-Options 2A and 2B (2B represents the ***Preferred Alternative***) may not impact the reporting to any large extent as they provide only a slight improvement in reporting over Option 1. As was explained above, there is no requirement to estimate the relative composition of the catch in a specific way, there is only a requirement to document it in Sub-Options 2A and 2B. It is therefore dependent on the dealer to determine what method they will use. The newly documented information is not likely to be used in a stock assessment but may improve understanding of the harvesting of the resource and therefore the impact would likely be a low positive.

This low positive impact may also result from Sub-Option 2C. Sub-Option 2C is designed to identify erroneous data discrepancies between dealer and vessels reports. The measure would require vessel owners/operators to review and validate all catch information reported for their vessels in Fish-on-Line (FOL) on a weekly basis, including VMS, VTR, and dealer data. If data issues are noted by the vessel owner/operator they would indicate a data issue and provide comments describing the issue, this would create an issue report to NMFS in FOL. NMFS would follow up on all issue reports to resolve discrepancies by working with vessel operators and dealers to correct data submissions. The exact methodology is still being developed, but whether or not a vessel's owner/operator indicated data issues could be made available to dealer as vessel confirmation of the dealer report.

In the 2012 Herring ACL Proposed Rule (76 FR 79610, December 22, 2011), NMFS described issues with reporting errors. As NMFS was reviewing the 2010 herring data, and comparing individual VTRs with individual dealer reports, it resolved data errors resulting from misreporting. Common dealer reporting issues were: Missing dealer reports; incorrect or missing VTR serial numbers; incorrect or missing vessel permit numbers; and incorrect dates. VTRs had similar errors. Common VTR reporting issues were: Missing VTRs; missing or incorrect dealer information; incorrect amounts of landed herring; incorrect dates; and missing or incorrect statistical area. Because the quality of herring landings data is affected by unresolved data errors; in the proposed rule, NMFS encouraged vessel owner/operators and dealers to double check reports for accuracy and ensure reports are submitted on a timely basis.

For in-season monitoring, NMFS uses vessel reports supplemented by dealer reports (when vessels reports are missing or in error). Sub-Option 2C would provide a tool to help identify and resolve erroneous data discrepancies between vessel and dealer reports. Having discrepancies between these data sets resolved quickly would likely improve the quality of data used by NMFS to monitor landings against management area sub-ACLs and may help reduce the likelihood that the FMP's overage payback AM would be triggered. For year-end catch determinations, NMFS uses dealer reports supplemented by VTRs. Again, having discrepancies between these data sets resolved quickly would likely help the year-end data reconciliation process.

While all three sub-options have differing requirements for reporting, the overall impact to the herring resource is likely to be minimal, as none substantially change the way information on the resource is gathered. Overall, all three sub-options may create a *low positive* impact on the Atlantic herring resource in comparison to Option 1.

6.1.4.3 Impacts on Non-Target Species and Other Fisheries

Option 2 ***(Preferred Alternative)*** may have a similar impact on groundfish, mackerel, and river herring to that of Atlantic herring. Option 2 does not require dealers to use any particular method to accurately weigh all fish, and therefore dealers are unlikely to change their behavior under Option 2, in comparison to the no action option. Overall, therefore, Option 2 is likely to have a neutral impact in comparison to Option 1.

Sub-Options 2A and 2B (2B represents the ***Preferred Alternative***) would require the method of the separation of species to be reported either annually or for every landings submission. There is no requirement to estimate the relative composition of the catch in a specific way, there is only a requirement to document it in Sub-Options 2A and 2B. It is therefore dependent on the dealer to determine what method they will use. The newly documented information is not likely to be used in a stock assessment but may improve understanding of catch of groundfish, mackerel, river herring, or other non-target species in the herring fishery. The impact of Sub-Options 2A and 2B is therefore expected to be a low positive. This low positive impact may also result from Sub-Option 2C, for the same reporting requirement improvements. While all three sub-options have differing requirements for reporting, the overall impact to the herring resource is likely to remain the same, as none are likely to improve the gathered information on the resource substantially. Overall, all three sub-options may create a low positive impact on the Atlantic herring resource in comparison to the Option 1.

6.1.4.4 Impacts on Physical Environment and EFH

The reporting measures in this section would require dealers to either accurately weigh all fish by species, or to specify how such values are estimated if the catch is not separated. None of the measures proposed in this section are likely to have any adverse effects on EFH, in comparison to the no action option.

6.1.4.5 Impacts on Protected Resources

If Option 2 ***(Preferred Alternative)*** is implemented, the new requirement for herring dealers to "accurately weigh all fish" is not likely to affect protected resources. Although monitoring of the fishery will increase in all of the sub-options under consideration (Sub-Options 2A – 2C), the catch composition estimation will likely be performed once vessels have landed their catch and after they have had a chance to sort out any protected resources that may have been incidentally captured. The no action option (Option 1) would likely maintain status quo, and because the impacts of the measures are likely to be neutral, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area.

6.1.4.6 Impacts on Fishery-Related Businesses and Communities

The no action option maintains status quo conditions for dealer reporting requirements and would not impose any additional requirements or restrictions on herring dealers. There are therefore no additional impacts on fishery-related businesses and communities expected from the no action option.

Option 2 ***(Preferred Alternative)*** does not require dealers to use any particular method to accurately weigh all fish, and therefore dealers are unlikely to change their behavior under Option 2, in comparison to the no action alternative. Therefore, Option 2 is likely to have a neutral impact in comparison to Option 1.

Sub-Options 2A, 2B, and 2C (2B represents the ***Preferred Alternative***) would likely have a low negative impact as a result of the extra time and effort involved in filling out more reports, particularly for Sub-Option 2C, which would require vessel representative confirmation of dealer reports. Sub-Option 2C may be the most burdensome compared to the other sub-options, as if records were to be disputed by the vessel owner/operator, then the time and effort involved with correcting these numbers with NMFS could be larger, depending on the composition of the dispute. For example, a missing "0" in a dealer may be easily disputed and corrected among the three parties (dealer, vessel owner/operator, and NMFS) but if the numbers were disputed for other reasons, such as the dealer wanting to pay less money for the quantity of fish purchased, then the debate could be lengthy. These requirements may also foster negative attitudes toward management, particularly with Sub-Option 2C, by increasing the reporting burden felt by dealers and vessel owners.

Conversely, if erroneous data discrepancies between the vessel and dealer reports resulted in a management area to be closed to directed fishing prematurely, there would be a potential loss in revenue associated with those data errors. If data discrepancies resulted in a management area being closed to directed fishing too late, and the management area sub-ACL was exceeded, there would a potential future loss in revenue associated with the FMP's overage payback provision. Sub-Option 2C would provide a tool to help identify and resolve erroneous data discrepancies between vessel and dealer reports. Having discrepancies between these data sets resolved quickly would likely improve the quality of data used to monitor against area sub-ACLs and could be an economic benefit to industry participants.

Overall, relative to no action, Sub-Options 2A and 2B (2B represents the ***Preferred Alternative***) may have a low negative impact on industry participants due to the regulatory burden of documenting how catch composition is estimated while Sub-Option 2C may have a low positive impact on industry participants, despite an increased regulatory burden, if it helps minimize any loss of revenue due to erroneous data discrepancies in the vessel and dealer reports used to track herring landings against management area sub-ACLs.

6.1.4.7 Summary of Impacts (Sub-Options)

A summary of the potential impact of the proposed sub options for dealers under the requirement to weigh all fish, relative to the VECs identified in Amendment 5, is presented in Table 129.

Table 129 Summary of Impacts of Dealer Reporting Sub-Options

VEC	***Sub-Option 2A***	***Sub-Option 2B***	***Sub-Option 2C***
Atlantic Herring	Low Positive	Low Positive	Low Positive
Non-Target Species and Other Fisheries	Low Positive	Low Positive	Low Positive
EFH	Neutral	Neutral	Neutral
Protected Resources	Neutral	Neutral	Neutral
Fishery Related Businesses and Communities	Low Negative/ Neutral	Low Negative/ Neutral	Low Negative and Low Positive

*Sub-Option 2B represents the **Preferred Alternative**.*

6.1.5 Impacts of Changes to Open-Access Permit Provisions for Limited Access Mackerel Vessels in Areas 2/3 (Section 3.1.6)

The Council is considered two options in Amendment 5, in addition to the no action option, to increase the herring possession limit for limited access mackerel vessels fishing in Areas 2/3 that did not qualify for a limited access herring permit. The Council's ***Preferred Alternative*** is Option 2.

6.1.5.1 Background

Options Under Consideration:

- Option 1: No Action (Status Quo)
- Option 2: Increase Open Access Possession Limit to 20,000 Pounds in Areas 2/3 for Vessels that Also Possess a Federal Limited Access Mackerel Permit (Section 3.1.6.2) ***(Preferred Alternative)***
- Option 3: Increase Open Access Possession Limit to 10,000 Pounds in Areas 2/3 for Vessels that Also Possess a Federal Limited Access Mackerel Permit (Section 3.1.6.3)

The limited access program for the Atlantic mackerel fishery is based on a multi-tiered approach to a limited access permit structure, with each tier specifying different criteria for limited access qualification. Proposed qualification for different limited access mackerel permits was proposed, in part, to address the overlap between the herring and mackerel fisheries and minimize problems that may result if herring vessels do not receive limited access permits for mackerel. The potentially-impacted vessels are identified are discussed below.

The overlap between the Atlantic herring and mackerel fisheries is universally recognized as an important fishery management issue that the Council has always intended to accommodate in the most appropriate manner. If the Category D vessels have not been targeting mackerel or taking trips where they may encounter a mix of herring and mackerel (and/or other species) more recently (for a variety of reasons), VTR records may not reflect a bycatch problem at this time and may not fully characterize the potential for this problem to exist in the future. The industry has stated that these vessels have not been fishing for mackerel as much in recent years because (1) they are smaller vessels, and the mackerel fishery shifted into offshore areas; and (2) concerns about encountering herring in quantities larger than 3 mt on "mixed" trips and consequently being in violation of the herring possession limit have influenced their decisions about taking these trips at all.

The Council created the open access possession limit permit to minimize the potential for directed herring fisheries to develop while still providing controlled opportunities for vessels in other fisheries to catch small amounts of herring and minimize their bycatch. Decisions regarding increased opportunities in these areas should be made with adequate consideration of overall fleet capacity and the long-term effects of over-capacity. Moreover, if additional opportunities for directed fishing in Areas 2/3 result from an increase in the open access possession limit, new vessels could create fishing history in these areas. This is a very important consideration if quota allocation programs are going to be developed for the herring fishery. Increasing the open access possession limit to a level that allows for directed fishing and the establishment of any substantial amount of fishing history could increase the number of participants to be considered in a sector allocation or individual quota allocation program, should the Council choose to develop one in the future.

During the development of the options under consideration in Amendment 5, the Herring PDT analyzed available data to determine the current extent of herring bycatch (discards) by limited access mackerel vessels. The PDT offered the following comments and recommendations regarding the development of management options to address this issue in Amendment 5:

- Available fishery data do not indicate that the current 3 mt possession limit of herring for open access permit holders is problematic at this time (see below); it does not appear to be resulting in bycatch/regulatory discards for vessels fishing in any of the management areas and reporting their herring landings and discards through the logbooks.

Additional information and analyses were provided to the Herring Committee and the Council by the Herring PDT during the development of the options under consideration in this amendment; this information can be found in previous Amendment 5 Discussion Documents (2009 and 2010). The PDT offered the following additional comments:

- The overlap between the Atlantic herring and mackerel fisheries is universally recognized as an important fishery management issue that the Council has always intended to accommodate in the most appropriate manner. If the Category D vessels have not been targeting mackerel or taking trips where they may encounter a mix of herring and mackerel (and/or other species) more recently (for a variety of reasons), VTR records may not reflect a bycatch problem at this time and may not fully characterize the potential for this problem to exist in the future. The industry has stated that these vessels have not been fishing for mackerel as much in recent years because (1) they are smaller vessels, and the mackerel fishery shifted into offshore areas; and (2) concerns about encountering herring in quantities larger than 3 mt on "mixed" trips and consequently being in violation of the herring possession limit have influenced their decisions about taking these trips at all.
- Although the sub-ACLs are not fully utilized in Areas 2 and 3 at this time, the Council created the open access possession limit permit in Amendment 1 to minimize the potential for directed herring fisheries to develop while still providing controlled opportunities for vessels in other fisheries to catch small amounts of herring and minimize their bycatch. Decisions regarding increased opportunities in these areas should be made with adequate consideration of overall fleet capacity and the long-term effects of over-capacity.
- Moreover, if additional opportunities for directed fishing in Areas 2/3 result from an increase in the open access possession limit, new vessels could create fishing history in these areas. This is a very important consideration if quota allocation programs are going to be developed for the herring fishery. Increasing the open access possession limit to a level that allows for directed fishing and the establishment of any substantial amount of fishing history could increase the number of participants to be considered in a sector allocation or individual quota allocation program, should the Council choose to develop one in the future.

6.1.5.2 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The Atlantic herring resource is not overfished, and overfishing is not occurring. ACLs and sub-ACLs are set and monitored based on total catch, including both landings and discards. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to the proposed changes to open-access permit provisions for limited access mackerel vessels would not be expected to affect the status of the herring resource. No additional impacts on the herring resource are expected if the no action option is selected.

Relative to the Option 1 (no action), the impacts of the two options under consideration to increase the open access possession limit for limited access mackerel vessels in Areas 2/3 on the Atlantic herring resource should be *neutral* because the fishery will continue to be managed through ACLs and sub-ACLs, which include both landings and discards. The potential impact on individual stock components is more difficult to predict, as the stock components are not assessed individually at this time, and the impact will depend on the timing of the fishery and stock component mixing, which remains uncertain. By increasing the open access possession limit for some mackerel vessels fishing in Areas 2/3, the proposed options may increase the amount of herring harvested in these areas since the sub-ACLs in Areas 2/3 are not fully utilized at this time. Consequently, the sub-ACLs in these areas may be more readily achieved under the options being considered. Because of the general high-volume nature of the herring fishery, the difference between increased herring harvest under Option 2 (20,000 pounds, ***Preferred Alternative***) and Option 3 (10,000 pounds) is likely insignificant. Ultimately, all removals are controlled by the sub-ACLs in the management areas, therefore resulting in a neutral impact on the herring resource under the no action option.

The options under consideration are intended to minimize the potential for regulatory discarding of Atlantic herring by limited access mackerel vessels that did not qualify for a limited access herring permit. Preliminary analyses of data during the development of Amendment 5 suggested that herring discards in the mackerel fishery are currently low (see previous discussion in background, Section 6.1.5.1), so the extent to which they may be minimized under the proposed options is unclear, and the differences between the impacts of the two options are not measurable at this time. The Herring PDT may update this analysis and explore this issue further in the Final EIS for Amendment 5, following implementation of the limited access program for the mackerel fishery. Again, however, assuming discards continue to be monitored/reported, all catch – landings and discards – is managed under the ACLs and sub-ACLs for the Atlantic herring fishery, so the impacts of the options on the Atlantic herring resource should be *neutral*.

6.1.5.3 Impacts on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment). Because the no action option maintains the status quo, there are no additional impacts expected on non-target species and other fisheries. Any regulatory discarding of herring that occurs on limited access mackerel vessels with open access herring permits may continue to occur, and any negative impacts of that activity may continue to be experienced by the affected vessels in the mackerel fishery.

Relative to taking no action (Option 1), Option 2 ***(Preferred Alternative***) and Option 3 create a potential for increased fishing activity and perhaps increased directed fishing for herring in Areas 2/3, most likely during times when river herring bycatch is of greater concern. While the herring fishery is managed by sub-ACLs that limit the overall harvest in each management area, the sub-ACLs are not always fully utilized in Areas 2 and 3 (although more so in current/recent years), so there may be potential for effort in these areas to increase beyond recent levels. Because of uncertainty associated with variability in the distribution of non-target species and seasonality/effort shifts in the Atlantic herring fishery, the impacts of Options 2 and 3 on non-target species and other fisheries are *unknown*.

The impacts of Options 2 and 3 on non-target species and other fisheries will depend, in part, on how many vessels would obtain the new permit, as well as whether or not additional measures are implemented to monitor or manage the catch of non-target species in the times and areas where vessels with the new mackerel permit may fish. Section 6.1.5.6 (Impacts on Fishery-Related Businesses and Communities) provides some perspective on the number of vessels in the mackerel fishery that may be affected by Options 2 and 3 and has been updated by the Herring PDT for this analysis. However, the impacts of the options on non-target species relate *more* to where/when fishing effort is applied and *less* to the number of affected vessels; therefore, the specific impacts remain *unknown*.

6.1.5.4 Impacts on Physical Environment and EFH

The permit-related measures in this section would create a new open-access herring permit type for use by limited access mackerel fishery participants operating in Areas 2 and 3, with a higher possession limit of 20,000 lb (Option 2, ***Preferred Alternative***) or 10,000 lb (Option 3).

Herring PDT examinations of available data do not indicate that the current 3 mt (6,614 lb) possession limit is a problem for mackerel vessels (i.e. there do not appear to be large amounts of regulatory discards), but there is an indication from industry members that this lower possession limit influences fishing behavior (specifically, that these vessels avoid fishing in areas where herring and mackerel co-occur in southern New England). Thus, implementation of either Option 2 or Option 3 could result in a change in the amount or location of fishing effort in the mackerel fishery. However, as noted in the Impacts on Fishery-Related Businesses and Communities section, less than 2% of mackerel landings during 2008-2010 were by vessels that had a Category D herring permit, i.e., vessels that were subject to the 3 mt possession limit for Atlantic herring. Although many mackerel vessels have a Category D herring permit, most of these are in tier 3 of the proposed mackerel limited access permit scheme, and the landings for all tier 3 vessels are capped at 7% of the overall mackerel quota. Thus, while the increased possession limit would potentially apply to many vessels, the effort and landings of these vessels are likely to be limited, and any increase in bottom contact resulting from the ***Preferred Alternative*** would have no more than a minimal adverse impact on benthic EFH when compared to Option 1 (no action).

6.1.5.5 Impacts on Protected Resources

In comparison to the No Action Option (Option 1), both options may potentially increase the impact to protected resources. Option 2 ***(Preferred Alternative)*** and Option 3 may have the potential to increase incidental bycatch or encounters with some protected resources by the mackerel fishery, such as harbor, hooded and harp seals, due to the increase in effort. While the herring fishery is managed by sub-ACLs that limit the overall harvest in each management area, the sub-ACLs are not yet fully utilized, so there is potential for effort in these areas to increase beyond recent or current levels. Although not directly correlated, the greater the fishing effort, the more interactions with protected species may occur. Option 3 would likely have a slightly larger chance of encounter with protected resources than Option 2. As was stated above, however, the current possession limit of herring for open access permit holders is 3 mt, which is not problematic at this time. The magnitude of the increase in trips that would be taken would not likely be large, however, as it is Category D vessels that have not been taking trips where they may encounter a mix of herring and mackerel that may begin to do so. Furthermore, the measures are not likely to shift effort to areas outside the typical operating fishing grounds of the mackerel and herring fisheries, thereby not increasing the chance that a more diverse range of protected resources. Therefore, the overall impact to protected resources is *neutral*.

6.1.5.6 Impacts on Fishery-Related Businesses and Communities

This measure is being considered specifically for Category D vessels that may possess a limited access mackerel permit. Category A/B/C vessels should not be directly affected by these options. If Category D vessels qualify for and obtain the new permit proposed in this section (any option), they would be treated like a Category C vessel for the purposes of notification and reporting requirements. This means that they would be subject to trip notification requirements and additional reporting requirements for limited access herring vessels that may be implemented in Amendment 5. Overall, the impacts of these options on the affected vessels are expected to be positive in comparison to the no action option, because of increased fishing opportunities and potential reductions in regulatory discards of herring.

Option 1 (No Action): In general, there are no additional impacts on fishery-related businesses and communities expected under the no action option because the current regulations that allow mackerel catch would stay in place. Available fishery data do not indicate that the current 3 mt possession limit of herring for open access permit holders is problematic at this time; it does not appear to be resulting in bycatch/regulatory discards for vessels fishing in any of the management areas and reporting their herring landings and discards through the logbooks (see Section 5.5.1). However, if the mackerel fishery grows, the regulatory discard of herring as a result of the open access possession limit may also increase for some vessels, a situation that could negatively impact herring-related businesses and communities. In this case, under the no action option, the positive impacts of either Option 2 or Option 3 on fishery-related businesses and communities would not be realized.

Option 2 (20,000 pounds, *Preferred Alternative*):

The impacts of the ***Preferred Alternative*** on fishery-related businesses and communities is expected to be positive in comparison to the no action option, and more positive than Option 3, as it will allow for more mackerel catch. Creation of a new permit category with a 20,000 pound possession limit could decrease the occurrence of regulatory discards and increase revenues for vessels that qualify for this permit category. From 2008-2010, approximately 98% of mackerel landings were landed by vessels which also held a Category A herring permit. Over the same time, approximately 1.1-1.4% of mackerel landings were landed by vessels which held a Category D herring permit. Therefore, the number of potentially impacted trips is likely to be small: the vast majority of mackerel are landed by vessels which already hold a Category A permit and are not subject to the 3 mt possession limit.

Table 130 describes the anticipated mackerel limited access vessels and the Atlantic herring permits which are held by these vessels (based on 2010 data) when the Herring PDT analysis was developed for the Amendment 5 DEIS. At the time of the DEIS writing, there were a total of 244 vessels with Herring Category D (open access) permits which are projected to qualify for a Limited Access mackerel permit; however most of these vessels would qualify for a Tier 3 Mackerel permit. While many vessels may qualify, these vessels account for only a small amount of herring catch.

Table 130 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits (from Amendment 5 DEIS)

		Herring Permit Category				
		A	**B**	**C**	**D**	**None**
Mackerel Tier	**1**	20	0	5	2	3
	2	0	1	5	26	12
	3	3	2	15	216	93

Note: Data are preliminary; implementation of the mackerel limited access program is pending.

Since the Amendment 5 DEIS was completed, information about mackerel limited access qualifiers has been updated by NMFS, and it appears that the number of vessels likely to obtain the proposed open access herring permit for Areas 2/3 is far less than originally predicted (see below), therefore reducing some of the potential concerns expressed by the Herring PDT.

Table 130 describes the anticipated mackerel limited access vessels and the Atlantic herring permits which are held (based on 2011 data – note that the application period for a limited access mackerel permit does not end until February 2013). The shaded cells represent the number of projected limited access mackerel vessels (by tier) that possess either a Category D (open access) herring permit or no herring permit. Currently, there are a total of 64 vessels with Herring Category D (open access) permits which are projected to qualify for a Limited Access mackerel permit; most of these vessels would qualify for a Tier 3 Mackerel permit. While many vessels may qualify, these vessels account for only a small amount of herring catch.

In recent years, about 95% of all Atlantic mackerel landed has been landed by vessels that are expected to qualify for a Tier 1 mackerel limited access permit. Based on the updated analysis of limited access qualifier, there are expected to be one Tier 1 mackerel vessel with a Category D herring permit (no expected Tier 1 mackerel vessels are without a herring permit of some kind) and 12 Tier 2 mackerel vessels with a Category D herring permit (no expected Tier 2 mackerel vessels are without a herring permit of some kind).

Table 131 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits (Updated Based on 2011 Data)

		Herring Permit Category				
		A	**B**	**C**	**D**	**None**
Mackerel Tier	**1**	18	0	4	1	0
	2	0	1	4	12	0
	3	2	1	7	51	2
	4	14	2	26	1,392	319
	None	2	0	4	316	

Note: Data are still preliminary; implementation of the mackerel limited access program is pending.

There may be impacts to current Category A permit holders through additional competition in the herring market; however, these are likely to be small given the low levels of mackerel landings by vessels which might be in the new permit category and the low proposed possession limits for herring.

Option 2 (***Preferred Alternative***) creates a form of reciprocity between limited access herring fishery participants and limited access mackerel fishery participants. Since each are likely to catch the other's targeted species as bycatch/incidental catch, the equity issue may be resolved by permitting similar levels of non-directed catch in both fisheries. The restriction to Areas 2/3, the proposed possession limit, and reporting requirements assure that the ACLs will not be breached by allowing mackerel boats increased possession limits of herring. Mackerel vessels that may qualify and choose to obtain the new open access permit for herring would have the burden of increased notifications and reporting (the requirements would be the same as those for Category C herring vessels). To the extent that the mackerel vessels' herring landings increase herring availability, prices could be depressed. On the other hand, increased herring landings at the processing plants that lack product could benefit both the plants (and their workers) and the communities. Overall, the impacts of Option 2 are expected to be positive for fishery-related businesses and communities.

Option 3 (10,000 pounds): Creation of a new permit category with a 10,000 pound possession limit could decrease the occurrence of regulatory discards and increase revenue for vessels that qualify for this permit category. Impacts of this option are likely to be similar as those discussed above under Option 2 (20,000 pounds), but slightly less catch will be allowed, and therefore the benefits may be slightly less. When compared to the no action option, however, the impacts of Option 3 are likely to be positive.

6.2 IMPACTS OF ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE ON LIMITED ACCESS HERRING VESSELS (SECTION 3.2.1)

This section addresses the potential impacts of the ***Preferred Alternative*** and other management alternatives considered by the Council in Amendment 5 to allocate observer coverage on limited access herring vessels (Categories A/B and/or C). A detailed analysis of the potential impacts of the management alternatives considered by the Council can be found in Appendix III of this document (*Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*, Volume II). The following discussion provides a comprehensive summary of the impacts of the ***Preferred Alternative*** and other alternatives (including no action) on the five VECs identified in Amendment 5.

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

6.2.1 Background

6.2.1.1 Alternatives Under Consideration

A complete description of the alternatives/options under consideration to allocate observer coverage on limited access herring vessels can be found in Section 3.2.1 of this document. A summary table is provided on p. 49.

Alternative 1: No Action

Alternative 2 *(Preferred Alternative)*: Require 100% Observer Coverage on Category A and B Herring Vessels

Alternative 3: Require SBRM Coverage Levels as Minimum Levels

Alternative 4: Allocate Observer Coverage Based on Council-Specified Targets/Priorities

Funding Options

Option 1 *(Preferred Alternative, Year 1)*: No Action

Option 2 *(Preferred Alternative)*: Federal and Industry Funds

Options for Observer Service Providers

Option 1: No Action

Option 2 *(Preferred Alternative)*: States Authorized as Service Providers

6.2.1.2 Development of Analysis

The Herring PDT began working on analyses related to the allocation of observer coverage in the Atlantic herring fishery in 2009, as the Committee and Council continued to discuss issues and develop the details of the alternatives for Amendment 5. Much of the PDT's preliminary work/analysis during 2009 and 2010 informed decision-making and the development of the details of the Amendment 5 alternatives. The complete analysis provided by the Herring PDT is contained in Appendix III, Volume II (*Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*). As discussed below, additional information and analyses can be found in Appendix II (*Herring PDT Portside Sampling/Sea Sampling Data Analysis).*

As an important step in this analysis, the Herring PDT reviewed in detail all available catch/bycatch sampling data for the Atlantic herring fishery. A preliminary analysis was conducted to examine similarities and differences between bycatch data collected by observers versus portside samplers (see Appendix IIA in Volume II). The PDT formed a working group to examine all available data from overlapping portside/sea sampling trips in detail to investigate differences between the data sets and discuss sampling methodologies. Understanding the reasons for the differences between portside and at-sea estimates will improve the overall understanding of the data and increase the usefulness of future data collected through both programs. The working group met informally between PDT meetings during 2010 and 2011 to wade through the details of the sampling data and develop general approaches to analyses prior to full PDT meetings.

The Herring PDT continued to discuss data issues and conducted a second review of the sampling data in early/mid 2011, to further investigate sampling and bycatch estimation methods from both the at-sea and portside sampling programs, to consider the intensity of sampling, to gain a better understanding of how variation in the system may be influencing the analyses. This second phase of the PDT assessment (see Appendix IIB in Volume II) will frame the recommendations in Amendment 5 regarding how portside sampling data can continue to be utilized to improve catch monitoring and bycatch estimation in the herring fishery. In general, the analysis shows that there is better agreement than previously thought between the two programs with respect to river herring bycatch estimation, although problems exist with specific portside methods. It will be important to identify and consider the strengths and weaknesses of both programs in order to determine the best way to combine the programs and generate the most precise estimate of bycatch, especially since a large component of the "bycatch" in this fishery is landed. However, sea sampling remains the best method for estimating bycatch and provides important information about catch and the operation of the fishery that cannot be generated from a portside sampling program.

During 2011, Council staff worked with NMFS NERO staff and the Herring PDT to review available data and develop/analyze potential management alternatives that capture the Council's intent with respect to the range of alternatives that was approved in January 2011. To streamline the Amendment 5 document and promote ease of understanding, several elements of the Amendment 5 measures were "packaged" into the range of alternatives that will be incorporated into the Draft EIS. Each management alternative under consideration includes measures/options that:

1. Establish targets/priorities for annually allocating observer coverage sea days on limited access herring vessels (Categories A/B/C when on a declared herring trip);
2. Specify a process through which the distribution of observer days is evaluated and considered annually by the Council relative to other priorities and funding needs;
3. Specify a funding source (and any related provisions) for observer days that may be required beyond those that can be funded using Federal resources; and
4. Establish provisions for utilizing observer service providers and authorizing waivers, if necessary.

Once the general range of alternatives was approved in January 2011, the Herring PDT began to develop a more focused method of evaluating the approaches under consideration and assessing the potential impacts on the Atlantic herring fishery.

6.2.1.3 Standardized Bycatch Reporting Methodology (SBRM)

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. The SBRM provides a structured approach for evaluating the efficacy of the allocation of observer coverage (sea days) to multiple fisheries (52 fleets) to monitor a large number of species (15 SBRM species groups) under the 13 different fishery management plans, the Marine Mammal Protection Act, and the Endangered Species Act.

The purpose of the SBRM amendment was to:

- Explain methods and processes by which bycatch is currently monitored and assessed
- Determine whether the current methods/processes need to be modified and/or supplemented
- Establish standards for precision of bycatch estimates for all Northeast Region fisheries, thereby documenting the SBRM

The SBRM Amendment addressed:

- Bycatch reporting and monitoring mechanisms
- Analytical techniques and allocation of at-sea observers
- SBRM performance standard
- Review and reporting process
- FWA and provisions for annual specifications
- Prioritization process
- Provisions for industry-funded observers and observer set-aside programs

A more detailed discussion regarding the SBRM can be found in Appendix III (Volume II).

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.

6.2.1.4 Precision Versus Accuracy

An important consideration regarding the alternatives to allocate observer coverage on limited access herring vessels relates to understanding precision targets. CVs (coefficients of variation) provide a convenient way to compare the relative uncertainty of two estimates (lower is better), but they must be interpreted carefully. Assuming a normal distribution, ***doubling*** the CV produces the approximate 95% confidence interval. For example, a CV of ***0.30*** for a bycatch estimate (or 30%) means that if the data could be re-sampled or re-collected, the resulting new estimate would be within **± *60%*** of the original estimate 95% of the time (the other 5% of the time the new estimate would be more than 60% different). Also, by not including certain sources of uncertainty (e.g. within-tow variability from basket sampling, fish stratification, other factors), the true uncertainty is even greater than what is suggested by SBRM calculations of CV.

- The Council is clearly interested in generating both precise and accurate estimates of catch and bycatch in the Atlantic herring fishery. The SBRM methodology relies on a ratio estimator, which carries an inherent bias that is inversely proportional to the sample size (i.e. more samples yields a smaller bias). Despite this slight bias, the ratio estimator is still desirable because it uses information about the total amount of catch to minimize the uncertainty surrounding the bycatch estimate. However, for this benefit to occur there has to be a positive relationship between the amount of bycatch and the total amount of catch. If this relationship does not exist, then the ratio estimator may not be an appropriate method of estimating bycatch in this fishery.

- There are costs associated with increasing the precision of bycatch estimates resulting from observer data. A more precise (lower target CV) estimate will require more sea days or observer trips. When observed bycatch events are infrequent yet highly variable, the additional sampling coverage required may be substantial. This tradeoff between precise estimates and the cost of sampling coverage must be thoroughly explored when designing an appropriate observer program and prioritizing available resources. It is important to consider, especially with respect to river herring bycatch, the relative costs and benefits of a very precise estimate. For example, Table 11 in Appendix III (*Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*, see appendix in Volume II) shows that the GOM Purse Seine fleet removed 4,548 lbs of river herring in 2010 (3% of total removals by the directed herring fishery). The CV of this estimate is relatively high at 0.72. The spatial analysis suggests provided by the Herring PDT during the development of the measures to address river herring bycatch suggests that this segment of the fleet has been observed to have only minor encounters with river herring (see more detailed information in Volume II, Appendix IV, Herring PDT Analysis: Development of Measures to Address River Herring Bycatch). Therefore, increasing the precision for this strata would require more observer coverage but may provide only minimal improvements in the overall precision of river herring bycatch estimates.
- The Herring PDT acknowledges the challenges associated with determining coverage levels and allocating limited sampling resources to achieve target CVs in all strata, particularly in the herring fishery where variability is significant both spatially and temporally. Moreover, the management measures proposed in Amendment 5 could require some sub-areas within the SBRM strata to require observer coverage, consequently moving the entire system away from a random stratified design and towards a more systematic sampling approach designed to meet certain objectives, which should be more clearly specified in the document. This will complicate the development of options designed to achieve target levels of precision across all strata in the fishery. Some bycatch problems can be moving targets, varying seasonally or annually due to regulations, environmental factors, and species abundance. Over the long-term, the process for optimizing the allocation of observer resources requires flexibility and adaptability.

6.2.2 Impacts on Atlantic Herring

6.2.2.1 Impacts of Alternative 1 (No Action) on Atlantic Herring

The no action alternative would allocate observer coverage on limited access herring vessels through the current optimization/allocation process, based on the Omnibus Standardized Bycatch Reporting Methodology (SBRM) amendment (and any future modifications/revisions). 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 was vacated and all regulations implemented by the SBRM Omnibus Amendment final rule (73 FR 4736, January 28, 2008) were removed.

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

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The Atlantic herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action alternative in this case is not likely to affect removals of Atlantic herring from the fishery, and the impacts of the no action alternative on the herring resource are expected to be neutral.

There may, however, be positive impacts on the Atlantic herring resource from implementing one or more of the alternatives under consideration; while the benefits to the resource may be difficult to quantify with respect to each of the alternatives under consideration, they would not be realized under the no action alternative. Long-term benefits to the herring resource could result from increased observer coverage, increased sampling, a reduction in unobserved catch, and an increase in the accuracy of catch estimates that result from observer sampling. As catch information improves, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The quantification of previously unaccounted mortality could improve the data used in assessments, thereby decreasing scientific uncertainty, albeit to an unknown degree. In addition, reducing the likelihood for errors in the calculation of catch statistics through increased sampling could reduce

management uncertainty (uncertainty about catch estimates is a component of management uncertainty) and management of the herring fishery may improve.

6.2.2.2 Impacts of Alternative 2 (*Preferred Alternative* – 100% Observer Coverage Category A/B Vessels) on Atlantic Herring

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

This alternative would require the greatest amount of observer coverage for the majority of the herring fleet. Alternative 2 was considered/analyzed in the Amendment 5 DEIS *with and without* the inclusion of the Category C vessels. Ultimately, the Council chose to apply the requirements in this alternative only to Category A/B vessels. The Council's rationale for selecting this alternative is discussed in Section 3.2.1.2 of this document.

All of the alternatives related to allocating observer coverage on limited access herring vessels, including the ***Preferred Alternative***, have the potential to improve the precision of estimates of catch, discards, and/or landed bycatch. The alternatives are not expected to affect total removals from the Atlantic herring fishery, so over the long-term, increased observer coverage on limited access herring vessels may only have marginal effects on herring abundance. Direct impacts on the herring resource, when compared to the status quo, are therefore expected to be minimal.

There are, however, indirect benefits to the Atlantic herring resource that could result from increased observer coverage, increased sampling, a reduction in unobserved catch, and an increase in the accuracy of catch estimates that result from observer sampling. As catch information improves, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The quantification of previously unaccounted mortality could improve the data used in assessments, thereby decreasing scientific uncertainty, albeit to an unknown degree. In addition, reducing the likelihood for errors in the calculation of catch statistics through increased sampling could reduce management uncertainty (uncertainty around catch estimates is a component of management uncertainty) and management of the herring fishery may improve.

The proposed funding provisions (Option 1 – No Action, ***Preferred Alternative Year 1***; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers are not expected to impact the herring resource. Funding Option 1 includes only federal funds and represents the status quo. However, it is important to acknowledge that the coverage levels desired under this alternative (100%) may not be achieved under Funding Option 1. This option is intended to be a placeholder until the long-term ***Preferred Alternative***, Funding Option 2, can be implemented. Funding Option 2 could have a negative impact if the quality of data collected by at-sea observers is compromised by using independent service providers. The Council's intent with respect to these provisions is to increase sea sampling for the limited access herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data. It is expected, and recommended by the NEFOP, that States adhere to the same standards and protocols if the option is selected to authorize states in Amendment 5 as service providers.

Development of an industry-funded observer program under Funding Option 2 (***Preferred Alternative***) will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The service provider requirements/standards proposed in this amendment are consistent with those utilized in other industry-funded programs in the Northeast Region. The proposed provisions for service providers and authorizing waivers would only be necessary under Funding Option 2. Under the ***Preferred Alternative***, the industry-funded program would require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be developed by the NEFOP, in order to provide consistency across data collection. Since States are proposed to be authorized as service providers under the ***Preferred Alternative***, standards and protocols should be consistent as well. Therefore, the impact of the funding options and options related to utilizing service providers on the Atlantic herring resource are expected to be neutral.

Overall, the benefits to the Atlantic herring resource would likely be greatest under the ***Preferred Alternative*** relative to the other alternatives because it proposes the highest level of observer coverage and increases the likelihood of better documenting herring catch. The ***Preferred Alternative***, with respect to the no action alternative, is also likely to have a *positive* impact. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses).

6.2.2.3 Impacts of Alternative 3 on Atlantic Herring

Alternative 3 proposes to require SBRM levels at a minimum for the fleets that most represent the limited access herring fishery: *New England Midwater Trawl, Mid-Atlantic Midwater Trawl, and New England Purse Seine.*

Benefits to the Atlantic herring resource related to increased observer coverage are discussed in the previous subsection under Alternative 2 and relate to Alternative 3 to the extent that this alternative would increase observer coverage beyond current/recent levels, and to the extent that the fleets affected by this alternative are inclusive of limited access herring vessels. Recent SBRM coverage levels are provided below. The relationship between the SBRM fleets and the limited access herring vessels is discussed in Section 6.2.6.4 of this document (Impacts of Alternative 3 on Fishery-Related Businesses and Communities).

Recent Coverage Levels

Table 132 summarizes the number of Northeast Fisheries Observer Program (NEFOP) and Vessel Trip Report (VTR) trips and percentage observer coverage, by the 52 SBRM fleets for the SBRM 2009 (July 2007 – June 2008), 2010 (July 2008 – June 2009), and 2011 (July 2009 – June 2010) years. Dark shading in Table 132 indicates fleets that were not considered or fleets with no NEFOP trips in the annual SBRM analyses. Light shading indicates confidential data. Recent coverage levels for the fleets in Table 132 that would be affected by this alternative are shown in lines 26 (New England Purse Seine), 35 (Mid-Atlantic Midwater Trawl), and 36 (New England Midwater Trawl). It is not clear if/how Alternative 3 would increase observer coverage beyond current/recent levels.

Table 132 Number of NEFOP and VTR Trips and Percentage Observer Coverage for SBRM 2009, 2012, and 2011 Years

						SBRM 2009						SBRM 2010						SBRM 2011					
						NEFOP			% Coverage			NEFOP			% Coverage			NEFOP			% Coverage		
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	FISH	PSPP	VTR	FISH	PSPP	Pilot	FISH	PSPP	VTR	FISH	PSPP	Pilot	FISH	PSPP	VTR	FISH	PSPP	Pilot
1	Longline	OPEN	all	MA	all	3	3	132	2.3	2.3	P			139			P			151			P
2	Longline	OPEN	all	NE	all	92	92	1,076	8.6	8.6		87	88	872	10.0	10.1		119	119	1,043	11.4	11.4	
3	Hand Line	OPEN	all	MA	all		1	3,584		<0.1	P			3,182			P		1	3,485		<0.1	P
4	Hand Line	OPEN	all	NE	all	3	3	2,094	0.1	0.1	P	12	14	2,427	0.5	0.6		13	15	2,295	0.6	0.7	
5	Otter Trawl	OPEN	all	MA	sm	187	188	4,151	4.5	4.5		150	150	3,831	3.9	3.9		277	282	3,805	7.3	7.4	
6	Otter Trawl	OPEN	all	MA	lg	168	170	6,090	2.8	2.8		120	122	6,144	2.0	2.0		201	204	5,689	3.5	3.6	
7	Otter Trawl	OPEN	all	NE	sm	67	67	3,656	1.8	1.8		124	129	3,259	3.8	4.0		268	271	3,668	7.3	7.4	
8	Otter Trawl	OPEN	all	NE	lg	672	674	11,392	5.9	5.9		814	815	10,308	7.9	7.9		829	835	10,395	8.0	8.0	
9	Scallop Trawl	AA	GEN	MA	all	5	5	93	5.4	5.4	P	2	2	84	2.4	2.4	P			124			P
10	Scallop Trawl	AA	LIM	MA	all	2	2	14	14.3	14.3	P			5			P			11			P
11	Scallop Trawl	OPEN	GEN	MA	all	10	10	804	1.2	1.2	P	19	19	890	2.1	2.1	P	6	6	455	1.3	1.3	P
12	Scallop Trawl	OPEN	LIM	MA	all			84			P			36			P			36			P
13	Otter Trawl, Ruhle	OPEN	all	NE	lg									6			P	27	27	9	*	*	
14	Otter Trawl, Haddock Separator	OPEN	all	NE	lg													54	55	13	*	*	
15	Shrimp Trawl	OPEN	all	MA	all			862			P			944			P			443			P
16	Shrimp Trawl	OPEN	all	NE	all	16	16	2,706	0.6	0.6		10	10	1,453	0.7	0.7		16	16	2,533	0.6	0.6	
17	Floating Trap	OPEN	all	MA	all									21			P			16			P
18	Floating Trap	OPEN	all	NE	all									138			P			111			P
19	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	15	313	1,960	0.8	16.0		13	218	1,668	0.8	13.1		6	169	1,883	0.3	9.0	P*
20	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	12	79	839	1.4	9.4		4	78	1,064	0.4	7.3	P*	27	147	1,506	1.8	9.8	
21	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xlg	33	120	2,906	1.1	4.1		47	126	2,419	1.9	5.2		59	103	2,097	2.8	4.9	
22	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	3	3	80	3.8	3.8		2	2	55	3.6	3.6	P			28			P
23	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	150	326	8,147	1.8	4.0	P	238	378	8,846	2.7	4.3		412	506	9,468	4.4	5.3	
24	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xlg	173	246	3,679	4.7	6.7		107	155	3,184	3.4	4.9		235	271	3,399	6.9	8.0	
25	Purse Seine	OPEN	all	MA	all	1	1	227	0.4	0.4	P			211			P			214			P
26	Purse Seine	OPEN	all	NE	all	20	22	343	5.8	6.4		26	33	300	8.7	11.0		25	38	216	11.6	17.6	
27	Scallop Dredge	AA	GEN	MA	all	152	152	916	16.6	16.6		116	116	853	13.6	13.6		4	5	75	5.3	6.7	P
28	Scallop Dredge	AA	GEN	NE	all	75	75	190	39.5	39.5		56	56	105	53.3	53.3				3			P
29	Scallop Dredge	AA	LIM	MA	all	70	70	409	17.1	17.1		99	101	392	25.3	25.8		28	28	350	8.0	8.0	
30	Scallop Dredge	AA	LIM	NE	all	127	127	313	40.6	40.6		132	132	214	61.7	61.7		30	30	137	21.9	21.9	
31	Scallop Dredge	OPEN	GEN	MA	all	25	26	8,679	0.3	0.3		31	31	6,177	0.5	0.5		42	42	3,059	1.4	1.4	
32	Scallop Dredge	OPEN	GEN	NE	all	10	10	3,555	0.3	0.3		13	13	1,957	0.7	0.7		15	15	2,328	0.6	0.6	
33	Scallop Dredge	OPEN	LIM	MA	all	49	49	1,343	3.6	3.6		65	65	1,054	6.2	6.2		49	53	1,115	4.4	4.8	
34	Scallop Dredge	OPEN	LIM	NE	all	77	77	1,637	4.7	4.7		69	69	1,082	6.4	6.4		63	63	1,037	6.1	6.1	
35	Mid-water Paired & Single Trawl	OPEN	all	MA	all	1	3	44	2.3	6.8	P	2	2	70	2.9	2.9	P	3	4	25	12.0	16.0	P
36	Mid-water Paired & Single Trawl	OPEN	all	NE	all	46	49	302	15.2	16.2		64	78	313	20.4	24.9		99	125	310	31.9	40.3	
37	Pots and Traps, Fish	OPEN	all	MA	all	2	2	1,283	0.2	0.2	P			1,183			P			1,050			P
38	Pots and Traps, Fish	OPEN	all	NE	all	1	1	848	0.1	0.1	P	3	3	508	0.6	0.6	P	5	5	479	1.0	1.0	P
39	Pots and Traps, Conch	OPEN	all	MA	all		1	641		0.2	P			586			P			751			P
40	Pots and Traps, Conch	OPEN	all	NE	all			679			P			652			P			764			P

Source: NEFSC SBRM Three-Year Review Report (2011).

Table 132 **continued. Number of NEFOP and VTR Trips and Percentage Observer Coverage for SBRM 2009, 2012, and 2011 Years**

						SBRM 2009						SBRM 2010						SBRM 2011					
						NEFOP			% Coverage			NEFOP			% Coverage			NEFOP			% Coverage		
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	FISH	PSPP	VTR	FISH	PSPP	Pilot	FISH	PSPP	VTR	FISH	PSPP	Pilot	FISH	PSPP	VTR	FISH	PSPP	Pilot
41	Pots and Traps, Hagfish	OPEN	all	MA	all	3	3	23	13.0	13.0	P			18			P			1			P
42	Pots and Traps, Hagfish	OPEN	all	NE	all	7	7	157	4.5	4.5		12	12	129	9.3	9.3		10	10	89	11.2	11.2	
43	Pots and Traps, Shrimp	OPEN	all	NE	all									122			P			232			P
44	Pots and Traps, Lobster	OPEN	all	MA	all			2,809			P			2,697			P			2,523			P
45	Pots and Traps, Lobster	OPEN	all	NE	all			29,214			P	1	1	27,232	<0.1	<0.1	P			27,994			P
46	Pots and Traps, Crab	OPEN	all	MA	all	1	1	126	0.8	0.8	P	1	1	46	2.2	2.2	P			112			P
47	Pots and Traps, Crab	OPEN	all	NE	all			106			P	1	1	122	0.8	0.8	P			203			P
48	Beam Trawl	OPEN	all	MA	all									230			P			160			P
49	Beam Trawl	OPEN	all	NE	all									118			P			134			P
50	Dredge, Other	OPEN	all	MA	all									261			P			457			P
51	Ocean Quahog/Surf Clam Dredge	OPEN	all	MA	all			3,725			P			2,012			P			1,712			P
52	Ocean Quahog/Surf Clam Dredge	OPEN	all	NE	all			2,744			P			917			P			1,150			P
				Total for Rows 1 to 52		**2,278**	**2,994**	**114,662**	**2.0**	**2.6**		**2,440**	**3,020**	**100,536**	**2.4**	**3.0**		**2,923**	**3,446**	**99,343**	**2.9**	**3.5**	
53	Hand Line	AA	all	MA	all							1	1		*	*							
54	Scallop Trawl	AA	LIM	NE	all	1	1	3	33.3	33.3		1	1	5	20.0	20.0		1	1	3	33.3	33.3	
55	Scallop Trawl	OPEN	LIM	NE	all			7				1	1	6	16.7	16.7				5			
56	Twin Trawl	OPEN	all	MA	all							2	2		*	*		1	1		*	*	
57	Twin Trawl	OPEN	all	NE	all													1	1		*	*	
58	Troll Line, Other	OPEN	all	MA	all	1	1		*	*													
59	Beach Seine	OPEN	all	MA	all	53	55	1	*	*		6	7		*	*		8	8		*	*	
60	Purse Seine, Menhaden	OPEN	all	MA	all	1	5		*	*		6	7		*	*		3	3		*	*	
61	Purse Seine, Menhaden	OPEN	all	NE	all														1			*	
				Total for Rows 1 to 61		**2,334**	**3,056**	**114,673**	**2.0**	**2.7**		**2,457**	**3,039**	**100,547**	**2.4**	**3.0**		**2,937**	**3,461**	**99,351**	**3.0**	**3.5**	

Source: NEFSC SBRM Three-Year Review Report (2011).

Alternative 3 simply requires SBRM levels as minimum levels of coverage for the affected fleets; additional coverage may occur, the extent to which is unknown. 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, and the outcome of this process is currently unknown. The impacts of this alternative on the herring resource are therefore *unknown*, but *potentially low positive* (relative to taking no action) if sampling is increased to a level that increases the precision of catch/bycatch estimates. For reasons discussed under the ***Preferred Alternative*** (Alternative 2, see previous sub-section), the proposed funding provisions (Option 1 – No Action; Option 2 – Federal and Industry Funds) and the provisions for utilizing service providers and authorizing waivers would not affect this determination. It is not clear that additional funding or service providers would be necessary under this alternative.

6.2.2.4 Impacts of Alternative 4 on Atlantic Herring

Alternative 4 proposes to allocate observer coverage on limited access herring vessels based on the following targets/priorities identified by the New England Fishery Management Council: a 30% CV on catch estimates for Atlantic herring and haddock, and a 20% CV on catch estimates for river herring. The alternative would utilize a process that includes a supplemental analysis developed by either the NEFSC or the Herring PDT. The options related to the technical group responsible for providing a supplemental analysis under this alternative are neutral with respect to the impacts on the Atlantic herring resource.

Positive impacts on the Atlantic herring resource related to increased observer coverage are discussed in the previous subsection under Alternative 2 (***Preferred Alternative***) and relate to Alternative 4 to the extent that Alternative 4 would increase observer coverage *above* current/recent levels. To explore the potential impacts of Alternative 4, the Herring PDT developed a preliminary analysis and example approach to determining levels of observer coverage necessary to meet a specific goal. VTR and observer data from the 2010 fishing year were analyzed with formulae similar to those specified by the SBRM amendment to calculate variance and to estimate the number of trips necessary to achieve certain levels of precision for river herring, haddock, and Atlantic herring over a range of desired CVs. This example helps to better illustrate the trade-offs associated with the choices that would need to be made, based on goals and priorities for observer coverage as well as available resources. This exercise also shows how the SBRM can be used to develop a statistical approach to sampling the herring fishery to meet a specific goal under this option for observer coverage levels. The complete Herring PDT analysis is provided in Appendix III of this document in Volume II (*Impacts of Alternatives Under Consideration in Amendment 5 to Allocate Observer Coverage on Limited Access Herring Vessels*). Results with respect to the herring resource are summarized/discussed below.

2010 observer coverage rates calculated in the Herring PDT analysis (based on the strata identified in Appendix III, Volume II) for Atlantic herring are provided in Table 133. It should be noted that number of observed and total number of trips will vary as the geographic stratification are different by species group. Overall, observer coverage in both number of trips and percentage were higher in 2010 than in reports for other years (Cieri, et al. 2008. Wigley et al, 2009).

Table 133 Total Trips by Fishery, Landings, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Atlantic Herring)

Total Trips by fishery

Trips	Gear			
Area	BT	PS	MWT	Total
CC/GB	3	3	126	132
GOM	143	159	108	410
SNE	60		113	173
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
CC/GB	34,138	200,000	43,452,304	43,686,442
GOM	763,766	16,567,910	40,534,010	57,865,686
SNE	7,586,649		42,811,557	50,398,206
Total	8,384,553	16,767,910	126,797,871	151,950,334

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
CC/GB	15	91	19,706	19,812
GOM	346	7,514	18,383	26,243
SNE	3,441	0	19,416	22,856
Total	3,803	7,604	57,505	68,912

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
CC/GB	2	0	88	90
GOM	6	21	31	58
SNE	3		24	27
Total	11	21	143	175

% Coverage

	Gear		
Area	BT	PS	MWT
CC/GB	67	0	70
GOM	4	13	29
SNE	5		21

Improbable
No coverage

The numbers of observed trips in Table 133 can then be compared to the coverage rates predicted by the Herring PDT's example approach in Appendix III to achieve all three of the target precision estimates (Atlantic herring, haddock, and river herring) specified in Alternative 4 (Table 134 below). This provides some perspective on the difference between recent (2010) observer coverage in the limited access herring fishery and the coverage that may be needed to achieve all three of the CV targets specified under Alternative 4.

For each stratum identified by the Herring PDT, the highest number of trips required to achieve the three management goals was used to generate the estimates in Table 134. However, in the case of river herring, the geographic stratification differences in management Area 1B and 3 need to be accounted for (see further discussion in Appendix III). To accomplish this, a proration in number of trips needed in the Cape Cod (for river herring) and the Cape Cod/Georges bank (for haddock) strata was used. This proration was based on the percentage of landings which occur in those areas (Table 134).

Table 134 Combined Trips, Average Length of Trips, and Total Observer Days Needed to Meet CV Targets by Strata (Based on 2010)

Trips needed

Area	BT	PS	MWT	Total
CC	3	3	15	21
GB	7	[redacted]	71	78
CC/GB	10	3	86	99
GOM	7	105	68	180
SNE	17	[redacted]	75	92
total	34	108	228	371

Average days per trip

Area	BT	PS	MWT	Total
CC	2	3	2	7
GB	3	[redacted]	3	6
GOM	2	2	2	6
SNE	2	[redacted]	4	6
total	4	2	6	12

Total days

Area	BT	PS	MWT	Total
CC	6	9	30	45
GB	21	[redacted]	212	234
CC/GB	27	9	243	279
GOM	11	211	135	357
SNE	34	[redacted]	298	332
total	72	220	676	968

Note: This only includes at-sea time, and not transport to dock, set-up time, etc. for observers. Also, CC and GB are listed singly and combined (see text) as CC/Georges Bank.

In general, the Herring PDT's analysis shows that the limited access herring fishery experienced higher levels of observer coverage in 2010 than in previous years (Cieri et al. 2008 and Wigley et al. 2009), and lower variability resulted from the catch/bycatch estimates generated from the observer data. In addition, the degree of variability associated with the catch estimates extrapolated from the 2010 coverage was less (see Appendix III in Volume II). It should be noted, however, that the year to year variability is not captured in this method. Cieri et al. 2008 and others have documented a high degree of variability within the same strata used by the PDT across fishing years. Undoubtedly, fishing patterns, management actions, and availability of the fish to the fishery affect the estimates of removals and the variability associated with catch estimates. As such should the levels of coverage suggested here be achieved, there is no guarantee that management targets on CV will be met. This analysis is only one example of the types of analyses that can be brought to bear on the issue of bycatch in the directed herring fishery. It should be viewed as a supplement, not a replacement, of the SBRM. However, using this sort of analysis can allow managers to tailor at-sea observer coverage to meet the species management goals and needs of the Atlantic herring fishery.

The proposed funding provisions (Option 1 – No Action, ***Preferred Alternative Year 1***; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers are not expected to impact the herring resource. Funding Option 1 includes only federal funds and represents the status quo. However, it is important to acknowledge that the coverage levels desired under this alternative (100%) may not be achieved under Funding Option 1. This option is intended to be a placeholder until the long-term ***Preferred Alternative***, Funding Option 2, can be implemented. Funding Option 2 could have a negative impact if the quality of data collected by at-sea observers is compromised by using independent service providers. However, the intent with respect to the proposed provisions is to increase sea sampling for the limited access A/B herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data. It is expected, and recommended by the NEFOP, that States adhere to the same standards and protocols if the option is selected to authorize states in Amendment 5 as service providers.

Development of an industry-funded observer program under Funding Option 2 (***Preferred Alternative***) will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The service provider requirements/standards proposed in this amendment are consistent with those utilized in other industry-funded programs in the Northeast Region. The proposed provisions for service providers and authorizing waivers would only be necessary under Funding Option 2. Under Funding Option 2, the industry-funded program would require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be developed by the NEFOP, in order to provide consistency across data collection. If the option is selected to authorize States as service providers under Funding Option 2, standards and protocols should be consistent as well. Therefore, the impact of the funding options and options related to utilizing service providers on the herring resource are expected to be neutral.

The numbers in the tables presented above suggest that observer coverage rates would likely increase above recent (2010) levels to achieve the desired CV targets under Alternative 4. To achieve all three targets, using the PDT's example, coverage would target about 99 trips in the Cape Cod/Georges Bank area, 180 trips in the Gulf of Maine, and 92 trips in southern New England (versus 90, 58, and 27 trips in these areas, respectively, in 2010 – see Table 133). If this is the case, at-sea sampling of the herring fishery will increase, and impacts on the herring resource are expected to be positive for reasons previously discussed (see discussion under Alternative 2). The level of coverage would be determined

annually under this alternative and may vary, so the extent of the related impacts may vary as well from year to year. Overall, though, the alternative is expected to have a *low positive* impact on the herring resource when compared to the no action alternative. Positive impacts on herring are likely to be greater under Alternative 4 than Alternative 3 (the impacts of Alternative 3 are generally unknown but potentially low positive), and less than under Alternative 2. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses).

6.2.3 Impacts on Non-Target Species and Other Fisheries

6.2.3.1 Impacts of Alternative 1 (No Action) on Non-Target Species and Other Fisheries

The no action alternative would allocate observer coverage on limited access herring vessels through the current optimization/allocation process. The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment) and include river herring, mackerel, and multispecies (groundfish). The no action alternative proposes to continue the current process for allocating observers and would not be expected to result in any additional impacts on non-target species and other fisheries.

These alternatives are intended to improve sampling in the limited access herring fishery and increase precision associated with catch/bycatch estimates of non-target species. There may be indirect benefits that would result from improvements to catch sampling, increased sampling, a reduction in unobserved catch, and an increase in the accuracy of bycatch estimates that result from observer sampling. These benefits are discussed in the previous section of this analysis and relate to improving catch data for stock assessments and enhancing long-term management. The specific benefits on non-target species and other fisheries are difficult to quantify with respect to each of the alternatives under consideration but may not be realized under the no action alternative.

6.2.3.2 Impacts Alternative 2 (***Preferred Alternative*** – 100% Observer Coverage Category A/B Vessels) on Non-Target Species and Other Fisheries

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment) and include river herring, mackerel, and multispecies (groundfish). Alternative 2 (***Preferred Alternative***) proposes to require NMFS-approved observers on every trip taken by limited access Category A and B herring vessels unless they are declared out of the fishery through VMS. This alternative would require the greatest amount of observer coverage for the majority of the herring fleet. Alternative 2 was considered/analyzed in the Amendment 5 DEIS with and without the inclusion of the Category C vessels. Ultimately, the Council chose to apply the requirements in this alternative only to Category A/B vessels. The Council's rationale for selecting this alternative is discussed in Section 3.2.1.2 of this document.

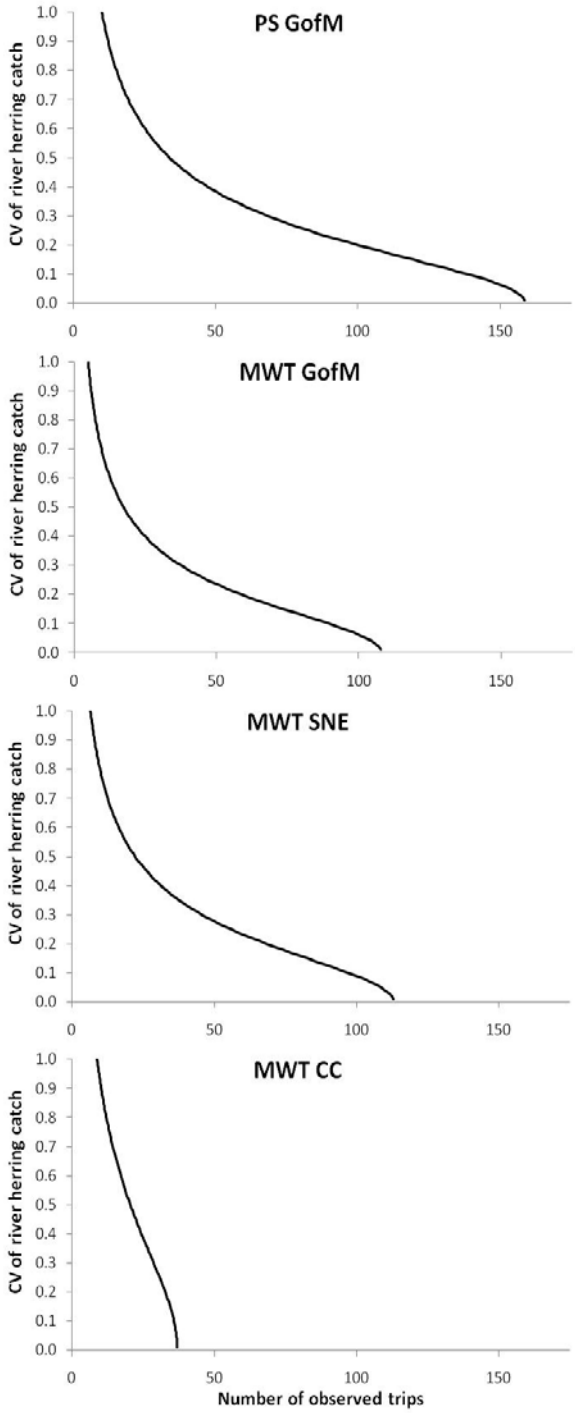
Requiring 100% observer coverage on Category A and B vessels would represent a census of the majority of herring catch from the limited access Atlantic herring fishery, which, in theory, should result in a very low CV on estimates of bycatch. Because of the variability inherent in sampling of this fishery, it may be difficult, if not impossible, to generate bycatch estimates for non-target species like river herring with a CV at or near zero. There is not agreement across scientific literature about what sufficient levels of observer coverage may be, especially in high-volume fisheries where most bycatch is retained and landed. More observer coverage is clearly favored to increase precision and capture rare events. 100% observer coverage is usually regarded as ideal to accurately report bycatch and determine discard rates, but is financially challenging and may not be feasible for a variety of reasons. At minimum, "adequate" levels of observer coverage should be un-biased (taking into account non-random sampling and potential changes in fishermen's behavior in the presence of observers).

"Diminishing Returns"

While the impacts on non-target species and other fisheries are expected to be positive under this alternative (and any other alternatives that increase observer coverage above recent/current levels), an important consideration regarding all observer allocation programs is that there are diminishing returns related to increasing observer coverage to very high levels (see Figure 75 for an illustration of this with respect to river herring CVs). Additional investment in observer coverage essentially "buys" more precise estimates; however, the gains are small at higher levels of coverage. The greatest "bang-for-the-buck" occurs when the curve in Figure 75 is steep; these points occur to the left side of the graphs in Figure 75. When observer coverage approaches 100% (as proposed in Alternative 2), the CV goes to zero since this estimate essentially becomes a census of bycatch in the fishery. Increased coverage, however, does not affect the quality of the data collected through the observer program, so this alternative is still likely to result in the most positive impact when compared to the other alternatives under consideration. However, it will be important to keep this relationship between observer coverage and precision in mind when evaluating the costs and benefits of requiring very high levels of observer coverage.

The Herring PDT notes that previous and ongoing analyses of coverage in the herring fishery suggests that a sizable increase in observer coverage does not always yield an expected increase in precision, due to the inter-annual variability in the abundance of Atlantic herring, bycatch species and how the fishery is prosecuted. The pre-trip notification system for the entire limited access herring fleet proposed in Amendment 5 should help to improve the predictability of fishing trips and the SBRM because the fleet's activity can be gauged on a more real-time basis.

Figure 75 Relationship Between Precision Surrounding Estimates of River Herring Bycatch and the Number of Observed Trips



Framework 46 – Haddock Catch Cap

The Final Rule for Framework 46 to the Multispecies (Groundfish) FMP became effective on September 14, 2011. This action modified the haddock catch cap provisions for herring midwater trawl vessels originally adopted in FW 43. Under Framework 46, catches of haddock by midwater trawl vessels fishing in Herring 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 catch cap is applied based on the multispecies fishing year (May 1 through April 30) and totals 1 percent of the Acceptable Biological Catch (ABC) of each haddock stock. Midwater trawl vessels fishing in Management Areas 1A, 1B, and 3 are required to report total kept catch by haddock stock area and gear used. This information is used by NMFS to extrapolate observer information to an estimate of total haddock catch.

The method used by NMFS to monitor haddock catch on herring midwater trawl vessels is the same as that used to monitor butterfish catch in the Longfin squid fishery. Information presented in Section 5.5.1 of this document (description of Fishery-Related Businesses) suggests Category A and B herring vessels represent the majority of the midwater trawl fleet. Requiring 100% observer coverage on limited access Category A and B vessels (***Preferred Alternative***) would increase coverage levels related to the haddock catch cap and would likely increase precision associated with estimating haddock catch for the herring midwater trawl fleet. This may lead to more effective real-time management of haddock bycatch in the Atlantic herring fishery and would therefore have a positive impact.

Funding Options and Provisions for Service Providers

The funding provisions (Option 1 – No Action, ***Preferred Alternative*** Year 1; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers are not expected to impact non-target species and other fisheries for reasons discussed in the following paragraphs.

There may be concern that if no action is taken with respect to funding observer days, Option 1 could shift sea sampling resources away from other fisheries, possibly compromising the precision of catch estimates for some non-target species/other fisheries. However, Option 1 states that:

> While observer coverage may be ***desired*** or ***targeted*** at a higher rate, realized annual coverage would be based on the allocation of Federal resources and would be subject to prioritization in the face of funding limitations. This option equates to the status quo with respect to funding observer coverage in the limited access herring fishery.

If Federal resources are limited during Year 1 under Option 1, the Council and NMFS would consider the trade-offs associated with shifting funds/days when specifying observer allocations for all fleets. Option 1 does not mandate that days be shifted from other fisheries; it is assumed that allocations would be made annually based on the availability of Federal funds for all fleets in the region; this occurs annually through the current SBRM optimization/allocation process. This option is only temporary until the details of the industry-funded program required under Option 2 can be implemented (one year following the implementation of Amendment 5).

Funding Option 2 (***Preferred Alternative***) could have a negative impact if the quality of data collected by at-sea observers is compromised by using independent service providers. However, the intent with respect to these provisions is to increase sea sampling for the limited access Category A and B herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data. It is expected, and recommended by the NEFOP, that States adhere to the same standards and protocols if the option is adopted to authorize states in Amendment 5 as service providers.

Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The service provider requirements/standards proposed in this amendment are consistent with those utilized in other industry-funded programs in the Northeast Region. The proposed provisions for service providers and authorizing waivers would only be necessary under Funding Option 2 (***Preferred Alternative***). Under Funding Option 2, the industry-funded program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be developed by the NEFOP, in order to provide consistency across data collection. If the option is selected to authorize States as service providers under Funding Option 2, standards and protocols should be consistent as well. Therefore, the impact of the funding options and options related to utilizing service providers on non-target species and other fisheries are expected to be neutral.

Conclusions

Relative to taking no action (Alternative 1), Alternative 2 ***(Preferred Alternative)*** would have a *positive* impact on non-target species and other fisheries from the significant increase in coverage and sampling that would result under 100% coverage of limited access herring vessels. The benefits to non-target species would likely be greatest under Alternative 2 relative to the other alternatives because it proposes the highest level of observer coverage and increases the likelihood of better documenting catch at-sea. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses)).

6.2.3.3 Impacts of Alternative 3 on Non-Target Species and Other Fisheries

Alternative 3 proposes to require SBRM levels at a minimum for the fleets that most represent the limited access herring fishery: New England Midwater Trawl, Mid-Atlantic Midwater Trawl, and New England Purse Seine.

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment) and include river herring, mackerel, and multispecies (groundfish). In general, the impacts of this alternative on non-target species and other fisheries are unknown at this time with regards to Alternative 1 (no action). Requiring SBRM levels of observer coverage for the limited access Atlantic herring fishery may yield improved estimates of bycatch of some non-target species due to increased sample sizes. However, because Alternative 3 simply requires the SBRM levels to be minimum levels of coverage, this alternative resembles the status quo; it is unclear what additional coverage would result from adopting this approach, so additional impacts on non-target species and other fisheries cannot be predicted with any certainty.

The impacts of this alternative on non-target species and other fisheries are therefore *unknown*, but likely *neutral* (relative to taking no action). For reasons discussed under Alternative 2 (above), proposed funding provisions (Option 1 – No Action, ***Preferred Alternative Year 1***; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers would not affect this determination. It is not clear that additional funding or service providers would be necessary under this alternative.

6.2.3.4 Impacts of Alternative 4 on Non-Target Species and Other Fisheries

Alternative 4 includes a mechanism for either the NEFSC (Option 1) or the Herring PDT (Option 2) to prepare a supplemental analysis to relate SBRM fleets/coverage levels to the limited access herring vessels and evaluate the potential allocation of additional days on these vessels to achieve a 20% CV on river herring catch estimates and a 30% CV on haddock catch estimates and a 30% CV on Atlantic herring discards. The timing of the supplemental analysis would mirror the annual SBRM prioritization process, and the supplemental analysis/report would be presented to the Council by the NEFSC in conjunction with the annual SBRM Sea Day Analysis and Prioritization. The intent of this option is to provide a supplemental process to evaluate the sampling goals and performance standards identified in this amendment without compromising or formally changing the SBRM methodologies or the annual optimization process.

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment) and include river herring, mackerel, and multispecies (groundfish). Alternative 4 would allocate additional observer coverage to specifically address the bycatch of river herring and haddock. This could lead to a greater understanding and reliability of bycatch estimates of these species in this fishery. Alternative 4 would not impact the SBRM allocation scheme (currently under revision), and would therefore not cause other fisheries to be under-sampled. Unlike the SBRM process, however, this alternative incorporates river herring into the methodology for allocating observer coverage on the affected fleets by specifying a target level of precision for river herring catch estimates by these fleets. Overall, Alternative 4 is expected to yield a *positive* impact to non-target species and other fisheries in comparison to Alternative 1 (no action), but likely less of a positive impact than Alternative 2 (***Preferred Alternative***), as it would likely entail less coverage. It is difficult to compare Alternatives 3 and 4 because of the uncertainty in the impact of Alternative 3.

Positive impacts on non-target species and other fisheries related to increased observer coverage are discussed in the previous subsection under Alternative 2 and relate to Alternative 4 to the extent that Alternative 4 would increase observer coverage above current/recent levels. To explore the potential impacts of Alternative 4, the Herring PDT developed a preliminary analysis and example approach to determining levels of observer coverage necessary to meet a specific goal. VTR and observer data from the 2010 fishing year were analyzed with formulae similar to those specified by the SBRM amendment to calculate variance and to estimate the number of trips necessary to achieve certain levels of precision for river herring, haddock, and Atlantic herring over a range of desired CVs. This example helps to better illustrate the trade-offs associated with the choices that would need to be made, based on goals and priorities for observer coverage as well as available resources. This exercise also shows how the SBRM can be used to develop a statistical approach to sampling the herring fishery to meet a specific goal under this option for observer coverage levels. The complete Herring PDT analysis is provided in Appendix III of this document in Volume II (*Impacts of Alternatives Under Consideration in Amendment 5 to Allocate Observer Coverage on Limited Access Herring Vessels*). Results with respect to the river herring and haddock are summarized/discussed below.

2010 observer coverage rates for river herring and haddock, calculated based on the Herring PDT's stratification, are shown in Table 135 and Table 136 respectively. It should be noted that number of observed and total number of trips will vary as the geographic stratification are different by species group. Overall, observer coverage in both number of trips and percentage were higher in 2010 than in reports for other years (Cieri, et al. 2008. Wigley et al, 2009). Implementation of 100% observer coverage in the groundfish zero mortality areas has significantly improved coverage rates even in the adjacent areas. This is due in part to the presence of an at-sea observer on trips where the captain *may* be going into Closed

Area I. However, there were still a number of strata with low to almost no coverage; including bottom trawl gears in Southern New England and the Gulf of Maine.

Table 135 Total Trips by Fishery, Landings, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (River Herring)

Total Trips by fishery

Trips	Gear			
Area	BT	PS	MWT	Total
CC	0	1	37	38
GOM	143	159	108	410
SNE	60		113	173
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
CC	0	20,000	12,298,341	12,318,341
GOM	763,766	16,567,910	40,094,010	57,425,686
SNE	6,029,289		42,222,557	48,251,846
Total	6,793,055	16,587,910	94,614,908	117,995,873

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
CC	0	9	5,577	5,587
GOM	346	7,514	18,183	26,043
SNE	2,734		19,149	21,883
Total	3,081	7,523	42,909	53,513

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
CC			22	22
GOM	5	21	31	57
SNE	3		24	27
Total	8	21	77	106

% Coverage

	Gear		
Area	BT	PS	MWT
CC			59
GOM	3	13	29
SNE	5		21

Improbable
No coverage

Table 136 Landings Total Trips by Fishery, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Haddock)

Total Trips by fishery

	Gear			
Area	BT	PS	MWT	Total
GB	3	3	126	132
GOM	143	159	110	412
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
GB	34,138	200,000	43,452,304	43,686,442
GOM	763,766	16,567,910	41,249,924	58,581,600
Total	797,904	16,767,910	84,702,228	102,268,042

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
GB	15	91	19,706	19,812
GOM	346	7,514	18,707	26,568
Total	362	7,604	38,414	46,380

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
GB	2	[redacted]	88	90
GOM	5	21	30	56
Total	7	21	118	146

% Coverage

	Gear		
Area	BT	PS	MWT
GB	67	[redacted]	70
GOM	3	13	27
	[redacted]	Improbable	

The numbers of observed trips in Table 135 and Table 136 can then be compared to the coverage rates predicted by the Herring PDT's example approach in Appendix III to achieve all three of the target precision estimates (Atlantic herring, haddock, and river herring) specified in Alternative 4 (Table 137 below). This provides some perspective on the difference between recent (2010) observer coverage in the limited access herring fishery and the coverage that may be needed to achieve all three of the CV targets specified under Alternative 4.

For each stratum, the highest number of trips required to achieve the three management goals was used to generate the estimates in Table 137. However in the case of river herring, the geographic stratification differences in management Areas 1B and 3 need to be accounted for (see more information in Appendix III). To accomplish this, a proration in number of trips needed in the Cape Cod (for River herring) and the Cape Cod/Georges bank (for haddock) strata was used. This proration was based on the percentage of landings that occur in those areas (Table 137).

Table 137 Combined Trips, Average Length of Trips, and Total Observer Days Needed to Meet CV Targets by Strata (Based on 2010)

Trips needed

Area	BT	PS	MWT	Total
CC	3	3	15	21
GB	7	[redacted]	71	78
CC/GB	10	3	86	99
GOM	7	105	68	180
SNE	17	[redacted]	75	92
total	34	108	228	371

Average days per trip

Area	BT	PS	MWT	Total
CC	2	3	2	7
GB	3	[redacted]	3	6
GOM	2	2	2	6
SNE	2	[redacted]	4	6
total	4	2	6	12

Total days

Area	BT	PS	MWT	Total
CC	6	9	30	45
GB	21	[redacted]	212	234
CC/GB	27	9	243	279
GOM	11	211	135	357
SNE	34	[redacted]	298	332
total	72	220	676	968

Note: This only includes at-sea time, and not transport to dock, set-up time, etc. for observers. Also, CC and GB are listed singly and combined (see text) as CC/Georges Bank.

In general, the Herring PDT's analysis shows that the limited access herring fishery experienced higher levels of observer coverage in 2010 than in previous years (Cieri et al. 2008 and Wigley et al. 2009), and lower variability resulted from the catch/bycatch estimates generated from the observer data (see bycatch estimates and CVs in Appendix III). In addition, the degree of variability associated with the catch estimates extrapolated from the 2010 coverage was less. It should be noted, however, that the year to year variability is not captured in this method. Cieri et al. 2008 and others have documented a high degree of variability within the same strata used by the PDT across fishing years. Undoubtedly, fishing patterns, management actions, and availability of the fish to the fishery affect the estimates of removals and the variability associated with catch estimates. As such, should the levels of coverage suggested here be achieved, there is no guarantee that management targets on CV will be met. This analysis is only one example of the types of analyses that can be brought to bear on the issue of bycatch in the directed herring fishery. It should be viewed as a supplement, not a replacement, of the SBRM. However, using this sort of analysis can allow managers to tailor at-sea observer coverage to meet the species management goals and needs of the herring fishery.

Framework 46 – Haddock Catch Cap

The Final Rule for Framework 46 to the Multispecies (Groundfish) FMP became effective on September 14, 2011. This action modified the haddock catch cap provisions for herring midwater trawl vessels originally adopted in FW 43. Under Framework 46, catches of haddock by midwater trawl vessels fishing in Herring 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 catch cap is applied based on the multispecies fishing year (May 1 through April 30) and totals 1 percent of the Acceptable Biological Catch (ABC) of each haddock stock. Midwater trawl vessels fishing in Management Areas 1A, 1B, and 3 are required to report total kept catch by haddock stock area and gear used. This information is used by NMFS to extrapolate observer information to an estimate of total haddock catch.

The method used by NMFS to monitor haddock catch on herring midwater trawl vessels is the same as that used to monitor butterfish catch in the Longfin squid fishery. The Herring PDT analysis (provided in Appendix III and summarized above) suggests that observer coverage rates would likely increase above recent (2010) levels to achieve the desired CV targets under Alternative 4. This would increase coverage levels related to the haddock catch cap and would likely increase precision associated with estimating haddock catch for the herring midwater trawl fleet. This may lead to more effective real-time management of haddock bycatch in the herring fishery and would therefore have a positive impact.

Funding Options and Provisions for Service Providers

The funding provisions (Option 1 – No Action, ***Preferred Alternative*** Year 1; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers are not expected to impact determinations regarding impacts on non-target species and other fisheries. Funding Option 2 could have a negative impact if the quality of data collected by at-sea observers is compromised by using independent service providers. However, the intent with respect to these alternatives is to increase sea sampling for the limited access herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data. It is expected, and recommended by the NEFOP, that States adhere to the same standards and protocols if States are authorized in Amendment 5 as service providers.

Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The service provider requirements/standards proposed in this amendment are consistent with those utilized in other industry-funded programs in the Northeast Region. The proposed provisions for service providers and authorizing waivers would only be necessary under Funding Option 2. Under Funding Option 2, the industry-funded program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be developed by the NEFOP, in order to provide consistency across data collection. If the option is selected to authorize States as service providers under Funding Option 2, standards and protocols should be consistent as well. Therefore, the impact of the funding options and options related to utilizing service providers on non-target species and other fisheries are expected to be neutral.

Conclusions

The numbers in the tables presented above suggest that observer coverage rates would likely increase above recent (2010) levels to achieve the desired CV targets under Alternative 4. To achieve all three targets, using the Herring PDT's example provided in the analysis, coverage would target about 99 trips in the Cape Cod/Georges Bank area, 180 trips in the Gulf of Maine, and 92 trips in southern New England (versus 90, 58, and 27 trips in these areas, respectively, in 2010 – see Table 133). Under Alternative 4, it is likely that sea sampling of the limited access herring fishery will increase, and impacts on non-target species and other fisheries are expected to be *positive* for reasons previously discussed. The level of coverage would be determined annually under this alternative and may vary, so the extent of the related impacts may vary as well from year to year. Overall, though, the alternative is expected to have a *positive* impact on non-target species and other fisheries when compared to the no action alternative. Positive impacts on non-target species are likely to be greater under Alternative 4 than Alternative 3 (the impacts of Alternative 3 are generally unknown), and less than under Alternative 2. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses).

6.2.4 Impacts on Physical Environment and EFH

6.2.4.1 Impacts of Alternative 1 (No Action) on Physical Environment and EFH

Alternative 1 would maintain the current system of determining observer coverage levels. Since this alternative represents the status quo, no changes in the impacts on seabed habitats are expected because current management measures to protect them would remain in place. Specifically, adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would likely continue to be minimal and temporary if this alternative is selected.

6.2.4.2 Impacts Alternative 2 (***Preferred Alternative*** – 100% Observer Coverage Category A/B Vessels) on Physical Environment and EFH

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

This alternative would require the greatest amount of observer coverage for the majority of the herring fleet. Alternative 2 was considered/analyzed in the Amendment 5 DEIS with and without the inclusion of the Category C vessels. Ultimately, the Council chose to apply the requirements in this alternative only to Category A/B vessels. The Council's rationale for selecting this alternative is discussed in Section 3.2.1.2 of this document.

This alternative could lead to a decrease in herring trips if industry funding is required and vessels are unwilling or unable to absorb the cost of observer coverage, given expected revenues and other costs. Adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would likely continue to be minimal and temporary if this alternative is selected, with regards to Alternative 1 (no action). Alternatives 3 and 4 are expected to have the same impact as this alternative.

6.2.4.3 Impacts of Alternative 3 on Physical Environment and EFH

Alternative 3 would increase observer coverage levels to those specified in the SBRM amendment, at a minimum, with two funding options: federal (Option 1) and federal/industry (Option 2), and an additional option to certify states as observer service providers (Option 1 would not authorize states; Option 2 would authorize states). This alternative could lead to a decrease in herring trips if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues, although there would be less of a decrease expected as compared to 100% coverage proposed in Alternative 2. Adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would likely continue to be minimal and temporary if this alternative is selected, with regards to Alternative 1 (no action). Alternatives 2 and 4 are expected to have the same impact as this alternative.

6.2.4.4 Impacts of Alternative 4 on Physical Environment and EFH

Alternative 4 would allocate observer coverage based on Council-specified targets and priorities, with two funding options: federal (Option 1) and federal/industry (Option 2), and an additional option to certify states as observer service providers (option 1 would not authorize states; Option 2 would authorize states). This alternative would allow for additional analyses and recommendations from either the NEFSC or the Herring PDT to supplement SBRM coverage recommendations. As above, this alternative could lead to a decrease in herring trips if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues, although there would be less of a decrease expected as compared to 100% coverage. Adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would likely continue to be minimal and temporary if this alternative is selected, with regards to Alternative 1 (no action). Alternatives 2 and 3 are expected to have the same impact as this alternative.

6.2.5 Impacts on Protected Resources

6.2.5.1 Impacts of Alternative 1 (No Action) on Protected Resources

Under Alternative 1, no additional management measures would be implemented in Amendment 5 that would change observer coverage on limited access herring vessels. 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 was vacated and all regulations implemented by the SBRM Omnibus Amendment final rule (73 FR 4736, January 28, 2008) were removed.

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

No additional impacts are expected on protected resources above the current status quo, as the management measures currently in place would be maintained. If Alternative 2 or Alternative 4 are implemented, there would be the potential for a low positive impact when compared to this no action alternative by increasing the amount of information gathered, although Alternative 2 (***Preferred Alternative***) would likely provide more observer coverage and therefore potentially capture more rare protected resources encounters. Uncertainty regarding the impact of Alternative 3 makes it difficult to compare to the other alternatives.

6.2.5.2 Impacts Alternative 2 (*Preferred Alternative* – 100% Observer Coverage Category A/B Vessels) on Protected Resources

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

This alternative would require the greatest amount of observer coverage for the majority of the herring fleet. Alternative 2 was considered/analyzed in the Amendment 5 DEIS with and without the inclusion of the Category C vessels. Ultimately, the Council chose to apply the requirements in this alternative only to Category A/B vessels. The Council's rationale for selecting this alternative is discussed in Section 3.2.1.2 of this document.

This alternative has the potential to have a low positive impact on protected resources. There is likely to be no increase or decrease in effort, but as was stated in the impacts on non-target and other species, 100% observer coverage on Category A and B herring vessels would represent a census of the majority of landings from the limited access Atlantic herring fishery. The measure has the potential to therefore provide as much information as possible on any and all protected resources that were encountered by the fishery, to the extent that a service provider could sample. A problem for protected resources, however, is similar to the problem with non-target and other species, where the variability inherent in sampling of this fishery makes it difficult, if not impossible, to generate bycatch estimates with a CV at or near zero. More observer coverage, however, would capture the rarer events of encounters of protected species with the herring fisheries, and therefore has the potential to improve general knowledge of them.

The funding provisions (Option 1 – No Action, ***Preferred Alternative*** Year 1; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers are not expected to impact protected resources for reasons discussed in the following paragraphs.

There may be concern that if no action is taken with respect to funding observer days, Option 1 could shift sea sampling resources away from other fisheries, possibly compromising information gathered on protected resources in the other fisheries. However, Option 1 states that:

> While observer coverage may be desired or targeted at a higher rate, realized annual coverage would be based on the allocation of Federal resources and would be subject to prioritization in the face of funding limitations. This option equates to the status quo with respect to funding observer coverage in the limited access herring fishery.

If Federal resources are limited during the first year of Amendment 5 implementation under Option 1, the Council and NMFS would consider the trade-offs associated with shifting funds/days when specifying observer allocations for all fleets, including considerations of protected resources. Option 1 does not mandate that days be shifted from other fisheries; it is assumed that allocations would be made annually based on the availability of Federal funds for all fleets in the region; this occurs annually through the current SBRM optimization/allocation process. Therefore, there would be no expected impacts to protected resources from Option 1, as data collection on the species would be considered equally among the fisheries. Option 1 is only intended to be a placeholder until the details of the industry-funded component of Option 2 can be developed and implemented (one year following the implementation of Amendment 5).

Funding Option 2 (***Preferred Alternative***) could have a negative impact if the quality of data collected by at-sea observers is compromised by using independent service providers. However, the intent with respect to these alternatives is to increase sea sampling for the limited access herring fishery based on the standards and protocols developed by the Northeast Fisheries Observer Program (NEFOP) so that any additional data collected by service providers would be comparable to NEFOP data on, including protected resource data. Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The service provider requirements/standards proposed in this amendment are consistent with those utilized in other industry-funded programs in the Northeast Region. The proposed provisions for service providers and authorizing waivers would only be necessary under Funding Option 2. Under Funding Option 2, the industry-funded program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be developed by the NEFOP, in order to provide consistency across data collection. If the option is selected to authorize States as service providers under Funding Option 2, standards and protocols should be consistent as well. Therefore, the impact of the funding options and options related to utilizing service providers on protected resources are expected to be neutral.

Overall, in comparison to the no action alternative, Alternative 2 ***(Preferred Alternative)*** has the potential to have a *low positive* impact on protected species by increasing the likelihood of capturing rare events and therefore increasing the information that is gathered, which could lead to an increase in the amount of knowledge with respect to those species. This benefit is likely to be higher than the benefit of Alternative 4, which has the potential to provide less observer coverage than the ***Preferred Alternative***. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses). The uncertainty regarding the impact of Alternative 3 (discussed below) makes it difficult to compare to the other alternatives.

6.2.5.3 Impacts of Alternative 3 on Protected Resources

This alternative requires SBRM levels as minimum levels of coverage for the affected fleets; additional coverage may occur, the extent to which is unknown. This measure will likely not increase or decrease effort in the fishery. Although this alternative has the potential to have a low positive impact on protected resources through the collection of more information on protected resources encountered by the herring fishery (in comparison to Alternative 1, no action), it resembles the status quo by simply requiring the SBRM levels to be minimum levels of coverage. It is therefore unclear what additional coverage would result from adopting this approach, and therefore the impact of Alternative 3, in comparison to Alternative 1 (no action) is unknown at this time. For reasons discussed under Alternative 2 (***Preferred Alternative*** above), the proposed funding provisions (Option 1 – No Action, ***Preferred Alternative Year 1***; Option 2 – Federal and Industry Funds, ***Preferred Alternative***) and the proposed provisions for utilizing service providers and authorizing waivers would not affect this determination. It is not clear that additional funding or service providers would be necessary under this alternative. The unknown impact of this alternative also makes it difficult to compare to the other alternatives.

6.2.5.4 Impacts of Alternative 4 on Protected Resources

Alternative 4 would allocate additional observer coverage to specifically address the bycatch of river herring and haddock; it would also not impact the SBRM allocation scheme (as discussed above), and would therefore not cause other fisheries to be under-sampled. Consequently, Alternative 4 has the potential to have a low positive impact on protected resources through observer's capture of rare encounter events, which would thereby increase the collection of more information on protected resources encountered by the herring fishery (in comparison to Alternative 1, the no action alternative). The measure is also not likely to increase or decrease effort in the fishery, thereby not increasing or decreasing the chance of encounters of protected resources. The capture of rare events, however, may not increase in comparable magnitude to Alternative 2 (***Preferred Alternative***), and therefore the low positive impact of Alternative 4 is likely to be less than Alternative 2. Alternative 3 is difficult to compare to Alternative 4 due to the uncertainty of the impact of Alternative 3. The impact of Alternative 4, overall, is likely to be a low positive impact when compared to the no action alternative. The selection of permit categories to which the observer allocation alternatives may apply (A/B versus A/B/C) is not likely to affect this determination because Category A and B vessels land 98-99% of all herring in a given fishing year (see information presented in Section 5.5.1 of this document (Fishery-Related Businesses).

6.2.6 Impacts on Fishery-Related Businesses and Communities

The alternatives proposed to allocate observer coverage in the limited access herring fishery are intended, in part, to reduce the likelihood for errors in the calculation of catch statistics. This could lead to reductions in management uncertainty when setting ACLs (uncertainty about catch estimates is a component of management uncertainty), and long-term management of the Atlantic herring fishery may improve. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty. To the extent that scientific and management uncertainty can be reduced, additional yield can be made available to the herring fishery through the specification-setting process (ACLs and sub-ACLs). The long-term impacts of reducing scientific and management uncertainty are positive for fishery-related businesses and communities, including both the directed herring fishery-related businesses and those relying on herring as forage. This generally applies to all alternatives that result in improved catch statistics.

The impacts of proposed funding provisions are discussed in the following subsection and apply to any alternatives under consideration that would require additional funding. Under Funding Option 1 (***Preferred Alternative*** for Year 1), Alternatives 2-4 are expected to have a neutral effect on fishery-related businesses and communities with respect to Alternative 1 (no action). Under Funding Option 2 (***Preferred Alternative***), Alternative 2 (***Preferred Alternative – 100% coverage on A/B vessels***) is likely to have the largest negative impacts on fishery-related businesses and communities. Alternative 4 is likely to have negative impacts, although the size of these impacts is depends on the Council-specified targets/priorities. Alternative 3 is likely to have unknown or potentially low negative impacts on fishery-related business and communities. Options for Observer Service Providers are likely to have neutral impacts on fishery-related businesses. Impacts on fishery-related businesses and communities are discussed relative to each alternative/option in the following subsections.

6.2.6.1 Impacts of Options for Funding and Provisions for Utilizing Service Providers on Fishery-Related Businesses and Communities

Amendment 5 considered alternatives that would require additional observer coverage on herring limited access vessels and options that may require some/all of the additional coverage to be funded by the fishing industry. **Alternative 2** ***(Preferred Alternative)*** proposes 100% observer coverage on limited access Category A and B herring vessels, which would require additional funds. Alternative 3 and Alternative 4 may also require additional funds to achieve the desired levels of coverage.

The impacts of Alternatives 1-4 on fishery-related businesses and communities depends on the amount of industry funds required. The impacts of the funding provisions are discussed below and apply to any alternatives under consideration that would require additional funding. Relative to the no action alternative (Alternative 1), all of the other alternatives are likely to require additional funds if they are implemented as long-term strategies to allocate observer coverage . Alternative 2 (***Preferred Alternative***) would likely require the most funding; followed by Alternative 4, and then Alternative 3. Alternative 3 would likely require coverage at levels that are closest to the status quo/no action alternative; industry funds or service providers may not be necessary under Alternative 3.

Funding Options

Option 1: No Action (*Preferred Alternative*, Year 1 only)

Option 2: Federal and Industry Funds (*Preferred Alternative*)

The Council proposes to phase-in the industry-funded component of the program, one year following the implementation of Amendment 5, and to target a maximum contribution from the industry of $325 per sea day.

Option 1 (No Action) is not expected to result in any additional impacts on fishery-related businesses and communities relative to the true no action alternative for Year 1 because it represents the status quo and maintains the status quo with respect to funding observer days. Option 1 states that:

> While observer coverage may be ***desired*** or ***targeted*** at a higher rate, realized annual coverage would be based on the allocation of Federal resources and would be subject to prioritization in the face of funding limitations. This option equates to the status quo with respect to funding observer coverage in the limited access herring fishery.

If Federal resources are limited under Funding Option 1, the Council and NMFS would consider the trade-offs associated with shifting funds/days when specifying observer allocations for all fleets. Option 1 does not mandate that the days specified by the allocation approach be achieved; it is assumed that allocations would be made annually based on the availability of Federal funds for all fleets in the region; this occurs annually through the current process. Moreover, Option 1 is intended to be a temporary placeholder until the details of the industry-funded monitoring program are implemented (one year following implementation of Amendment 5). This approach is intended to mitigate some of the negative impacts on fishery-related businesses and communities from the requirements for 100% observer coverage.

Under Option 1, waivers would be granted for trips when Federal observers cannot be deployed. Waivers would not be authorized for trips by Category A and B vessels in the proposed River Herring Monitoring/Avoidance Areas (Section 3.3.2), so Category A/B vessels would be prohibited from fishing in these areas if an observer cannot be deployed. This may impact some vessels on a trip-by-trip basis, but the impacts cannot be predicted at this time and are expected to be relatively minor because the provision does not prohibit the vessels from fishing altogether, and the rule is intended to apply only for the first year following the implementation of Amendment 5. Therefore, the impacts of this option are still expected to be neutral for fishery-related businesses and communities.

Funding Option 2: General Costs

Under Funding Option 2 (***Preferred Alternative***), requirements for 100% observer coverage on Category A and B vessels would be funded through a combination of Federal and industry funds. The Council has determined that under Funding Option 2, the industry-funded component of the Amendment 5 monitoring program will be developed and implemented one year following the implementation of Amendment 5 and will target a maximum contribution by the industry of $325 per sea day.

An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be further developed by the NEFOP, in order to provide consistency across data collection.

The full costs of a NEFOP observer is approximately $1,200 per sea day. This includes costs associated with observer training, salaries and benefits, facility costs, observer gear, equipment costs, insurance costs, travel and trip deployment costs, data processing (editing, auditing, loading) and data quality assurance program costs (NEFOP, 2012).

In order to place the costs of industry-funded observers into context for decision-making in Amendment 5, Table 138 summarizes average revenues per trip, average revenues per day absent, operating costs per trip, and operating costs per day absent, classified by gear type for Category A/B/C herring vessels during 2008-2010 on trips landing 2,000 pounds or more Atlantic herring. Revenues were calculated using the VTR and Dealer data, while operating costs were based on data collected through the observer program. Operating costs in this fishery are primarily fuel expenses; the price of fuel has fluctuated (along with the price of crude oil) over the past three years. There has been very little observer coverage for Category A/B/C vessels using bottom trawl gear to fish for Atlantic herring. The bottom trawl trips which have been observed have tended to be shorter in length than those not observed (and reported through VTRs).

Table 138 2008-2010 Average Revenues/Costs Per Day and Average Revenues/Costs Per Trip for Category A/B/C Herring Vessels

	Revenue/Day	Revenue/Trip	Operating Costs/Day	Operating Costs/Trip
Single Midwater Trawl	$12,853	$41,721	$4,271	$12,608
Pair Trawl	$15,683	$43,166	$3,295	$9,372
Purse Seine	$18,557	$25,499	$1,798	$2,746
Bottom Trawl	$5,325	$7,863	$785	$524

Revenue Data is from VTR and Dealer (n=5,329)
Operating Costs data is from Observer (n=352)

Relative to the daily operating costs for the fishery, the cost of an observer for limited access herring vessels is fairly high. For example, a NEFOP observer would increase the per-day costs of A/B/C single midwater trawl, pair trawl, purse seine and bottom trawl by 28%, 36%, 67%, and 153% respectively (Table 139). However, relative to daily revenues, the cost of an observer is lower; an observer would cost 9%, 9%, 6%, and 22% of average daily revenues for the A/B/C midwater, pair trawl, purse seine, and bottom trawl vessels respectively. These figures are presented for illustration; it is possible that the type of data required in this fishery would result in higher or lower per-day costs than the $1,200 amount used.

Table 139 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs for Category A/B/C Herring Vessels

	Revenue	Costs
Single Midwater Trawl	9.3%	28.1%
Pair Trawl	7.7%	36.4%
Purse Seine	6.5%	66.7%
Bottom Trawl	22.5%	152.8%

The Council's ***Preferred Alternative*** in Amendment 5 requires 100% observer coverage for Category A and B herring vessels only (not Category C, included in the above analysis). Table 140 summarizes average revenues per trip, average revenues per day absent, operating costs per trip, and operating costs per day absent, classified by gear type for only Category A and B herring vessels only during 2008-2010 on trips landing 2,000 pounds or more Atlantic herring. Revenues were calculated using the VTR and Dealer data, while operating costs were based on data collected through the observer program (same as above). The numbers provided in Table 140 are very similar to those in Table 138 because there were not very many trips observed on Category C vessels that landed 2,000 pounds or more Atlantic herring during these years (vessels with Category B and C permits were binned as B vessels).

Table 140 2008-2010 Average Revenues/Costs Per Day and Average Revenues/Costs Per Trip for Category A and B Herring Vessels

	Revenue/Day	Revenue/Trip	Operating Costs/Day	Operating Costs/Trip
Single Midwater Trawl	$12,853	$41,721	$4,271	$12,608
Pair Trawl	$15,683	$43,166	$3,295	$9,372
Purse Seine	$19,326	$27,646	$1,798	$2,746
Bottom Trawl	$5,539	$9,565	$785	$524

Revenue Data is from VTR and Dealer (n=5,329)
Operating Costs data is from Observer (n=352)

Relative to the daily operating costs for the fishery, the cost of an observer for limited access herring vessels is fairly high. For example, at full cost, a NEFOP observer would increase the per-day costs of Category A and B single midwater trawl, pair trawl, purse seine and bottom trawl by 28%, 36%, 67%, and 153% respectively (Table 141). If the industry contribution is limited to $325 per sea day, the impact on revenues and operating costs is greatly reduced (8%, 11%, 19%, and 45% for midwater trawl, pair trawl, purse seine, and bottom trawl, respectively. The impacts of the industry-funded element of the monitoring program will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5).

Similar to the tables presented above for all limited access herring vessels, relative to daily revenues, the cost of an observer is lower; the full cost of an observer would represent about 9%, 8%, 6%, and 22% of average daily revenues for the Category A and B midwater, pair trawl, purse seine, and bottom trawl vessels respectively and significantly less if the industry contribution is $325 per sea day (Table 141). These figures are presented for illustration; it is possible that the type of data required in this fishery could result in higher or lower per-day costs than the $1,200 amount used. The costs of observers and the impacts of the industry-funded element will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5).

Table 141 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs for Category A and B Herring Vessels

Gear	Rev/Day	Cost/Day	Full Cost		$325 Target Cost	
			% of Rev	% of Costs	% of Rev	% of Costs
Midwater Trawl	$12,853	$4,271	9%	28%	3%	8%
Pair Trawl	$15,683	$3,295	8%	36%	2%	11%
Purse Seine	$19,326	$1,798	6%	67%	2%	19%
Bottom Trawl	$5,539	$785	22%	153%	6%	45%

Provisions for Utilizing Service Providers and Authorizing Waivers

The proposed Requirements for Service Providers currently only apply to a Federal sea sampling program, should service providers be utilized to sample the fishery beyond the scope of Federal resources. The Council considered an option to authorize State agencies to be service providers for catch monitoring (sea sampling/observer coverage).

Option 1: No Action. Under the no action option, States would not be authorized in Amendment 5 as service providers for observer coverage. If a State Agency intends to provide sea sampling services for Atlantic herring vessels, it would apply to NMFS to become an authorized service provider, consistent with the provisions specified in 50 CFR 648.11(h) and (i)– *Observer service provider approval and responsibilities* and *Observer certification.*

Option 2 *(Preferred Alternative)*: States Authorized as Service Providers. Under this option, Amendment 5 would authorize all States in the Northeast Region as service providers for sea sampling on limited access Atlantic herring vessels (i.e., States would be "grandfathered" in as service providers). States would not be required to apply to NMFS for an authorization and comply with the provisions specified in 50 CFR 648.11(h) and (i).

Currently, the States are not providing observer services (i.e. are not acting as observer service providers for the federally funded observer program). The State of Maine does have an employee that collects data at sea in the Atlantic herring fishery, but the other states do not cover the herring fleet, although to a limited degree cover other fisheries. If State Agencies are interested in becoming a certified observer service provider, under the no action option, the States would need to acquire NMFS approval and follow the same procedures as any other service providers. The approval process would be very similar to that of non-state observer service providers as it asks for general standards and operational details for hiring and deploying observers, which need to be clear regardless of who is applying.

Under Option 2 (***Preferred Alternative***), the States would be grandfathered into the program, and would not be required to apply for approval. This option would limit the amount of information that is obtained and pre-defined, and the State Agencies' operational details would be unknown. NEFOP personnel have expressed support for Option 1 (no action) to ensure that State Agencies adhere to the same requirements as other service providers, should service providers be utilized for sea sampling in the herring fishery. It remains unclear what qualifications, insurance, observer support would be offered under Option 2. It is possible that the type of data required in this fishery or the costs of coverage could be higher or lower per day than the $1200 based on the rates set by service providers and level of funding acquired once the proposed action is identified. These details are important in the development of an observer program and will affect successful data collection.

Provisions for Observer Service Providers are likely to have neutral impacts on fishery-related businesses because, as proposed, they simply define the standards for approval of additional service providers for industry-funded observer coverage. During the public comment period on the Amendment 5 Draft EIS, Council staff will work with NMFS NERO and NEFOP staff to review the current provisions and requirements for service providers (50 CFR 648.11(h) and (i)– *Observer service provider approval and responsibilities* and *Observer certification*), based primarily on the observer program for the sea scallop fishery. Prior to final decision-making, Council staff will brief the Council on any substantive changes to be made to the regulations in order to accommodate an industry-funded observer program that utilizes service providers in the herring fishery, should the Council select to establish one in this amendment.

6.2.6.2 Impacts of Alternative 1 (No Action) on Fishery-Related Businesses and Communities

The no action alternative would allocate observer coverage on limited access herring vessels through the current optimization/allocation process. The allocation of days would continue to be based on Federal funds. Analyses related to the SBRM are provided in Appendix III of this document (Volume II).

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 was vacated and all regulations implemented by the SBRM Omnibus Amendment final rule (73 FR 4736, January 28, 2008) were removed.

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

The alternatives under consideration to allocate observer coverage in the herring fishery are intended, in part, to reduce the likelihood for errors in the calculation of catch statistics when compared to the no action alternative. As discussed in previous sections of this analysis, improved catch data could lead to reductions in management uncertainty when setting ACLs for the fishery. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty. To the extent that scientific and management uncertainty can be reduced, additional yield can be made available to the herring fishery through the specification-setting process (ACLs and sub-ACLs). The long-term impacts of reducing scientific and management uncertainty are positive for fishery-related businesses and communities. These benefits may not be realized under the no action alternative.

However, under some alternatives under consideration to allocate observer days on limited access herring vessels, the costs of increasing observer coverage may be funded by the fishing industry (Funding Option 2). This would represent negative, and possibly large negative, impacts on fishery-related businesses, depending on which alternative is selected (see below). These costs to fishery-related businesses and communities are foregone under the no action alternative. No additional negative impacts are therefore expected. Additionally, interviews with industry participants indicate that the current allocation of

observer coverage is regarded as fair and adaptable to changes. Since this methodology also applies to other fisheries, herring fishery participants do not feel unduly targeted.

6.2.6.3 Impacts Alternative 2 (*Preferred Alternative* – 100% Observer Coverage Category A/B Vessels) on Fishery-Related Businesses and Communities

As described throughout Section 3.2.1.2, the targets/priorities for allocating coverage under the ***Preferred Alternative*** are 100% of declared herring trips on Category A/B vessels. The provisions for reviewing/allocating/prioritizing coverage include a requirement to review the 100% requirement two years after implementation. Observer coverage will be funded under the No Action option for one year, while the Council develops/implements the option that utilizes both Federal and industry funds, with a target maximum contribution by the industry of $325 per sea day. The Federal/industry funding option (Option 2) is intended to become effective one year following the implementation of Amendment 5. While the details of the industry-funded program are developed, waivers will be granted if an observer cannot be provided within 24 hours of the vessels' notification of the prospective trip. Waivers will not be granted to Category A and B vessels if the trip is to include tows in areas/times associated with measures to avoid or protect river herring (i.e., proposed River Herring Monitoring/Avoidance Areas, Figure 2 – Figure 7, Section 3.3.2). Category A and B vessels would be required to indicate their intention to fish in the proposed River Herring Monitoring/Avoidance Areas as part of the pre-trip notification requirements (Section 3.1.4.2).

This alternative would require the greatest amount of observer coverage for the majority of the herring fleet. Alternative 2 was considered/analyzed in the Amendment 5 DEIS with and without the inclusion of the Category C vessels. Impacts on Category C vessels are discussed separately to the extent possible in the following analysis. Ultimately, the Council chose to apply the requirements in this alternative only to Category A/B vessels. The Council's rationale for selecting this alternative is discussed in Section 3.2.1.2 of this document.

Alternative 2 requires 100% observer coverage on limited access Category A and B herring vessels and would create negative impacts on herring-related businesses or communities if Federal funds are not used to pay for the additional observer coverage. Under Funding Option 1 (no action), the presumption is that Federal funds would be utilized. Under Funding Option 2, industry funds would be required to cover costs when Federal funds were unavailable; therefore, negative impacts on fishery participants are likely. These increased economic costs would result in less effort, lower landings, and affect the supply of herring bait in other fisheries. It would also negatively affect the businesses that supply (directed) herring-related businesses, and the communities whose economies are partially reliant on them (see the profiles for the Amendment 5 communities of interest, provided in Section 5.5.3.2 of this document). The target maximum contribution from the industry is $325 per sea day (discussed below).

In 2010, a NEFOP observer costs approximately $1,200 per day (see discussion in Section 6.2.6.1 for more information and discussion of impacts of the funding options and provisions for utilizing service providers on fishery-related businesses and communities). If industry members were required to pay for observers for every fishing day, this would increase operating costs by 28-153% (see Table 139). Costs are also evaluated relative to the proposed target contribution of $325 per sea day (see Table 141). The impacts of the industry-funded element of the monitoring program will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5).

Category A/B Versus Category C Vessels

Information about herring fishing vessels presented in the Affected Environment (Section 5.5.1) indicates that Category A herring vessels represent the vast majority of the fishery, landing more than 97% of the herring in 2010. The four limited access Category B vessels, all of which also hold Category C permits, landed approximately 1% of all herring during the 2010 fishing year. The 55 Category C vessels that participate in various fisheries and catch herring incidentally, representing about 1% of the total herring landings in 2010. The costs of incorporating the additional 55 Category C vessels into an industry-funded observer program for the herring fishery should be considered relative to the goals of the monitoring program and the expected outcomes, especially given the level of participation by these vessels in the herring fishery.

To illustrate this and provide some perspective on costs associated with 100% observer coverage, data provided by Maine DMR was used to calculate the total number of days fished by each limited access herring vessel for 2007-2009. These were then aggregated by permit category. Results are presented in Table 142. **Based on information from the 2009 fishing year, 100% coverage of Category A/B vessels would cost approximately $2.36M per year (see below).** The herring fishing industry is likely to spend *fewer* days fishing in the future due to reductions in catch limits since 2009. Therefore, the cost of at-sea monitoring of the Category A/B vessels reported in this analysis should be regarded as an *upper bound* of the cost of monitoring. However, this also presumes that an observer could be placed on a Category A/B vessel before it began a herring fishing trip, through a Pre-Trip Notification.

Table 142 Aggregate Days Fished and Observer Costs for 2000-2009 by Herring Permit Category

	Category A/B		Category C	
	Days	**Cost**	**Days**	**Cost**
2007	1,700	$2,040,000	151	$181,200
2008	1,564	$1,876,800	22	$26,400
2009	1,969	$2,362,800	96	$115,200

Approximately 50 additional vessels possess limited access Category C permits (25 mt possession limit), but only about 20% (or less) of these vessels were active in the herring fishery from 2007-2009 (landed 2,000 pounds or more herring). Table 143 summarizes the **total number of trips and days fished** by Category C permit holders. The Herring Category C permit holders were extracted from the Permit Databases, then cross-referenced with the Vessel Trip Report data for calendar years 2007, 2008, and 2009. Trips lasting a fraction of a day were rounded up to the next integer value.

Category C vessels are *only* counted in Table 142 (above) if they landed herring on a given fishing trip. Therefore, the cost of observer coverage for Category C vessels should be regarded as a *lower bound* on the actual cost of monitoring these vessels. This analysis presumes that an observer would be placed to a Category C vessel *only* on trips that lands more than 2,000 pounds of herring. If this is not logistically feasible, then it is likely that actual costs will be higher. Category C permit holders are very active in other fisheries. Table 143 summarizes all fishing activity by Category C permit holders. This suggests that costs could increase significantly if monitoring requirements are extended to Category C permit holders on all trips, not just "directed" herring trips.

Table 143 Number of Trips and Days Fished By Category C Herring Permit Holders

Year	Trips	Days Fished
2007	2,832	5,252
2008	3,646	6,896
2009	3,407	6,605

The impacts of the proposed funding provisions are evaluated with and without the inclusion of Category C vessels in Section 6.2.6.1 of this document. Costs are also evaluated relative to the proposed target contribution of $325 per sea day (see Table 141).

In summary, Alternative 2 (***Preferred Alternative***) is likely to have *potentially high negative* impacts on fishery-related businesses and communities (*potentially* because the impacts depend on the funding provisions that are ultimately implemented under Option 2). The negative impacts are also expected to be the greatest under Alternative 2 relative to the other alternatives under consideration in Amendment 5.

6.2.6.4 Impacts of Alternative 3 on Fishery-Related Businesses and Communities

In general, the impacts of this alternative on fishery-related businesses and communities are unknown at this time. If this alternative increases coverage levels above current/recent SBRM levels, and if the industry is required to fund the additional observer coverage (Funding Option 2), negative impacts under this alternative would be experienced by fishery-related businesses and communities. The extent of the impacts would relate to the extent to which fleets affected by this alternative are inclusive of limited access herring vessels. Recent SBRM coverage levels are provided in Section 6.2.2.3 of this document (Impacts of Alternative 3 on Atlantic Herring). The effect that this alternative may have on coverage levels cannot be predicted at this time. The relationship between the SBRM fleets and the limited access herring vessels is discussed below.

Relationship Between SBRM Fleets and Limited Access Herring Vessels

The SBRM is stratified by:

- Quarter (based on date landed)
- Geographic Region (NE/MA based on port of departure)
- Gear Type (based on *negear*, single/pair midwater trawl are combined)
- Mesh Size (>5.5"< for otter trawl and three groups for gillnets)
- Access Area (AA and OPEN)
- Trip Category (General Category/limited access Scallop)

=52 Fleets

Table 144 illustrates the relationship between the SBRM fleets and the limited access herring vessels. This analysis is based on VTR data and uses three metrics to correlate the SBRM Fleets to the limited access herring vessels – number of trips, number of permits, and pounds of fish. This shows whether or not the SBRM fleets – Mid-Atlantic purse seine, New England purse seine, Mid-Atlantic midwater trawl, and New England midwater trawl – are active in the herring fishery and/or other fisheries. The first three rows in the table demonstrate that the Mid-Atlantic purse seine fleet does not correlate with the Atlantic herring fleet; only one Category A and one Category C vessel is represented by the data for this fleet. The Mid-Atlantic purse seine fleet is likely representative of the Atlantic menhaden fishery.

There is a strong relationship between the herring Category A vessels (most of the limited access directed fishery participants) and the New England midwater trawl fleet, the Mid-Atlantic midwater trawl fleet, and the New England purse seine fleet. Therefore, the Herring PDT has determined that the SBRM process and the allocation of days to the New England and Mid-Atlantic midwater trawl and New England purse seine fleets through the SBRM analysis sufficiently covers the majority of the Category A limited access directed herring vessels.

Table 144 Relationship of SBRM Fleets to Herring Limited Access Vessels

SBRM Year	SBRM Fleet	PLAN	CAT	No. Trips	No. Permits	Total Lbs.	Herring Lbs.	Mackerel Lbs.	Squid/Mack/ Butter Lbs.	% of trips	% of permits	% of Lbs.
2010	MA PS			121	5	18,370,430	0	0	0	57.3%	71.4%	55.5%
2010	MA PS	HRG	A	21	1	5,045,000	0	0	0	10.0%	14.3%	15.2%
2010	MA PS	HRG	C	69	1	9,680,000	0	0	0	32.7%	14.3%	29.2%
2010	NE PS			35	6	7,621,685	800,180	0	2,130	11.7%	31.6%	10.0%
2010	NE PS	HRG	A	244	12	67,948,643	57,462,242	0	0	81.3%	63.2%	89.4%
2010	NE PS	HRG	C	21	1	429,850	0	0	0	7.0%	5.3%	0.6%
2010	MA MWT			3	1	250,000	0	0	250,000	4.3%	10.0%	1.1%
2010	MA MWT	HRG	A	65	8	22,115,218	12,732,000	9,233,218	9,383,218	92.9%	80.0%	98.7%
2010	MA MWT	HRG	C	2	1	45,784	0	0	0	2.9%	10.0%	0.2%
2010	NE MWT			9	1	15,529	0	1	14,701	2.9%	6.3%	0.0%
2010	NE MWT	HRG	A	305	15	141,874,785	106,092,660	35,765,850	35,770,150	97.1%	93.8%	100.0%
2011	MA PS			137	4	15,208,302	0	0	0	64.0%	80.0%	61.8%
2011	MA PS	HRG	C	77	1	9,400,000	0	0	0	36.0%	20.0%	38.2%
2011	NE PS			27	9	4,238,560	113,500	0	40	12.5%	39.1%	9.8%
2011	NE PS	HRG	A	146	11	37,696,726	34,476,726	0	0	67.6%	47.8%	87.4%
2011	NE PS	HRG	C	43	3	1,201,078	769,158	1,470	1,470	19.9%	13.0%	2.8%
2011	MA MWT	HRG	A	25	7	8,269,700	3,664,000	4,305,700	4,305,700	100.0%	100.0%	100.0%
2011	NE MWT			6	2	1,269	170	0	254	1.9%	11.1%	0.0%
2011	NE MWT	HRG	A	304	16	155,950,158	143,150,232	12,720,319	12,720,639	98.1%	88.9%	100.0%

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.

Because Alternative 3 simply requires the SBRM levels to be minimum levels of coverage, this alternative resembles the status quo; it is unclear what additional coverage would result from adopting this approach, so additional impacts on fishery-related businesses and communities cannot be predicted with any certainty. The impacts of this alternative on fishery-related businesses and communities are therefore *unknown*. The impacts are potentially low negative if fishery-related businesses and communities are required to fund additional observer coverage under this alternative (the impacts would be experienced primarily by Category A permit holders). It is not clear that additional funding or service providers would be necessary under this alternative.

6.2.6.5 Impacts of Alternative 4 on Fishery-Related Businesses and Communities

Alternative 4 is fully analyzed in Appendix III, Volume II (*Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels)*, and some of the results (trips and observer days that may be needed to achieve desired CV targets) are provided in Sections 6.2.2.4 and 6.2.3.4 of this document).

Alternative 4 would negatively impact herring-related businesses and communities if it is selected with Funding Option 2 (***Preferred Alternative***). The costs of additional observer coverage under this option would be borne by the herring industry. It is not possible to quantify the additional costs and negative impacts under this alternative because the allocation of observer days would be based on an annual analysis of data from the previous year. However, it is expected that the number of days (and therefore the potential costs) would be higher under this alternative than Alternative 1 (and Alternative 3 as well) because the CV targets are more conservative in Alternative 4, which likely would result in higher levels of coverage required for at least some strata. Relative to taking no action, the impact of Alternative 4 on fishery-related businesses and communities, therefore, is expected to be potentially negative. The potential costs to the industry are likely to be less than Alternative 2, however, because Alternative 2 requires 100% observer coverage on Category A and B herring vessels across all strata considered in the analysis.

Category A/B Versus Category C Vessels

The example analysis provided in this document utilized an SBRM-like approach based on 2010 fishing data. Trip records were pulled for the limited access herring fishery, that is, the Category A/B and Category C vessels on trips when they were declared into the herring fishery. Category C vessels are primarily bottom trawl vessels that fish in a variety of fisheries and may only catch herring seasonally and/or incidentally, but they were incorporated into this analysis because they are part of the 100 vessels that represent the limited access herring fishery, the vessels to which the observer allocation alternatives are intended to apply. One of the benefits of the approach embedded in this alternative is that the Council has the flexibility to prioritize and allocate coverage based on the strata it deems most appropriate or most important at the time. If the Council selects this alternative and determines that Category C vessels should not be incorporated into the analysis or the allocation of observer coverage, then it can prioritize coverage for the A/B vessels and the PDT can conduct the supplemental analysis accordingly. At this point, however, the Category C trips that were declared into the herring fishery are incorporated because they represent the limited access trips for 2010; it is expected that the notification requirements proposed in this amendment will help to better target directed herring trips in the future so that the allocation of observers in the fishery can be optimized.

6.3 IMPACTS OF OTHER MEASURES TO ADDRESS CATCH MONITORING AT-SEA (SECTIONS 3.2.2, 3.2.3, AND 3.2.4)

This section addresses the potential impacts of the management measures under consideration in Amendment 5 to address catch monitoring at-sea. In Amendment 5, the Council considered measures to improve/maximize sampling at-sea by NEFOP and/or NMFS-approved observers, as well as a range of options to address net slippage on limited access herring vessels. The Council also considered an alternative that would provide a mechanism for NMFS to utilize the experimental fishery process to determine whether maximized retention (MR) is an appropriate way to improve catch monitoring in the Atlantic herring fishery. The potential impacts of these measures are discussed relative to the valued ecosystem components (VECs) identified in this amendment. The Council's ***Preferred Alternative*** is identified throughout the discussion.

6.3.1 Impacts of Management Measures to Improve/Maximize Sampling At-Sea (Section 3.2.2)

The Council considered two options to improve/maximize sampling at-sea by NMFS-approved observers: (Option 1) no action/status quo; and (Option 2, ***Preferred Alternative***) requirements for a safe sampling station, "reasonable assistance" for observers, notice to observers when pumping may be starting/ending, NMFS-approved observers to be deployed on all vessels on observed trips involving more than one fishing vessel, additional communication between pair trawl vessels, and visual access to the codend/purse seine net for NMFS-approved observers. The impacts of these options relative to the VECs identified in this amendment are discussed below.

6.3.1.1 General Impacts

The measures proposed to improve sea sampling relate directly to the first objective stated in Amendment 5 – to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. Relative to the status quo (Option 1), the measures proposed in Option 2 ***(Preferred Alternative)*** should enhance the observers' ability to perform his/her duties in a safe manner at sea and improve communication between observers, vessel captains, and other captains engaged in the fishing operation. The measures proposed in Option 2 also support the more specific goals/objectives of the catch monitoring program, particularly related to developing a program that will foster support by the herring industry and others concerned about accurate accounts of catch in the fishery.

The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At that time, the Enforcement Committee approved by consensus the options to improve at-sea monitoring, as follows:

- Provide observer with safe sampling station – Yes, and enforceable
- Provide assistance in obtaining basket samples and sorted discards – Yes, and not enforceable
- Bring codend on board whenever possible and open it for the observer to inspect – No
- Provide accurate details about why a bag may be partially pumped/slipped – enforceable
- Provide Observer notice when pumping may be coming to an end – enforceable

6.3.1.2 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action option relative to the management measures to improve/maximize sampling would not be expected to affect the status of the herring resource. Because of the nature of the measures proposed in this section (see additional discussion below), there is no measureable difference expected between the no action option and the options proposed for maximizing sampling at-sea with respect to the Atlantic herring resource.

The management measures to improve/maximize at-sea sampling will likely have *neutral* impact on the Atlantic herring resource. The measures proposed in this section are not likely to affect removals from the herring fishery, so impacts on herring are expected to be neutral with regard to Option 1 (no action). Relative to the no action option, several of the measures proposed in Option 2 ***(Preferred Alternative)*** may provide some additional information on the contents of slipped nets (e.g., 2F – requirement to provide visual access to the codend), discards (e.g., 2B – requirement to provide reasonable assistance to observers; and 2D – requirements for observers on every vessel in a multi-vessel operation), and landed catch (e.g., 2E – requirement for additional communication between pair trawl vessels); however, much of the additional information collected as a result of the measures proposed in Option 2 is likely to be qualitative in nature. That is, none of the proposed measures will provide quantitative information or estimates that are not already being routinely collected. Consequently, this information is not likely to affect the Atlantic herring resource.

6.3.1.3 Impacts on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment). The no action option (Option 1) would maintain status quo, which would not be expected to result in any additional impacts on non-target species and other fisheries. Under the no action option, however, some of the (minor) benefits to non-target species and other fisheries that are expected from the options under consideration in Amendment 5 (see below) would not be realized.

In general, the management measures to improve/maximize at-sea sampling will likely have little impact on non-target species and other fisheries. Relative to the no action option, several of the measures proposed in Option 2 ***(Preferred Alternative)*** may provide some additional information on the contents of slipped nets (e.g., 2F – requirement to provide visual access to the codend), discards (e.g., 2B – requirement to provide reasonable assistance to observers; and 2D – requirements for observers on every vessel in a multi-vessel operation), and landed catch (e.g., 2E – requirement for additional communication between pair trawl vessels); however, much of the additional information collected as a result of the measures proposed in Option 2 is likely to be qualitative in nature. That is, none of the proposed measures will provide quantitative information or estimates that are not already being routinely collected. Similarly, the proposed measures focus on the limited access herring fishery (100 vessels), and none of

the provisions under consideration are likely to produce data that would affect the outcome of future assessments of non-target species. Consequently, this information is not likely to affect non-target species and other fisheries, and the impacts are likely to be *neutral*.

6.3.1.4 Impacts on Physical Environment and EFH

Adoption of new measures to improve/maximize at-sea sampling (Option 2, ***Preferred Alternative***) is not likely to have any adverse effects on EFH, when compared to Option 1 (no action).

6.3.1.5 Impacts on Protected Resources

Option 2 ***(Preferred Alternative)*** has the opportunity to improve observer conditions on vessels and may slightly improve the data collected in comparison to Option 1 (no action), however, from the standpoint of protection and monitoring of protected resources in the area, the changes are administrative in nature, and therefore are not likely to have an effect on protected resources. The no action option (Option 1) would maintain status quo with observation, and because the impacts of the measures (Option 2) are likely to be neutral, there is no expected difference between the no action option and the measures presented with respect to protected resources in the area.

6.3.1.6 Impacts on Fishery-Related Businesses and Communities

Option 1: There are no additional impacts on fishery-related businesses and communities expected from Option 1 (no action/status quo) as the current measures in place to administer observers at sea would remain in place, and the measures proposed in Option 2 are expected to have neutral impacts, so there is no measurable difference between no action and Option 2 with respect to impacts on fishery-related businesses and communities.

Option 2 *(Preferred Alternative)*: In general, the impacts of Option 2 on fishery-related businesses and communities are not expected to be significant and should be neutral when compared to Option 1 (no action). There may be some operational adjustments required by vessel operators and crew to comply with the new provisions; however, the proposed measures codify many of the practices that are already occurring at-sea when vessels take observers on-board. Interviews with captains and representatives/owners of herring businesses suggest that the proposed steps for improving or maximizing sampling at sea are currently a part of every herring vessels' normal operating practices, agreed upon by the fleet. To the extent that there are any vessels who do not comply, this option will make it easier to mandate these steps, thus making certain that observers on every boat have equal opportunity to fully sample the catch. The measures should improve the vessel owner/operator's understanding regarding expectations and the collection of information by observers during a fishing trip, and ensure safe working conditions for observers on all fishing vessels.

For the most part, there should be no differential impacts (by permit category) associated with these measures. Category C vessels may not pump fish, and some adjustments may need to be made for to accommodate the new provisions; such is the case with A/B permit holders who use purse seine gear or small mesh bottom trawls. Relative to the no action option, the provision that is likely to have the most impact on vessels participating in the fishery is the proposed requirement that vessels operators ensure that the observer has visual access to the codend (or purse seine net/bunt) and any of its contents after pumping has ended, before the pump is removed. This could be achieved in a number of ways depending on the size and nature of the fishing vessel, the gear type being utilized, the amount of fish left in the codend, weather, and other conditions. Recent changes to the Closed Area I provisions require vessels to bring all fish on board for sampling, including operational discards. At the time of this writing, only a small number of hauls on midwater trawl vessels have been observed in CA I, as the fleet is just moving into the area for the season. So far, at the end of the haul, vessel operators are cinching up the codend and dumping the operational discards into a tote for sampling by the observer. However, this practice has only been observed on a small number of hauls thus far, and because there is no purse seine activity in/around Closed Area I, it is unknown how this measure may affect purse seine operations what purse seine vessels may need to do to comply with this provision.

The direct pecuniary economic impacts of this option on the participants in limited access herring fishery are expected to be minimal. Any economic impacts to the herring fishery will be through increased administrative and regulatory burden. There may be an economic impact on participants in the fishery if vessels are required to pay for additional observers that may be required under Option 2D (requirements for trips with multiple vessels). However, it is not possible to predict whether or not the vessels would be required to pay for observers as a result of this particular provision; alternatives for allocating observer coverage to limited access herring vessels and options for funding additional observer days are evaluated in Section 6.2 of this document. Overall, the impacts of this option on fishery-related businesses and communities are expected to be *neutral* when compared to the no action option.

6.3.2 Impacts of Measures to Address Net Slippage (Section 3.2.3)

The Council considered several options in this amendment, in addition to the no action option, to address net slippage on Atlantic herring vessels. The Council's ***Preferred Alternative*** is *Option4C: : Full Sampling with Trip Termination After Ten Slippage Events* (Section 3.2.3.4).

For the purposes of this amendment, slippage is defined as:

> *Unobserved catch, i.e., catch that is discarded prior to being observed, sorted, sampled, and/or brought on board the fishing vessel. Slippage can include the release of fish from a codend or seine prior to completion of pumping or the release of an entire catch or bag while the catch is still in the water.*

- Fish that cannot be pumped and that remain in the net at the end of pumping operations are considered to be operational discards and not slipped catch. Observer protocols include documenting fish that remain in the net in a discard log before they are released, and existing regulations require vessel operators to assist the observer in this process. Management measures are under consideration in this amendment to address this issue and improve the observers' ability to inspect nets after pumping to document operational discards.
- Discards that occur at-sea after catch brought on board and sorted are also not considered slipped catch.

The Northeast Fisheries Observer Program (NEFOP) documents ***Released Catch/Catch Not Brought on Board*** as either *operational discards* (fish that cannot be pumped and/or remain in the gear after a successful pump – i.e., "left in net after pumping," "fell out of gear when pumps were switched"), *partial slippage* (some fish were kept – i.e., "vessel capacity filled," "too many dogfish," "poor quality haul," "did not like the mackerel:herring ratio," etc.), *full slippage* (no fish were kept – i.e., "herring too small," "too many dogfish," "undesired catch," "not enough fish worth pumping," etc.), or *gear damage*. Operational discards are observed and documented to the extent practicable by the observer (as Fish NK or Herring NK – see more information below). Partial and full slippage events are considered to be "unobserved," but observers still collect as much information about the released catch as they can for these events. These events are the focus of the measures proposed in Section 3.2.3.

6.3.2.1 Analysis of Available Slippage Data

This section provides a summary and technical assessment of available information collected by observers at the NEFOP about ***Released Catch/Catch Not Brought on Board***.

Data on slippage events need to be collected in a more consistent manner, and this amendment provides an opportunity to implement the necessary elements of a catch monitoring program to do so. Originally, the Northeast Fisheries Observer Program was not designed to sample high-volume fisheries for species composition and/or collect detailed information about released catch events and net slippage, but this is a need that has arisen in recent years and something that continues to be addressed in the observer sampling protocol, added to observer logs, and addressed through provisions requiring detailed information when slippage events occur. The NEFOP has taken significant steps to improve the collection of this information since before the Council began the development of Amendment 5. Analyses of available slippage data collected by observers over recent years confirms that (1) information about these events and the amount and composition of fish that are slipped has improved; and (2) the number of full/partial slippage events occurring on limited access herring vessels has declined.

6.3.2.1.1 Observer Coverage Levels

Table 145 summarizes coverage rates from the NEFOP for the 2007-2011 calendar years (also the herring fishing years) by gear type for all trips that landed greater than 2,000 pounds of Atlantic herring and updates Table 142 in the Amendment 5 DEIS. Forty six percent (46%) of total herring landings were observed during 2010. During the 2011 fishing year, the Northeast Fisheries Observer Program covered trips for about 55% of all midwater trawl Atlantic herring landings, 45% of pair trawl landings, 25% of purse seine landings, and 13% of bottom trawl 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 145 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2007-2011

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
2007	OTF	397	569	10,518,575	12	15	411,751	3%	3%	4%
2007	OTM	138	451	17,491,210	10	40	1,918,285	7%	9%	11%
2007	PTM	240	849	74,405,385	14	58	6,880,147	6%	7%	9%
2007	PUR	346	743	70,088,194	10	23	2,122,267	3%	3%	3%
2008	OTF	100	234	4,588,190	4	4	70,409	4%	2%	2%
2008	OTM	28	107	8,816,600	16	59	3,163,763	57%	55%	36%
2008	PTM	269	1044	110,453,766	46	176	27,211,668	17%	17%	25%
2008	PUR	232	550	59,211,542	27	64	6,941,134	12%	12%	12%
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

A closer look at observer coverage for the primary gear types in the herring fishery show that coverage rates have been relatively high for the most recent years. Table 146 summarizes observer coverage levels for 2009 by gear type, based on number of trips and number of sea days corresponding with landings from the VTR, Dealer, and IVR databases. **All observed trips for these gear types** (SMW = single midwater trawl, PMW = paired midwater trawl, and PS = purse seine) are included in Table 146 *regardless of target species or pounds of herring landed*. The totals also include trips covered by two or more observers (i.e., pair trawl trips, trips with catcher/carriers). Overall, coverage across the vessels using the primary gear types in the herring fishery was greater than 20% in 2009 and averaged close to 30% based on herring landings. Coverage was even higher in 2010 and 2011.

Table 146 Summary of NEFOP Observer Coverage Levels by Gear Type, 2009

	# trips				# sea days				Metric tons of herring landed
	SMW	**PMW**	**PS**	**Total**	**SMW**	**PMW**	**PS**	**Total**	**Total**
OBS	18	138	53	209	74	473	162	709	28,938
VTR	78	489	222	789	352	1844	591	2787	106,301
Dealer									101,025
IVR									102,617
% coverage	**23%**	**28%**	**24%**	**26%**	**21%**	**26%**	**27%**	**25%**	**27% (VTR)** **29% (Dealer)** **28% (IVR)**

A detailed assessment of observer coverage rates based on limited access herring permit category further confirms that the NEFOP has been covering the vessels managed by the Herring FMP and subject to the Amendment 5 provisions at relatively high levels in recent years. Table 147 summarizes observer coverage by the NEFOP for 2009 and 2010 collectively (combined). The total percent coverage based on the weight of herring landed was 33%; compared to the coverage rates in prior years, coverage for midwater trawls and purse seine vessels has never been as high.

Table 147 Observer Program Coverage Rates for 2009-2010, by Gear and Permit Category

Permit	Gear	Total Trips	Total Days	Trips w/ Herring	Total Herring Landed (000's of pounds)	Obs Trips	Obs Days	Observed Herring Kept (000's of pounds)	% Trips Obs	% Days Obs	% Herring Obs
A	Pair Trawl	882	3,382	683	250,685	329	1,250	96,696	37%	37%	39%
A/B	Single Trawl	123	530	108	33,726	54	211	13,918	44%	40%	41%
A	Purse Seine	398	1,086	362	66,752	101	290	11,794	25%	27%	18%
A	Bottom Trawl	1,020	4,344	118	12,202	119	713	482	12%	16%	4%
B/C	Bottom Trawl	5,278	11,262	409	5,710	465	1,068	356	9%	9%	6%
D	Bottom Trawl	36,511	83,639	657	454	2,609	9,386	25	7%	11%	6%

6.3.2.1.2 2008/2009 Slippage Information

**It is important to note that 2008/2009 slippage information is not directly comparable to 2010 slippage information due to increased observer coverage, changes to observer protocols, and implementation of the observer discard log in 2010. While the 2008/2009 information is useful to generally characterize the nature/extent of slippage in the fishery, it is not a complete record of slippage events observed during these years (unlike 2010); 2010 slippage data has been determined by the Herring PDT to be more complete and more reliable.*

Table 148 provides some information about released catch in the herring fishery based on observed trips during 2008 and 2009 where slippage events occurred and details were provided by the vessel captain/operator. In general, released catch includes operational discards (fish sill in gear after pumping is completed), partial slippage (some fish pumped), full slippage (no fish pumped), and gear damage. Partial/full slippage accounted for about 1.5% of total observed catch in 2008 and 2009 (total observed catch – 120,932,721 pounds). When operational discards were observed during 2008 and 2009, comments indicated fish "were left in net after pumping" or "fell out of gear when pumps were switched." Operational discarding events represent the smallest amounts of released catch (see Figure 76). Partial slippage events included comments like "vessel capacity filled," "too many dogfish," "poor quality haul," "pump jammed by dogfish," and "captain did not like the mackerel:herring ratio." Full slippage events included comments like "herring too small," "too many dogfish," "not enough to be worth pumping," and "undesired catch, thought he set on herring" (Figure 77 and Figure 78).

For the 2008/2009 data, NEFOP staff examined the data by hand to investigate and summarize comments that were provided about slippage events. Sampling protocols in 2008/2009 did not include comprehensive and detailed documentation of slippage events, so there were events for which no comments were provided. The data in Table 148 and Figure 76 – Figure 79, therefore, do not represent all slippage events that were observed, but rather just the events for which additional information was provided by the captain. This is no longer the case, as the NEFOP discard log implemented in 2010, as well as observer re-training for high-volume fisheries sampling, has produced clearer protocols for observers and allowed for detailed information to be collected about all slippage events that are observed in the fishery (see additional 2010 information below).

Table 148 Frequency of Released Catch Events 2008/2009

year	month	# hauls covered	kept lbs observed	# hauls w/ released catch	estimated lbs released
2008	Jan	18	822,447	0	
2008	Feb	13	2,621,846	0	
2008	Mar	17	2,184,187	5	17,000
2008	Apr	7	1,890,207	0	
2008	May	21	4,884,872	1	20,000
2008	Jun	27	2,560,004	2	280
2008	Jul	34	3,712,098	5	250,600
2008	Aug	14	2,626,778	0	
2008	Sep	5	110,020	1	200
2008	Oct	40	6,617,020	6	18,740
2008	Nov	24	5,181,209	2	130
2008	Dec	18	4,794,028	4	25,400
2009	Jan	38	7,432,979	2	10,201
2009	Feb	28	2,782,767	6	175,950
2009	Mar	16	1,958,569	2	226,000
2009	Apr	17	3,585,031	3	300
2009	May	33	3,711,450	10	107,675
2009	Jun	35	2,339,028	22	28,595
2009	Jul	43	5,773,521	23	181,580
2009	Aug	36	3,040,099	15	81,650
2009	Sep	85	17,204,553	27	402,117
2009	Oct	64	10,046,838	20	214,400
2009	Nov	67	11,730,652	34	938,215
2009	Dec	11	131,920	2	6,025

Figure 76, Figure 77, and Figure 78 summarize the comments that NEFOP observers received from vessel captains regarding released catch events in 2008 and 2009. During these years, the estimates of the amount of released catch were most often provided by the captains. These figures only summarize events for which comments were provided by the captain; providing these details is voluntary, and while cooperation between the industry and observers has always been good, additional details were not required, and observers did not ask as many questions about the released catch until the implementation of the discard log in 2010. Based on comments received for some of the events that occurred in 2008 and 2009, operational discards and gear damage accounted for 55% of the released catch events, but represented a much smaller fraction of the total estimated weight of released catch (less than 6%). The estimated weight of partial slippage events (events for which captains provided an estimate) in 2008/2009 averaged 45,175 pounds, and the estimated weight of full slippage events (when comments were provided) averaged 27,581 pounds (Figure 76 and Figure 77).

Figure 76 Analysis of Comments Regarding Released Catch 2008/2009

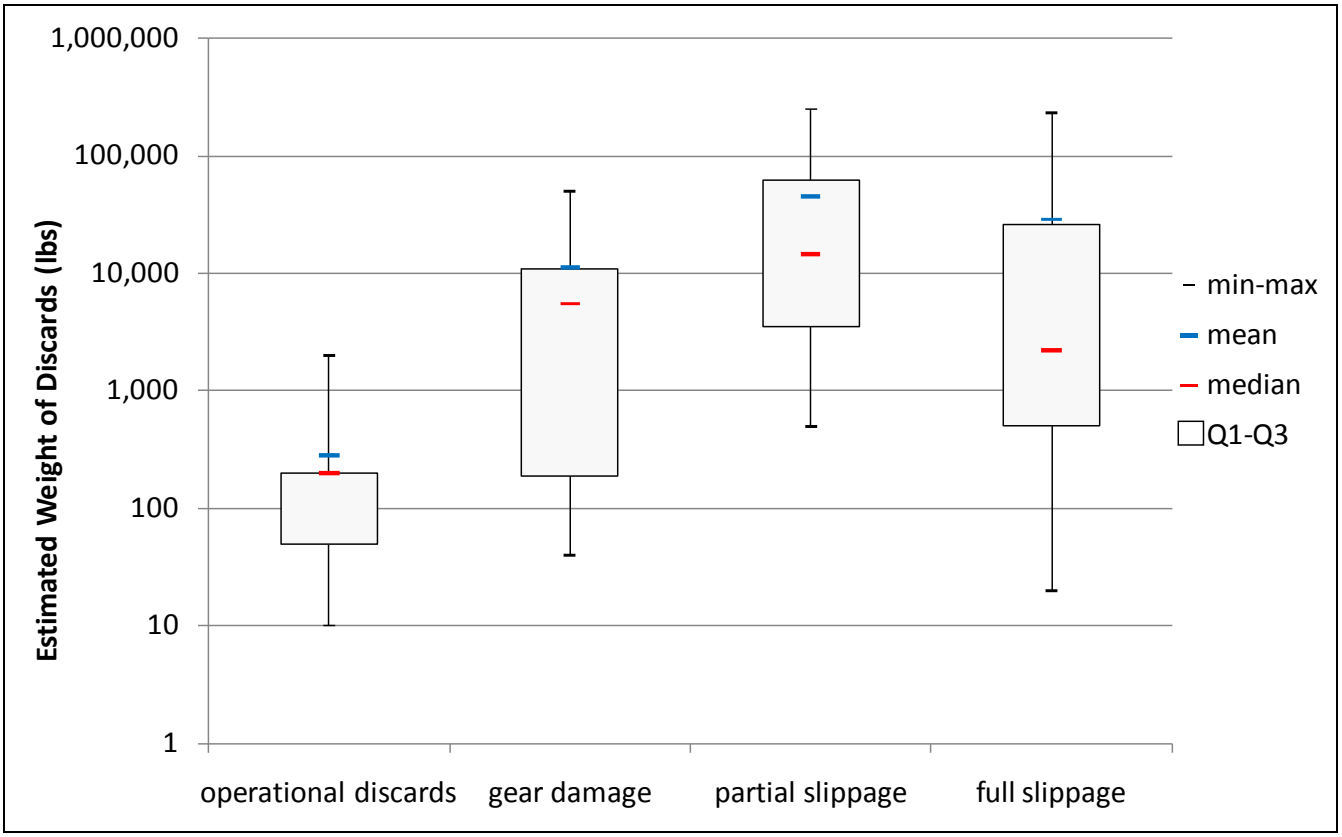


Figure 77 Analysis of Comments Regarding Released Catch 2008/2009 (continued)

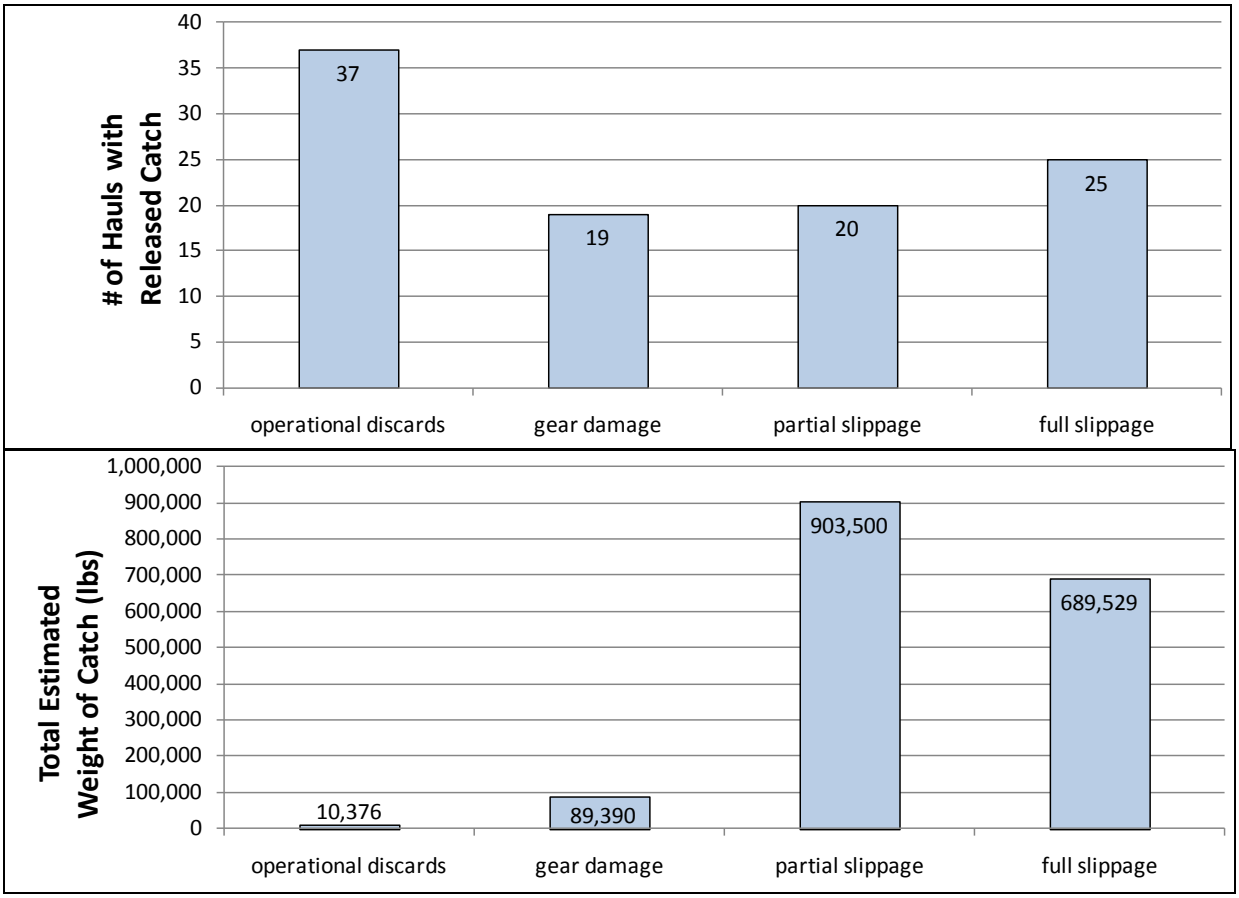
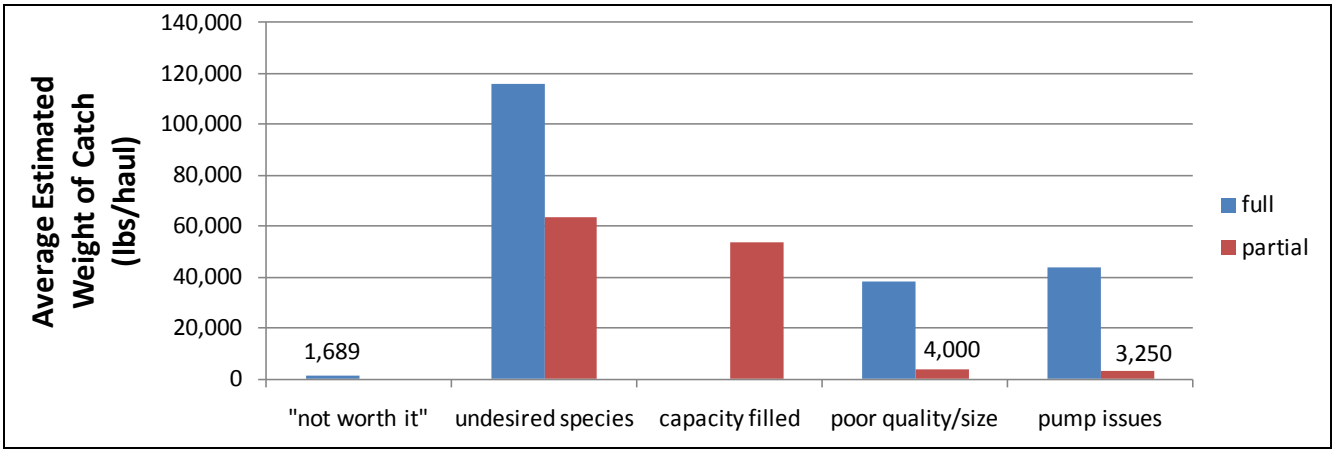


Figure 78 Information About Full and Partial Slippage Events 2008/2009



Slippage information collected by observers in 2008 and 2009 was also examined to identify similarities/differences between events occurring on vessels using different gear types (Figure 79). The information provided in 2008 and 2009 suggests that purse seine vessels may experience more released catch events as a result of operational discards and/or gear damage than midwater trawl vessels. Purse seine vessels fish almost exclusively in the inshore Gulf of Maine (Area 1A), and the nature of the gear and the operation of the fishery may result in more instances of operational discards and/or gear damage. This is an important consideration relative to management measures that would require purse seine vessels to bring all fish across the deck for sampling, including operational discards (i.e., recently-revised Closed Area I sampling provisions).

However, as indicated in Figure 79 and previously discussed, comments were not provided for all released catch events, and information about these events is incomplete. The implementation of the discard log in 2010, along with increased cooperation from the industry and a desire by everyone to obtain better information about released catch, has improved sampling, reduced the amount of released catch that could not be observed, and improved the quality of information collected about these events (see 2010 information below).

Figure 79 Analysis of Comments Regarding Released Catch 2008/2009 by Gear Type

	# of Hauls with Comments				
	Operational Discards	Gear Damage	Full Slippage	Partial Slippage	# of Hauls Observed
Bottom Trawl			2		63
Purse Seine	21	13	11	4	205
Paired Midwater Trawl	14	5	9	15	558
Single Midwater Trawl	2	1	2	1	83

Post-Pumping Questions

	# Hauls w/ fish left in net	# Hauls w/o fish left in net	# Hauls could not see	% of Hauls w/ Responses
Purse Seine	75	82	14	83%
Paired Midwater Trawl	129	92	125	62%
Single Midwater Trawl	6	41	7	65%

6.3.2.1.3 2010 Slippage Information

The NEFOP recently updated its observer training program to address new requirements for herring vessel access to Closed Area I as well as general training for observing high volume fisheries. In 2010, the NEFOP conducted three high-volume fishery training classes to recertify 70 observers. The program was designed to improve sampling in fisheries that pump fish on board and ensure that only experienced observers who have proven high data quality will be assigned to these fisheries. The program was developed to improve fishery-specific training and focuses on defining gear, understanding bycatch issues, knowing and identifying species of concern, subsampling methodology, common scenarios, safety, and the process of pumping fish on board.

The NEFOP also implemented a discard log in 2010 to obtain more detailed information regarding discards in high-volume fisheries. The new discard log is being completed for every haul, and it includes fields to provide information on what kind of discard event may have occurred, whether or not the observer could see the contents of the codend when pumping stopped, why catch may have been discarded, information about the composition of discarded catch, and any challenges the observer may have experienced when observing the haul. Observers are also documenting released catch (including operational discards and slippage events) with photographs whenever possible, and bringing in samples of fish from every trip to confirm species identification.

Between increased observer coverage levels, an increase in information being provided by the fishermen and crew, and the new observer discard log implemented in 2010, data collected by observers regarding released catch events on limited access herring vessels during the 2010 fishing year provides much more detail about catch not brought on board herring vessels, and overall, the information collected about slippage has improved considerably. Operational discards have been confirmed by observers to be relatively small amounts of fish that may remain in the net following a successful haul/pump; these fish are usually caught in the net and/or cannot be pumped on board. Information collected by observers about operational discards has improved, and hauls with operational discards are considered to be "observed" hauls; the operational discards are estimated by the observers and represent "small" amounts of fish. Any partial or full released catch ("slippage" as defined in Amendment 5) is considered unobserved, but observers still collect as much information as possible about these discards.

In 2010, observer coverage for the midwater trawl fleet was close to 30% fishery-wide and was even higher on Georges Bank (85% coverage by weight of fish landed). Overall, observers provided data for 929 hauls on limited access herring vessels during the 2010 fishing year. The new discard log allows observers to provide more information about reasons for not bringing fish on board, including who estimated the released catch, additional details regarding why the catch was released, and whether the discards were observed on the deck or in the water.

Table 149 provides data for the 332 observer records (287 unique hauls) in 2010 that included fish not brought on board. About 290 of these hauls were documented with "not enough fish to pump," i.e., operational discards. Observers document operational discards as *Herring NK* if they are able to see the fish that are not pumped and confirm that the discards are all herring-bodied fish. Otherwise, the discards are documented as *Fish NK* (see below for more information about the evolution of the Herring NK and Fish NK categories). The total weight of fish not brought on board estimated by observers in 2010 was about 460,000 pounds; this includes operational discards, which, although more frequent, generally represent very small amounts of fish. Total herring landings for this fleet in 2010 were about 58 million pounds.

A preliminary review of the observer data indicate that in 2010, only 35 records (approximately 30 unique hauls) of 929 hauls (3.2%) that were observed on limited access herring vessels were documented to have experienced full or partial slippage events. The total estimated catch not brought on board compared to the total observed catch on these vessels in 2010 was about 0.7% (this does not include fish that were brought on board and then discarded). In addition, there were 99 hauls observed in Closed Area I during 2010, under the new provisions for sampling catch, implemented in November 2009. There were no slippage events observed in these 99 hauls, and consequently no Released Catch Affidavits were submitted from the Closed Area I fishery in 2010. There appears to have been one released catch event (estimated 1,500 pounds) on a haul that ended (but did not begin) in Closed Area I. However, the recently-implemented revisions to the Closed Area I rules (January 2011) require that all operational discards be brought on board; potential logistical and sampling issues associated with this new requirement are unclear because fishing effort has not yet moved into Closed Area I this year.

Table 149 Summary of 2010 Observed Events on Limited Access Herring Vessels (by Number and Estimated Weight of Fish in Lbs.) with Fish Not Brought on Board

	species	"reason not specified"	"gear damage"	"fell out of gear"	"no market value"	"vessel capacity filled"	"not enough fish to pump"
Number of hauls with occurrence	butterfish	1					1
	haddock						6
	herring nk			3		1	105
	atl herring	1				1	18
	mackerel	1				1	4
	redfish						7
	spiny dogfish						1
	striped bass			1			1
	whiting	1					4
	fish nk	10	5	3	2	3	138
	hake nk						6
	lobster						1
	Loligo	1					1
	Illex						2
	eel nk						2
Estimated weight (lbs)	butterfish	5					1
	haddock						72
	herring nk			410		3,000	20,622
	atl herring	100				175	6,425
	mackerel	50				175	155
	redfish						38
	spiny dogfish						25
	striped bass			12			10
	whiting	10					372
	fish nk	169,450	108,000	4,700	44,000	20,050	72,766
	hake nk						215
	lobster						10
	Loligo	3					10
	Illex						13
	eel nk						8,150

Figure 80 Observed Events on Limited Access Herring Vessels (by Number of Hauls) with Fish Not Brought on Board in 2010

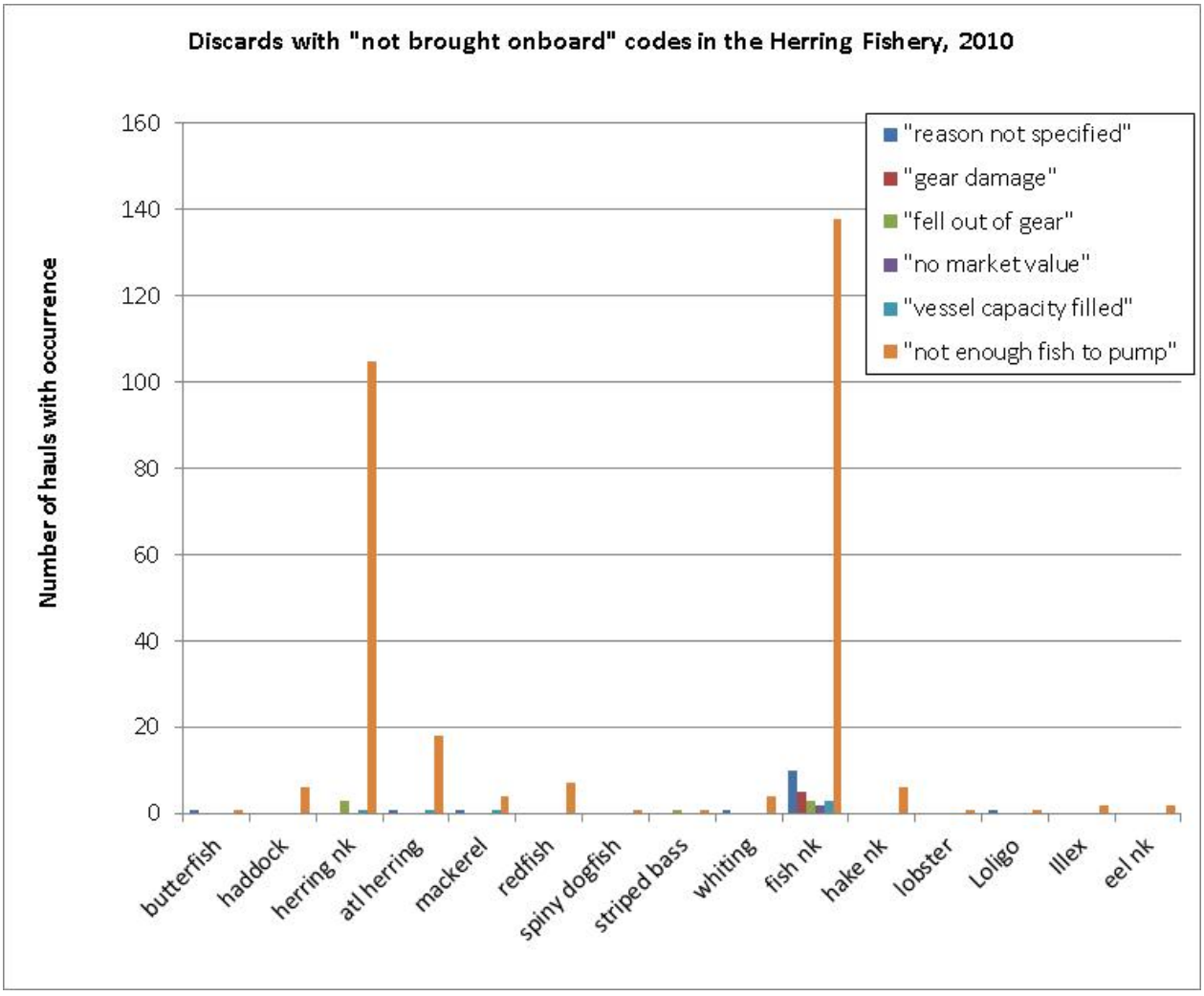


Figure 81 Observed Events on Limited Access Herring Vessels (by Estimated Weight of Fish in Pounds) with Fish Not Brought on Board in 2010

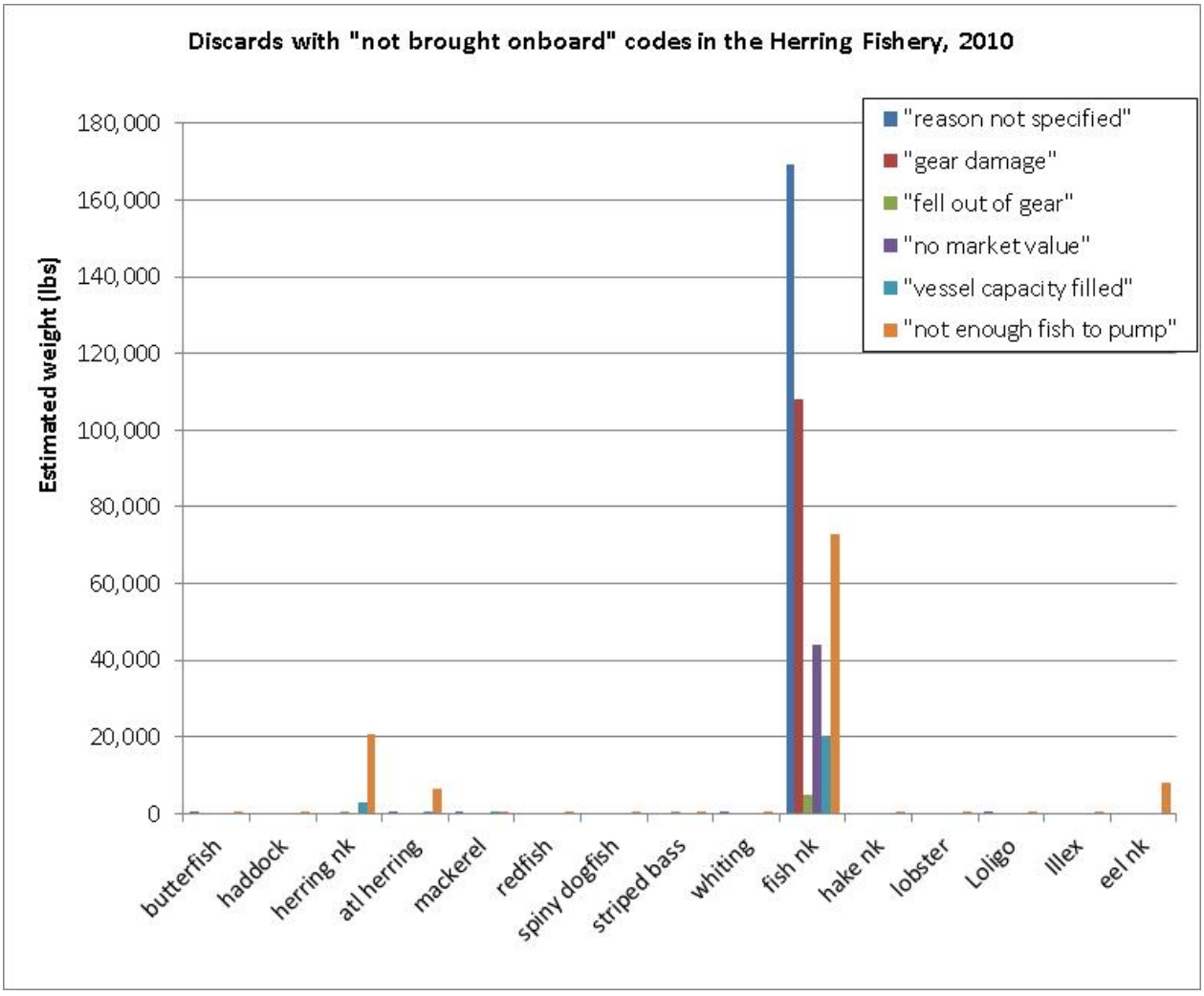


Figure 82 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Number of Hauls) in 2010

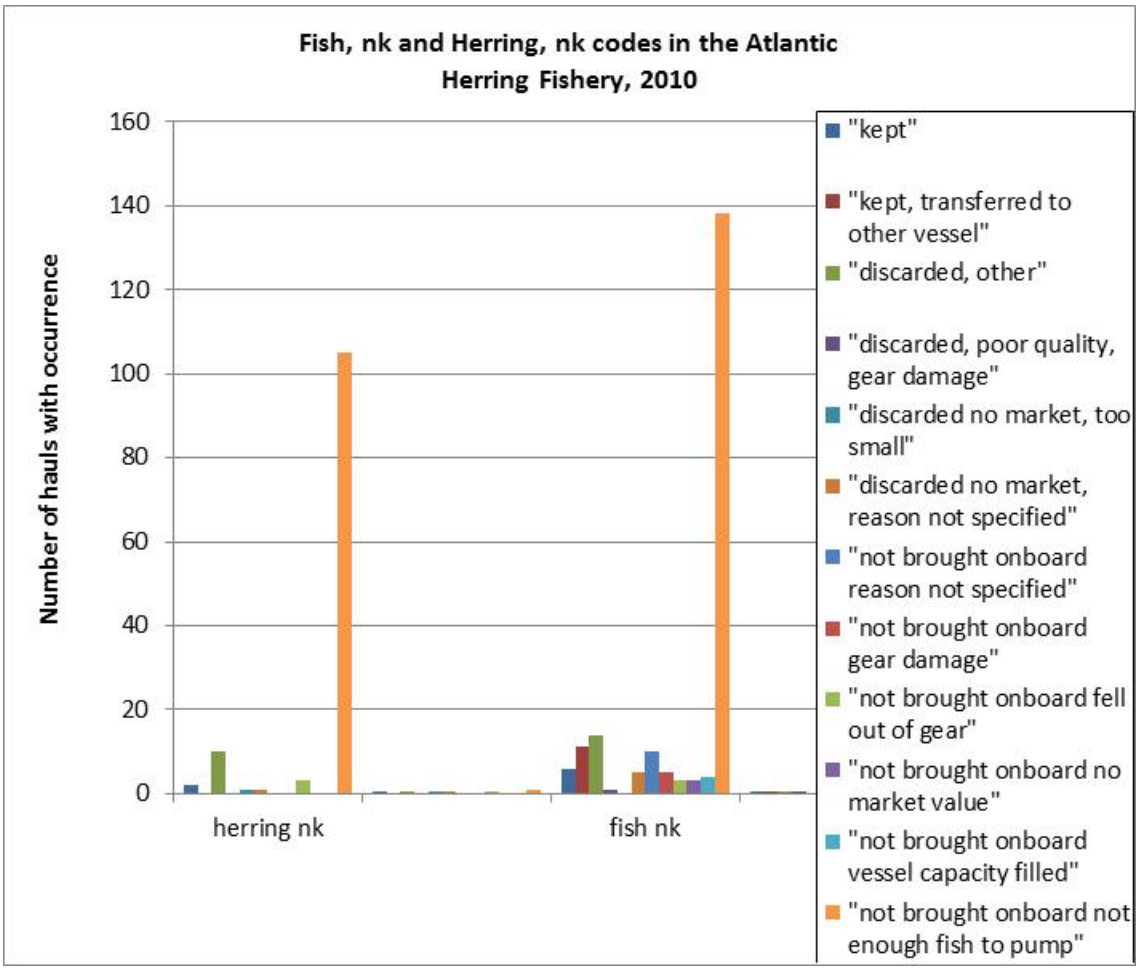
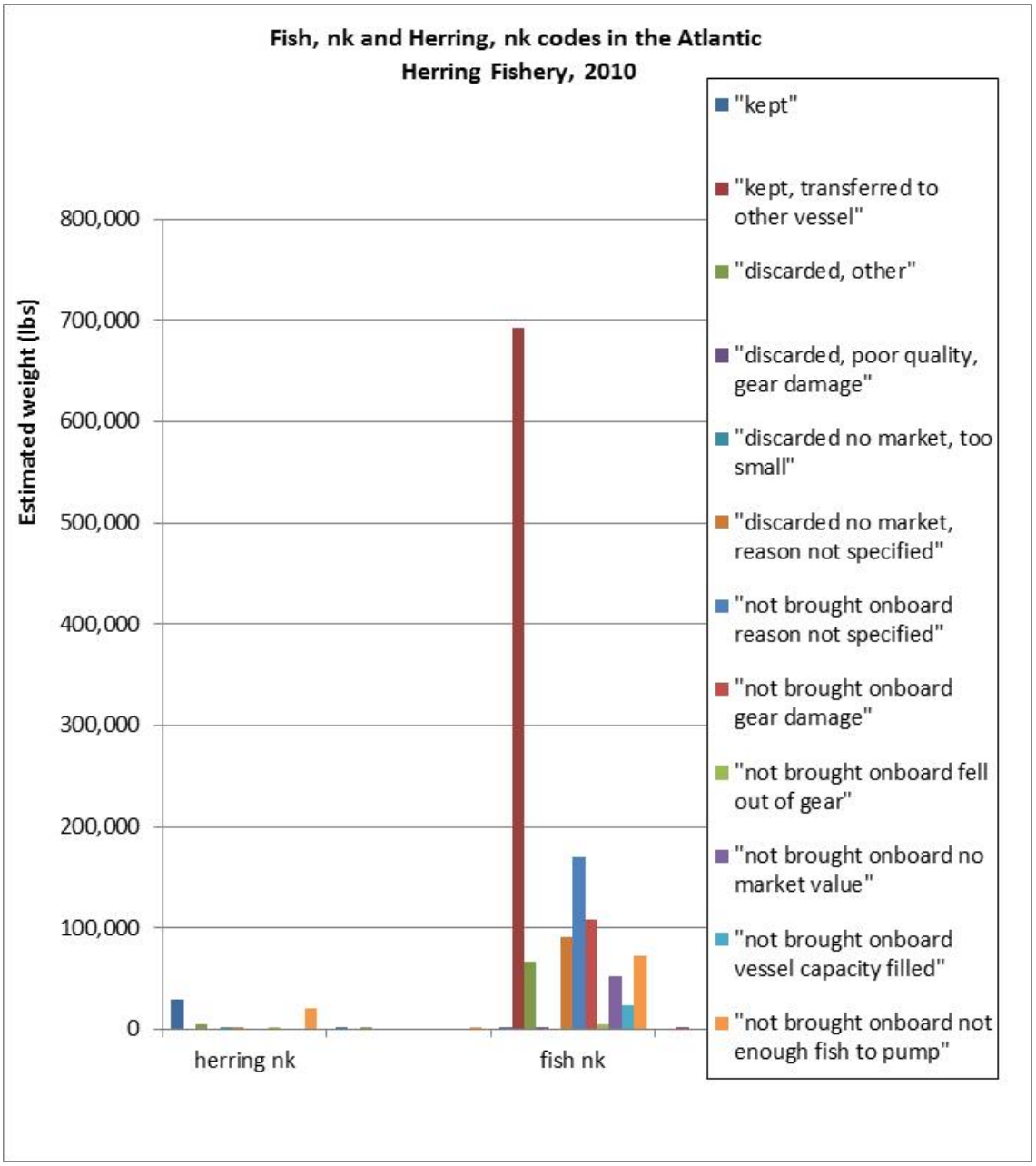
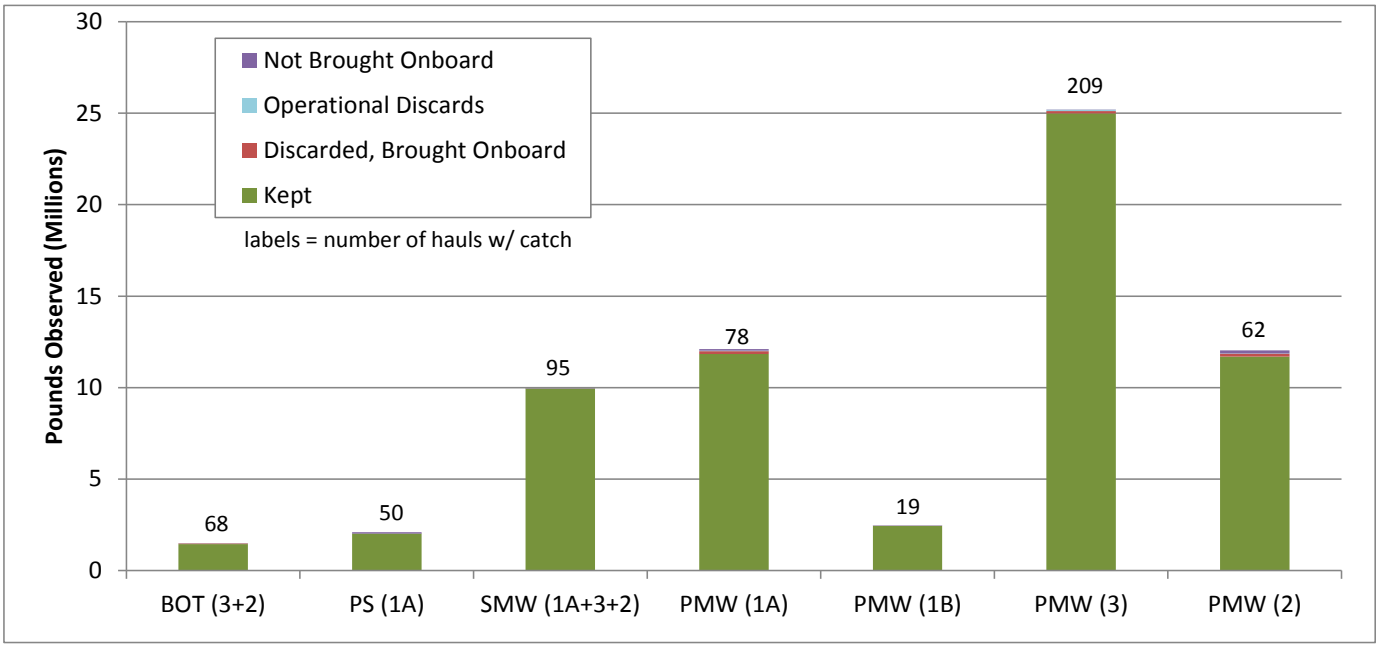


Figure 83 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Estimated Weight) in 2010



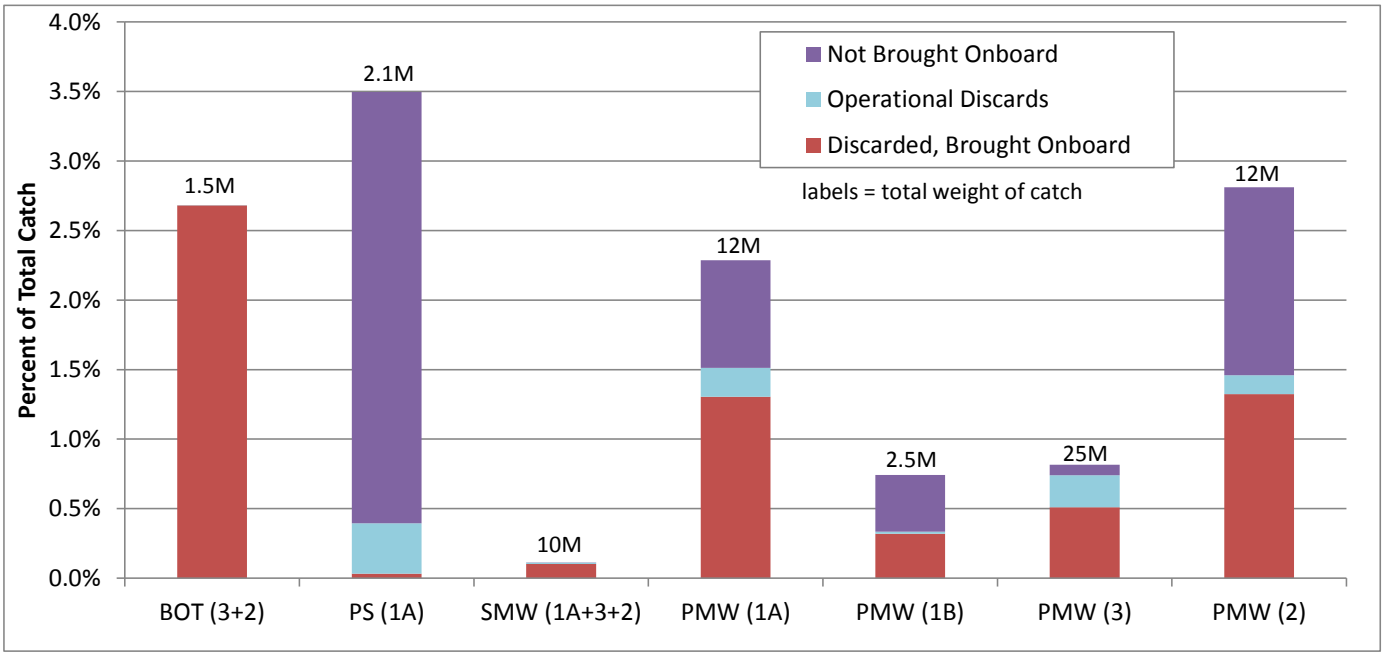
Available information suggests that the amount of fish estimated to be slipped in full/partial slippage events is less than 100,000 pounds. Information provided by vessel captains in 2008/2009, although incomplete, indicates that the estimated weight of partial slippage events (events for which captains provided an estimate) in averaged 45,175 pounds, and the estimated weight of full slippage events (when comments were provided) averaged 27,581 pounds (Figure 76 and Figure 77). Information about slippage events and details about the released catch improved considerably in 2010 with the establishment of the new discard log. In addition, the observed number of slippage events declined in 2010. Figure 84 and Figure 85 characterize discards observed in 2010 and provide some perspective on slippage events by gear type and management area. Because few slippage events were observed in 2010 (with a relatively high level of observer coverage across the fishery), disaggregating the data is more difficult due to confidentiality restrictions. However the information in Figure 84 and Figure 85 show that discards at-sea, in total, represent a very small fraction of catch on herring vessels; catch not brought on board represented the highest fractions of total catch for purse seine and pair trawl vessels fishing in Areas 1 and 2 (purse seine vessels only fish in Area 1).

Figure 84 Summary of 2010 Observed Catch (Pounds) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition



BOT – Bottom Otter Trawl; PS – Purse Seine; SMW – Single Midwater Trawl; PMW – Paired Midwater Trawl

Figure 85 Summary of 2010 Observed Discards (as Percent of Total Observed Catch) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition



BOT – Bottom Otter Trawl; PS – Purse Seine; SMW – Single Midwater Trawl; PMW – Paired Midwater Trawl

6.3.2.1.4 2011 Slippage Information

This updated information is provided by the Herring PDT for the Final EIS for Amendment 5.

Table 150, Figure 86, and Figure 87 summarize data for the observer records (1140 unique hauls) in 2011 on limited access declared herring trips that included fish "Not Brought On Board." About 198 of these hauls (17.4%) were documented with "not enough fish to pump," i.e., *operational discards*. Observers document operational discards as *Herring NK* if they are able to see the fish that are not pumped and confirm that the discards are all herring-bodied fish. Otherwise, the discards are documented as *Fish NK*. Data were pulled similar to the 2010 released catch/slippage data provided in this section (see previous tables/figures).

The total weight of fish not brought on board estimated by observers in 2011 was 1,041,211 pounds; this includes operational discards, which, although more frequent, generally represent very small amounts of fish.

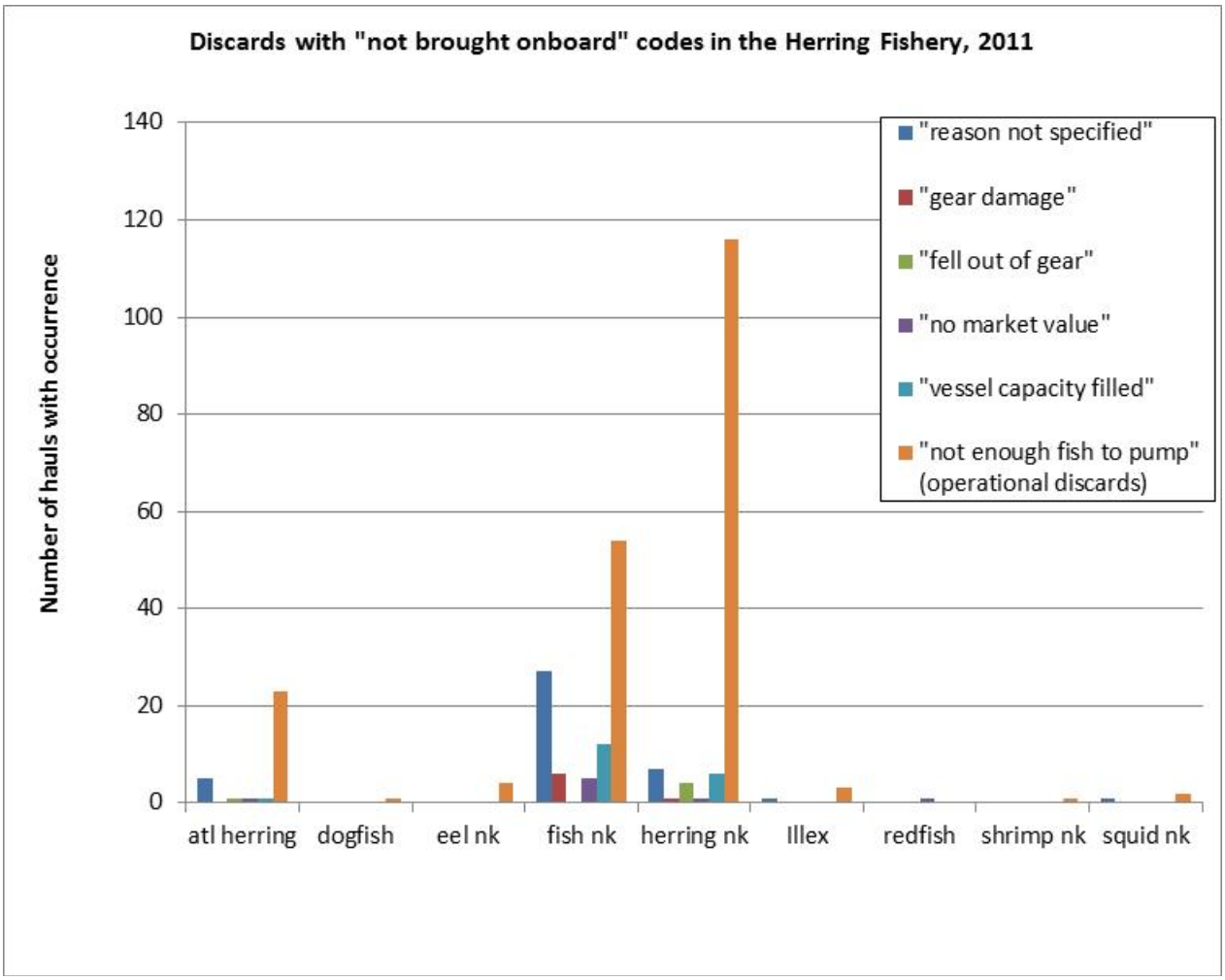
A review of the observer data indicate that in 2011, 78 out of 1,140 hauls (6.8%) observed on limited access declared herring trips experienced full or partial slippage events (catch not brought on board, not including operational discards). The ratio of total estimated catch not brought on board compared to the total observed catch on these vessels in 2011 was about 1.4% (this does not include fish that were brought on board and then discarded). By gear type, this ratio translates to 0.16% for bottom otter trawl (all areas), 5.31% for purse seine (Area 1A), 2.19% single midwater trawl (all areas), 0.11% pair trawl (Area 1A), 0.53% pair trawl (Area 3), and 0.48% pair trawl (Area 2). Additional information about slippage by gear type and management area is provided in this analysis to support the Council's ***Preferred Alternative*** for Management Measures to Address Net Slippage in Amendment 5.

Table 150 Summary of 2011 Observed Events on Limited Access Herring Vessels – Declared Herring Trips (by Number and Estimated Weight of Fish in lbs.) with *"Fish Not Brought on Board"* Codes

	species	"reason not specified"	"gear damage"	"fell out of gear"	"no market value"	"vessel capacity filled"	"not enough fish to pump" (operational discards)
Number of hauls with occurrence	atl herring	5	0	1	1	1	23
	dogfish	0	0	0	0	0	1
	eel nk	0	0	0	0	0	4
	fish nk	27	6	0	5	12	54
	herring nk	7	1	4	1	6	116
	Illex	1	0	0	0	0	3
	redfish	0	0	0	1	0	0
	shrimp nk	0	0	0	0	0	1
	squid nk	1	0	0	0	0	2
Estimated weight (lbs)	atl herring	2,754	0	10	10,000	500	1,947
	dogfish	0	0	0	0	0	80
	eel nk	0	0	0	0	0	860
	fish nk	339,170	394,000	0	68,400	108,500	11,398
	herring nk	43,700	300	170	10,000	32,700	16,248
	Illex	3	0	0	0	0	30
	redfish	0	0	0	400	0	0
	shrimp nk	0	0	0	0	0	1
	squid nk	10	0	0	0	0	30

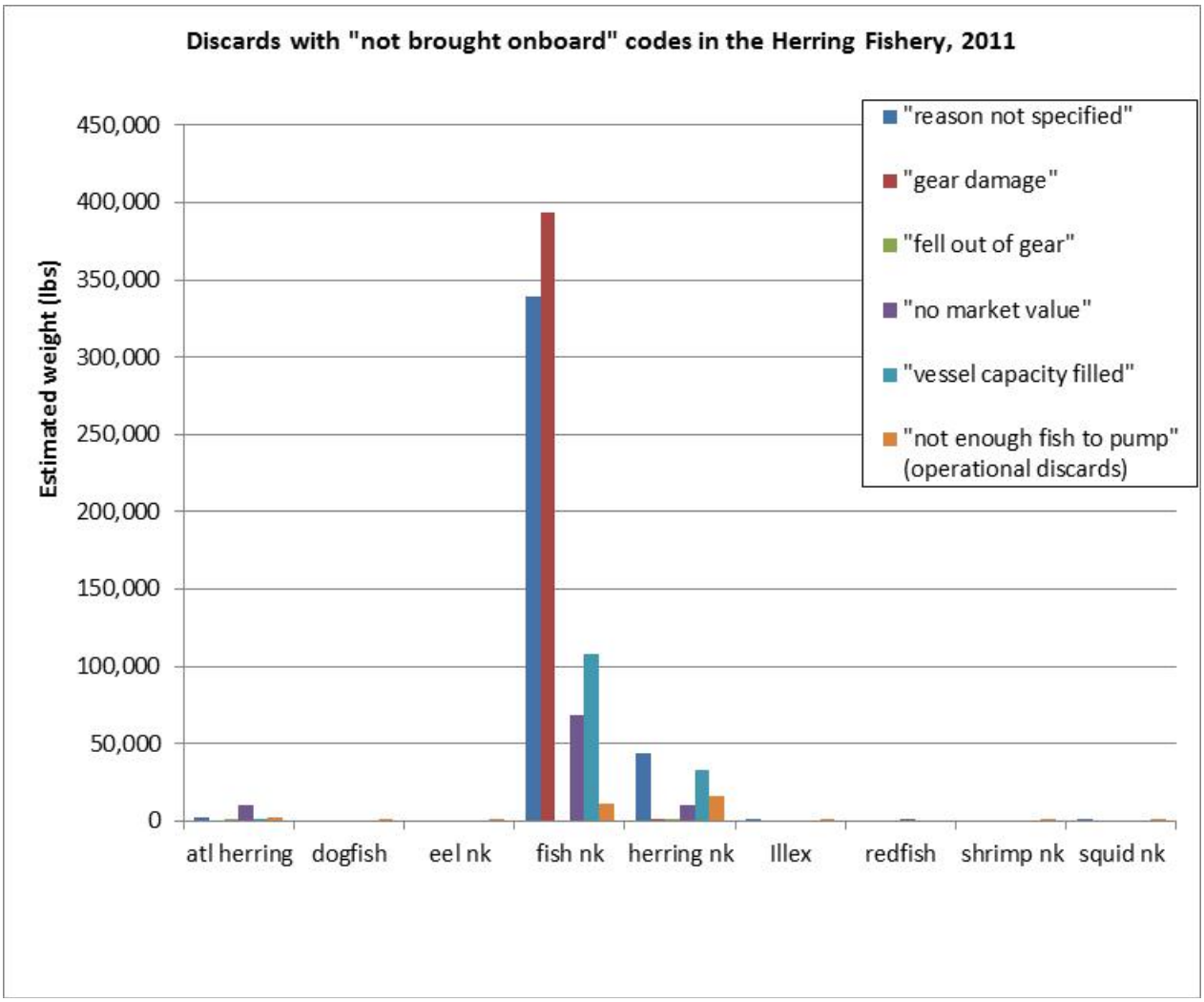
Note: Information in all columns except for the far right ("not enough fish to pump" (operational discards)) represents partial/full slippage events.

Figure 86 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (by Species and Number of Hauls)



Note: All columns except for "'not enough fish to pump' (operational discards)" represent partial/full slippage events.

Figure 87 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (By Species and Estimated Weight of Fish in Pounds)



Note: All columns except for "'not enough fish to pump' (operational discards)" represent partial/full slippage events.

There was almost no mackerel fishery in 2011, but in 2010 there were eight (8) observed mackerel trips (50% mackerel or over 100,000 pounds mackerel) that caught about 5.5 million pounds of fish (about 2 million pounds of mackerel and 3.3 million pound of herring) and had about 12,000 pounds of unobserved fish ("not brought on board"), some of which was specified by species but mostly consisted of "*Fish, NK*."

Table 151, Table 152, Figure 88, and Figure 89 provide 2011 observer data by gear type and management area, including observed hauls with catch "Not Brought on Board," i.e., full or partial slippage events (shaded rows in the following tables). Based on the ratio of slipped catch to total catch, purse seine vessels fishing in Area 1A had the highest observed slippage rates in the fishery during the 2011 fishing year. Observers documented full or partial slippage events on almost 30% of observed purse seine hauls in Area 1A during 2011. Coverage was low on purse seine vessels relative to other gear types in the fishery; the proposed trip termination threshold of ten slippage events per gear type and management area,

therefore, may constrain purse seine activity in Area 1A and may impact purse seine operations, especially if observer coverage is increased to 100% for Category A and B vessels.

Single midwater trawl vessels were not observed to have many slippage events in 2011; only four slippage events were observed on single midwater trawl vessels across all management areas. However, when grouped with pair trawls as proposed in the measures to address slippage (Section 3.2.3.4), the single midwater trawl sector may be likely to encounter trip terminations in Areas 2 and 3, particularly with 100% observer coverage on Category A and B herring vessels. Pair trawl vessels were observed to have 8 slippage events in Area 2 and 19 in Area 3 during 2011, with about 30% observer coverage across the fishery (although closer to 80% in Area 3). Single midwater trawl vessels, however, accounted for the largest slippage events, averaging about 50,000 pounds per observed event. Purse seine vessels averaged 15,190 pounds per observed slippage event, and pair trawl vessels in Area 3 averaged about 9,000 pounds per event.

Table 151 Summary of NEFOP 2011 Released Catch Data from Limited Access Vessels on Declared Herring Trips (Number of Hauls by Gear and Area)

	Bottom Trawl (All Areas)	**Purse Seine (Area 1A)**	**Single MWT (All Areas)**	**Paired MWT (Area 1A)**	**Paired MWT (Area 3)**	**Paired MWT (Area 2)**
# of Hauls (# w/catch)	**366 (349)**	**133 (127)**	**51 (51)**	**65 (34)**	**313 (172)**	**122 (64)**
Hauls w/ Kept	346	104	51	31	158	57
Hauls w/ Discards, after brought onboard	319	107	34	30	141	62
Hauls w/ Operational Discards	0	71	0	9	75	43
Hauls w/ "Not Brought Onboard"	6	37	4	4	19	8
	Bottom Trawl (All Areas)	**Purse Seine (Area 1A)**	**Single MWT (All Areas)**	**Paired MWT (Area 1A)**	**Paired MWT (Area 3)**	**Paired MWT (Area 2)**
# of Hauls (# w/ catch)	**366 (349)**	**133 (127)**	**51 (51)**	**65 (34)**	**313 (172)**	**122 (64)**
Hauls w/ Kept	95%	78%	100%	48%	50%	100
Hauls w/ Discards, after brought onboard	87%	80%	67%	46%	45%	109
Hauls w/ Operational Discards	0%	53%	0%	14%	24%	75%
Hauls w/ "Not Brought Onboard"	2%	28%	8%	6%	6%	14%

Table 152 Summary of NEFOP 2011 Released Catch Data from Limited Access Vessels on Declared Herring Trips (Number of Pounds by Gear and Area)

	Bottom Trawl (All Areas)	Purse Seine (Area 1A)	Single MWT (All Areas)	Paired MWT (Area 1A)	Paired MWT (Area 3)	Paired MWT (Area 2)
Pounds Kept	**2,413,052**	**9,443,700**	**8,809,458**	**7,608,577**	**32,329,166**	**12,717,103**
Pounds Discarded, On-Board	136,668	575,877	212,143	23,093	258,726	78,354
Pounds Operational Discards	0	8,549	0	1,460	15,973	4,612
Pounds "Not Brought On-Board"	4,140	562,037	202,000	8,200	172,740	61,500
	Bottom Trawl (All Areas)	**Purse Seine (Area 1A)**	**Single MWT (All Areas)**	**Paired MWT (Area 1A)**	**Paired MWT (Area 3)**	**Paired MWT (Area 2)**
Total Pounds Observed	**2.55M**	**10.59M**	**9.22M**	**7.64M**	**32.78M**	**12.86M**
% Discarded, On-Board	5.35%	5.44%	2.30%	0.30%	0.79%	0.61%
% Operational Discards	0	0.08%	0	0.02%	0.05%	0.04%
% "Not Brought On-Board"	0.16%	5.31%	2.19%	0.11%	0.53%	0.48%

Figure 88 Summary of 2011 Observed Catch (Pounds) on Limited Access Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition

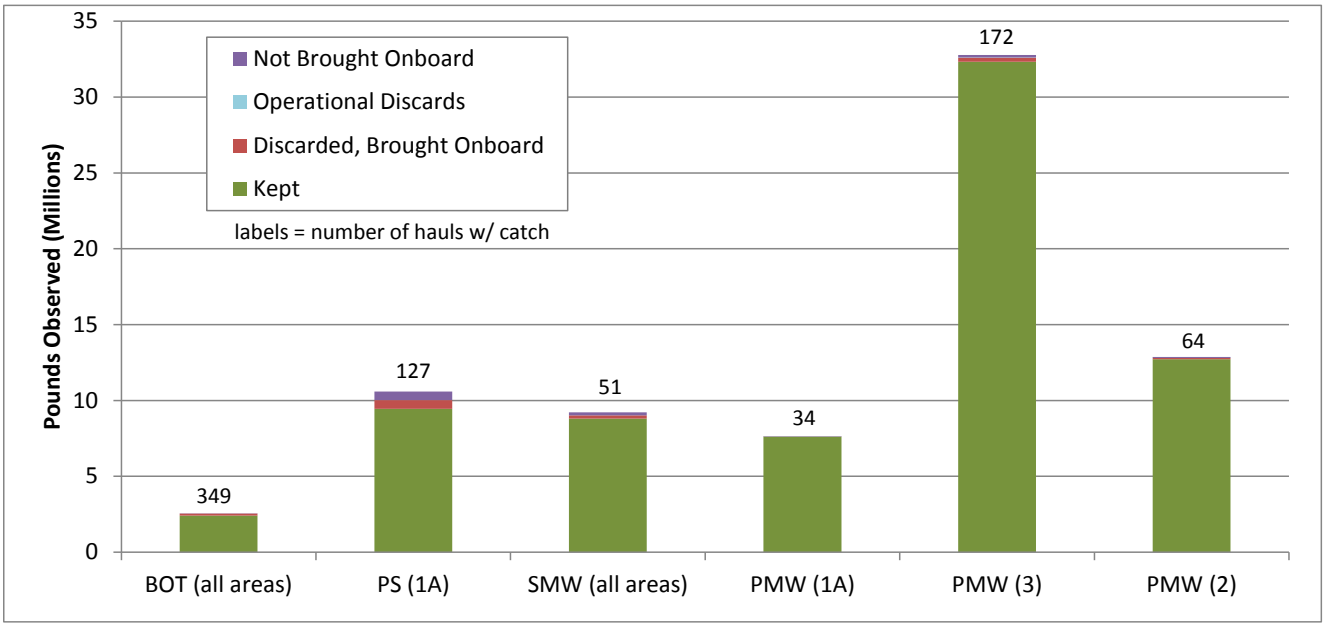
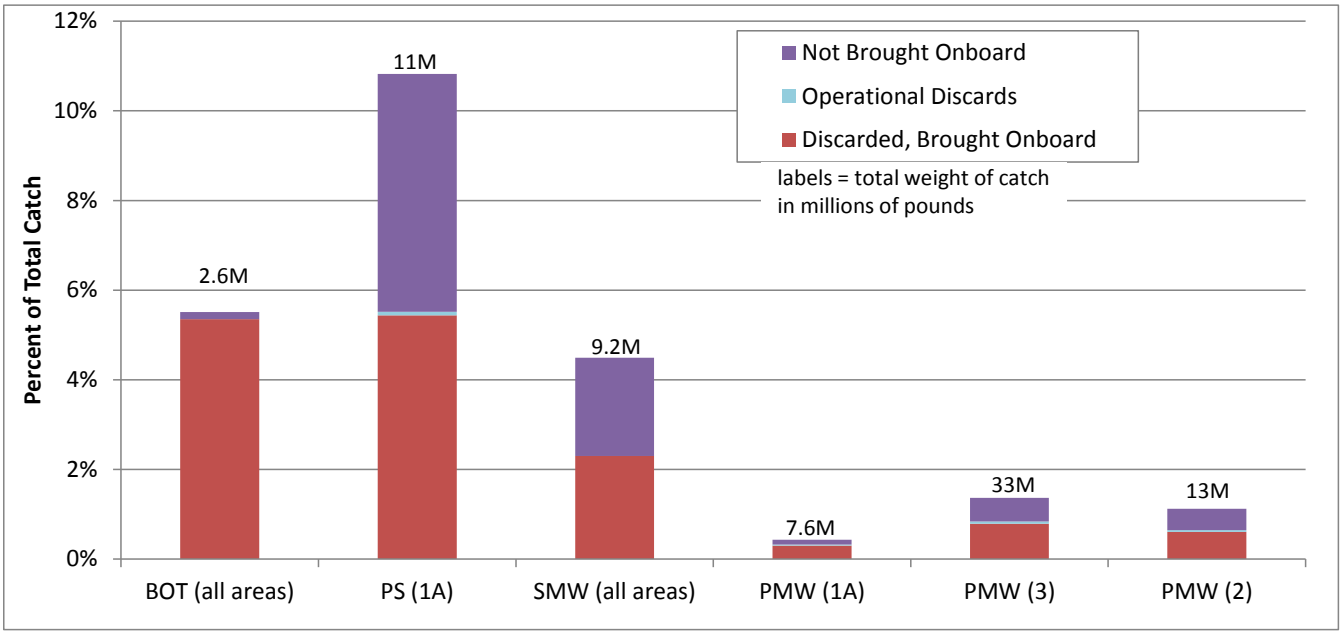


Figure 89 Summary of 2011 Observed Discards (as Percent of Total Observed Catch) on Limited Access Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition



6.3.2.1.5 Use of "Herring NK" and "Fish NK"

It is important to understand the use of the Fish NK and Herring NK categories in the observer data and the ongoing effort by the NEFOP to reduce these categories and better document all fish either kept, discarded, transferred, or not brought on board in the limited access herring fishery. In 2009, the NEFOP transitioned to the use of Fish NK to represent the component of the catch for which observers could not verify identification. This includes partial and fully released tows and operational discards. Prior to 2009, Fish NK, or Herring NK, or Atlantic herring were used to describe this component of the catch, depending upon observer determinations based on their own visual inspection and/or captain and crew input.

In 2009, the NEFOP also transitioned to the use of Fish NK to *represent the composition of the catch pumped to the paired vessel when an observer is not present on the boat taking on the fish*. Prior to 2009, Atlantic herring, or Herring NK, or Fish NK were used to represent this component of the catch, based on the observers assumption that partial catches being pumped to the vessel they were deployed on, were made up of the similar species composition of that being pumped to the alternate vessel. Now, all fish that are retained but not observed in a multi-vessel operation are documented as Fish NK. This component represents the majority of Fish NK records. Using the most recent data as an example (Table 153 and Table 154), the majority of Fish NK records in 2010 (54% by weight) and 2011 (67% by weight) are associated with fish that were pumped to the paired vessel without an observer present to subsample. These fish were landed, sold, and documented through the dealer and VTR data (along with IVR at the time), and the landings may have been sampled through a State portside sampling program.

In 2010, the NEFOP conducted three high-volume fishery training classes to recertify 70 observers. The program was designed to improve sampling in fisheries that pump fish on board and ensure that only experienced observers who have proven high data quality will be assigned to these fisheries. The program was developed to improve fishery-specific training and focuses on defining gear, understanding bycatch issues, knowing and identifying species of concern, subsampling methodology, common scenarios, safety, and the process of pumping fish on board. The NEFOP also implemented a discard log to obtain more detailed information regarding discards in high-volume fisheries. The discard log is completed for every haul during which fish are pumped, and it includes fields to provide information on what kind of discard event may have occurred, whether or not the observer could see the contents of the codend when pumping stopped, why catch may have been discarded, information about the composition of discarded catch, and any challenges the observer may have experienced when observing the haul. Observers are also bringing in samples of fish from every trip to confirm species identification. These efforts have improved sea sampling in the herring fishery and increased the amount and quality of information available to characterize and better document bycatch on vessels that pump fish.

Table 153 and Table 154 provide detailed information regarding all observed Herring NK and Fish NK events (hauls) on limited access herring vessels in 2010 and 2011 respectively, including catch disposition and reasons provided for discarding. "Kept" fish are retained; "discarded" fish represent bycatch (discards) after the catch is brought on board; "not brought on board" represents full/partial slippage events and observations of operational discards; the far right column in each of the tables "not brought on board, not enough fish to pump" represents operational discards.

Herring NK was documented on 122 hauls and Fish NK was documented on 200 hauls in 2010; Herring NK was documented on 191 hauls and Fish NK was documented on 161 hauls in 2011. The majority of Herring NK observations (86%) was due to "not enough fish to pump" (operational discards). Sixty nine percent (69%) of Fish NK observations was associated with operational discards. In general, the amounts of fish classified in these categories per haul are relatively small. There was one sampling event in 2010 that documented 30,000 pounds of Herring NK "kept," which represents almost half of all Herring NK observed in 2010 (Table 153, Figure 82, Figure 83). In this one event, the observer was able to see the fish as they came on board, and during the pumping process, the observer could confirm that the fish were all herring-bodied fish but could not obtain basket samples for safety reasons. As noted above, about ½ of observed Fish NK and Herring NK in 2010 was landed, and even more was landed in 2011; in these cases, portside sampling is beneficial to confirm the species composition of the landings.

The remaining Fish NK records are mostly associated with fish that were discarded and the reason was not specified, fish that were discarded due to gear damage and operational discards. Operational discards that the observer is able to visually inspect and therefore term Herring NK instead of Fish NK, represent 36% of the herring NK records by weight in 2010 and 14% by weight in 2011. Nine percent (9%) of the Herring NK records in 2010 are associated with fish that mainly fell from the chute, were seen by the observer and therefore identified as herring, then washed overboard.

Species identification issues also result in the use of Fish NK or Herring NK. In these cases, an observer has sent in a whole fish sample, which is identified by experienced staff at the NEFOP. If the observer has mis-identified the species the use of Fish NK or Herring NK may be used. In 2010, there was one record changed to Herring NK due to mis-identification of the species.

Table 153 Quantification of Fish NK and Herring NK (in Pounds) on Observed Hauls by Limited Access Herring Vessels in 2010

	species group	"kept"	"kept, transferred to other vessel"	"discarded, other"	"discarded, poor quality, gear damage"	"discarded no market, too small"	"discarded no market, reason not specified"	"not brought onboard reason not specified"	"not brought onboard gear damage"	"not brought onboard fell out of gear"	"not brought onboard no market value"	"not brought onboard vessel capacity filled"	"not brought onboard not enough fish to pump"	TOTALS
Number of hauls with occurrence	herring nk	2	0	10	0	1	1	0	0	3	0	0	105	**122**
		1.6%	0 %	8.2%	0%	0.8%	0.8%	0 %	0 %	2.5%	0 %	0 %	86.1%	
	fish nk	6	11	14	1	0	5	10	5	3	3	4	138	**200**
		3%	5.5%	7%	0.5%	0%	2.5%	5%	2.5%	1.5%	1.5%	2 %	69 %	
														322
Observed Pounds	herring nk	30,004	0	5,620	0	100	150	0	0	410	0	0	20,622	**56,906**
		52.73%	0 %	9.9%	0 %	0.2%	0.3%	0 %	0 %	0.7%	0 %	0 %	36.2%	
	fish nk	110	692,240	67,065	20	0	90,430	169,450	108,000	4,700	52,000	23,050	72,766	**1,279,831**
		0.01%	54.1%	5.2%	0 %	0 %	7.1%	13.2%	8.4%	0.4%	4.1%	1.8%	5.7%	
														1,336,737

Table 154 Quantification of Fish NK and Herring NK (in Pounds) on Observed Hauls by Limited Access Herring Vessels in 2011

	species group	"kept"	"kept, transferred to other vessel"	"discarded, other"	"discarded, poor quality, gear damage"	"discarded, poor quality, reason not specified"	"discarded no market, retained by observer"	"discarded no market, too small"	"discarded no market, reason not specified"	"not brought onboard reason not specified"	"not brought onboard gear damage"	"not brought onboard fell out of gear"	"not brought onboard no market value"	"not brought onboard vessel capacity filled"	"not brought onboard not enough fish to pump"	TOTALS
Number of hauls with occurrence	herring nk	15	0	32	0	2	6	0	2	7	1	4	0	6	116	**191**
		7.9%	0%	16.8%	0%	1.1%	3.1%	0%	1.1%	3.7%	0.5%	2.1%	0%	3.1%	60.7%	
	fish nk	5	28	5	0	0	0	0	18	27	6	0	6	12	54	**161**
		3.1%	17.4%	3.1%	0%	0%	0%	0%	11.2%	16.8%	3.7%	0%	3.7%	7.5%	33.5%	
																352
Observed Pounds	herring nk	3,947	0	19,353	0	226	3.7	0	30	43,700	300	170	0	32,700	16,248	**116,678**
		3.4%	0%	16.6%	0%	0.2%	0%	0%	0.03%	37.5%	0.3%	0.2%	0%	28%	13.9%	
	fish nk	177,600	2,320,000	14,500	0	0	0	0	389	339,170	394,000	0	78,400	108,500	11,398	**3,443,957**
		5.2%	67.4%	0.4%	0%	0%	0%	0%	0.01%	9.9%	11.4%	0%	2.3%	3.2%	0.3%	
																3,560,635

6.3.2.2 Impacts of Measures Under Consideration to Address Net Slippage

In Amendment 5, the Council considered the following options to address net slippage on limited access herring vessels (see Section 3.2.3 for a more detailed description of the measures):

Option 1. **No Action/Status Quo**

Option 2. **Released Catch Affidavit**

Option 3. **Closed Area I Sampling Provisions**

Option 4. **Catch Deduction and Possible Trip Termination for Slippage Events**

(Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events)

The Council adopted the ***Preferred Alternative*** at the June 2012 meeting, with modifications to count slippage events against trip termination thresholds by gear type and management area. This is consistent with several comments received on the Amendment 5 DEIS expressing support for a hybrid approach that would establish trip termination provisions by fleet sector and/or management area, versus a fleet-wide allowance for slippage events. The Council considered these comments/suggestions and modified the ***Preferred Alternative*** accordingly. Additional information about the Preferred Alternative can be found in Section 3.2.3.4 of this document.

The impacts of the options considered by the Council on each of the VECs identified in Amendment 5 are discussed below.

6.3.2.2.1 General Impacts

The measures proposed to address slippage directly relate to the first objective of Amendment 5: to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery. Minimizing slippage events and better documenting slipped catch may improve estimates of bycatch in the fishery. To the extent that the amount and species composition of slipped catch can be sampled and/or estimated, catch monitoring will be enhanced. To the extent that slippage events can be reduced/eliminated, bycatch can be further minimized.

The measures under consideration in Amendment 5 to address net slippage also relate to the first two goals of the catch monitoring program (and some of the related objectives, identified below) that will ultimately be adopted in this amendment:

- To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species caught in the herring fishery;
- Develop a program providing catch of herring and bycatch species that will foster support by the herring industry and others concerned about accurate accounts of catch and bycatch, i.e., a well-designed, credible program;
    - Avoid prohibitive and unrealistic demands and requirements for those involved in the fishery, i.e., processors and fishermen using single and paired midwater trawls, bottom trawls, purse seines, weirs, stop seines, and any other gear capable of directing on herring;
    - Improve communication and collaboration with herring vessels and processors to promote constructive dialogue, trust, better understanding of bycatch issues, and ways to reduce discards;

- Eliminate reliance on self-reported catch estimates;

Enforcement Committee Comments May 2009

The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At the time, the following comments were made by the Enforcement Committee regarding the measures proposed in this section:

- It was noted that NEFOP observers already include digital photographs, usually one for every tow, and the photo documents are time/date stamped (Option 2 – Released Catch Affidavit).
- In general, a requirement for an affidavit serves as a reminder to fishermen that slipped catch must be documented. The measure would be more effective with a prohibition on slippage (see Option 3).

The Enforcement Committee reached the following consensus at the May 2009 meeting:

> *That if "all fish must be pumped aboard" is going to be included in the amendment, the Herring Committee should get some advice from NOAA General Counsel to word this in such a way that safety is considered.*

Additional Herring PDT Comments

- In general, a requirement for vessels to report slippage of catch (with reasons and estimates of discards) could be useful for improving catch monitoring and estimation of bycatch in the Atlantic herring fishery. Data on slippage events need to be collected in a more consistent manner, and this amendment provides an opportunity to implement the necessary provisions to do so.
- While developing Amendment 5, the Council determined that observer protocols already include documenting fish that remain in the net before they are released, and existing regulations require vessel operators to assist the observer in this process. Additional protocols have been implemented by the NEFOP to improve the collection of this information (see additional discussion below). It is important to acknowledge that the slippage definition used in this amendment does not include operational discards (see Section 3.2.3 for Amendment 5 slippage definition). **Options 2 and 4** (Released Catch Affidavit and Catch Deduction/Trip Termination), therefore, apply to slippage as defined in Amendment 5 and do not apply to operational discards. However**, Option 3** (CA I sampling provisions) is intended to be consistent with the recently-amended provisions for sampling and addressing net slippage in Closed Area I (changes implemented in the November 30, 2010 Rule for the Closed Area I provisions (CFR §648.80)). The recent changes to the rule extended the prohibition on releasing fish/discarding to operational discards. While the Council may still determine that the CA I provisions are most appropriate for sampling all catch in the fishery, the Herring PDT supports the NEFOP's approach to improve the collection of information about operational discards through its current sampling program.
- For the most part, relative to other measures under consideration, the measures to address slippage may be relatively cost-effective ways to improve sea sampling and the accuracy of catch information.
- **Option 2 (Released Catch Affidavit):** While the intent may be to provide a cross-check with the observer's log based on the captain's estimation of slipped catch, most captains are communicating with observers already and asking observers what they are recording for discards in the discard log. There is also already a place in the observer's log for the captain to provide additional information or his/her perspective on catch and discards in any cases where the captain may disagree with the observer's estimates (fishermen's comment log); this information becomes part of the NEFOP's formal database, and several have already been submitted. Moreover, observers already document operational discards and other events with photographs and are encouraged to take pictures in any instances where released catch can be observed and/or species identification is an issue. Vessel trip

reports (VTRs) represent the captain's estimate of catch under a legal mandate, subject to penalty under law if falsified. Therefore, requiring the Released Catch Affidavit may be redundant.

- **Option 3 (Closed Area I Sampling Provisions):** While the original provisions appear to have been feasible from a sampling and logistical perspective, the new provisions to require operational discards to be brought on board have not been practiced yet because the fleet has just begun fishing in Closed Area I this year. There may be some new challenges associated with bringing operational discards on board for some vessels.

  Another important consideration is that Option 3 proposes to adopt these provisions throughout the fishery on any trip with an observer on board, but it is unclear how these provisions may affect purse seine operations (only trawl vessels fish in Closed Area I). The operation of the purse seine fishery is substantially different than that of the trawl fishery, and consideration must be given to the size of the vessels, nature of the fishery, and practical implications of bringing the net on board to ensure that all operational discards come across the deck.

- **Option 4 (Catch Deduction and Possible Trip Termination - *Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*):** The Herring PDT does not support the sub-options that include a catch deduction for a slippage event. If this measure is intended to provide a disincentive for slipping catch (versus improving the sampling of slipped catch and the accuracy of catch data), then it will be important to account for the 100,000 pound catch deductions in a way that separates this catch from fish that are landed/sold, to avoid further discrepancies in the datasets. A separate code should be developed for the IVR/VMS/VTR data to identify the slipped catch, so that it remains separate from the other data. It also will be important to ensure that this catch is not included in the catch-at-age matrix.

  Regarding Option 4 as originally proposed, the Herring PDT noted the inconsistency associated with implementing a perceived punitive measure (catch deduction/trip termination) for slippage due to safety and gear malfunction, but not for slippage due to other factors (bycatch, market conditions, etc.). Moreover, safety issues for smaller vessels and purse seine vessels in the inshore Gulf of Maine may be different than those for larger vessels fishing offshore.

  **The additional sub-options under consideration for Option 4 were developed to address some of the Herring PDT's concerns with the original option.*

6.3.2.2.2 Impacts on Atlantic Herring

The Atlantic herring fishery is managed through sub-ACLs that are designed to prevent overfishing while addressing scientific and management uncertainty. The herring resource is currently not overfished, and overfishing is not occurring. At this time, available information about the frequency and/or contents of slipped nets is clearly improving in recent years and likely to continue to improve. Information from the NEFOP discard log should be available for inclusion in the Final EIS for Amendment 5.

Anticipating the effects that the measures to address net slippage may have on the Atlantic herring resource is challenging. For the most part, none of the options under consideration will have a direct biological impact on the herring resource. The herring resource is not overfished, and overfishing is not occurring. No matter which option is selected to address net slippage, the fishery would continue to be managed under sub-ACLs that are designed to prevent overfishing on the resource and/or any of its individual spawning components. Direct impacts of these options on the herring resource are therefore not expected.

However, there are indirect long-term benefits to the resource that would likely result from improvements to catch sampling, increased sampling, a reduction in unobserved catch (i.e., fish not brought on board), and an increase in the accuracy of bycatch estimates that result from observer sampling. These benefits are difficult to quantify with respect to each of the measures under consideration. The impacts relate to the potential for the measure to achieve those outcomes over the long-term, as long as sampling remains at levels sufficient to generate accurate and precise catch estimates that are representative of the fishery. As catch information improves, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. These impacts apply to all options under consideration that would maximize sampling and minimize slippage.

When evaluating each option separately, the following impacts to the herring resource can be identified:

Option 1 (No Action/Status Quo): Under the status quo, NEFOP efforts to better sample the fishery and characterize the nature, extent, and species composition of slipped catch would continue. The long-term benefits of improved catch monitoring on the herring resource are discussed above. However, under the no action option, provisions to enhance sampling and better monitor/document net slippage would not be mandated; the information collected by observers would continue to be provided by fishermen on a voluntary/cooperative basis. Therefore, relative to other options that may require documentation of slippage and/or implement provisions to enhance sampling, positive impacts on the herring resource resulting from the no action option may be less over the long-term.

Option 2 (Released Catch Affidavit): There were no Released Catch Affidavits filed in 2010 under the Closed Area I sampling provisions, so it is not clear what additional information, if any, the affidavit may provide that isn't already collected by observers. There appears to have been one released catch event (estimated 1,500 pounds) on a haul that ended (but did not begin) in Closed Area I.

It is difficult to predict any impacts on the herring resource resulting from this measure. Option 2 may provide documentation of some previously-unrecorded Atlantic herring removals (discards) that would then count against the herring sub-ACL. Consequently, the sub-ACL could be achieved faster, and the fishery could close sooner. Overall, herring abundance could increase, with the extent of the increase depending on the frequency of slipped nets and the magnitude of herring catches in those nets. However, the Released Catch Affidavits would still represent an estimate of the released catch. If Atlantic herring slipped catch is over-estimated, the sub-ACLs could be reached faster, producing a lower fishing mortality rate. If Atlantic herring slipped catch is under-estimated, then actual removals of herring (and fishing mortality) would be higher. However, available data indicate that slippage represents a small component of total catch. Even when assuming that Atlantic herring represents 100% of all slipped catch (very highly unlikely and not supported by the data), it does not appear that this measure would produce an impact on the herring resource that is much different than the status quo. Nonetheless, the quantification of previously unaccounted mortality could improve the data used in assessments, thereby decreasing scientific uncertainty, albeit to an unknown degree. The impact of this Option in comparison to Option 1 (no action) is therefore unknown, and difficult to compare to the other two Options.

Option 3 (Closed Area I Provisions): Option 3 would likely reduce the occurrence of slippage events and allow fish to be sampled that would have previously been unobserved. Thus, Option 3 may result in the documentation of some previously unrecorded Atlantic herring removals, with the effect on the herring resource being similar to that hypothesized for Option 2. The likelihood of obtaining more accurate information about herring removals is higher under Option 3 than under Option 2 or Option 1. In this context, this measure is likely to have a positive impact on the herring resource. Documenting previously unrecorded herring removals would also improve the catch statistics used in stock assessment,

thereby reducing scientific uncertainty to an unknown degree. Comparison to Option 4 is difficult as the Option considers deduction and termination, not monitoring.

Option 4 (*Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*): Comparison of Option 4 to the other options is difficult as this option considers catch deduction and trip termination, with less focus on monitoring. Compared to Option 1 (no action) however, the impacts are likely to be *low positive*. If catch deductions occur, Option 4 could result in sub-ACLs being attained more quickly with subsequent directed fishery closures occurring sooner. This action would likely result in an increase in herring abundance, but again, the magnitude of this increase is difficult to assess. Option 4C (***Preferred Alternative***) and Option 4D do not include the catch deduction, so the overall impact of these options on the herring resource would be similar to those expected under Option 3. Separating slippage thresholds by management area and gear type does not affect the determination regarding the impacts of the measure to the Atlantic herring resource; the proposed slippage thresholds are intended to provide backstops and discourage slippage events; trip termination in itself is not likely to impact the herring resource, but the full sampling provisions included in the ***Preferred Alternative*** should produce a low positive impact for reasons previously discussed.

6.3.2.2.3 Impacts on Non-Target Species and Other Fisheries

Option 1 (No Action/Status Quo): Under Option 1, no additional measures would be implemented in Amendment 5 to address net slippage. There are no additional impacts on non-target species and other fisheries expected under the status quo option, as the current measures in place to address the abundance and wellness of the fishery would be maintained. Some of the low positive impacts that may result from implementing one or more of the options under consideration to address net slippage (discussed below) would not occur under the no action option. While the impacts are difficult to predict, the impacts associated with documenting previously unrecorded bycatch, although minor, would not benefit non-target species and other fisheries.

Option 2 (Released Catch Affidavit): Option 2 may provide documentation of some previously-unrecorded removals (discards) of non-target species that may ultimately improve estimates of bycatch in the herring fishery. However, the Released Catch Affidavits would still represent an estimate of the released catch. Observers already document released catch with photographs and detailed information on the recently-implemented discard log, so it is unclear whether estimates of non-target species bycatch (discards) would be improved by the implementation of a released catch affidavit. Also, because available data indicate that slippage represents a small component of total catch in the limited access herring fishery, it is unlikely that this option would have significant impacts on non-target species and other fisheries. If this measure is effective, providing documentation of previously unrecorded bycatch of non-target species may improve catch statistics and subsequent assessment and management of those species over the long-term. Therefore the expected impact of this Option, in comparison to Option 1 (no action) is expected to be neutral; it is expected to have less of an impact that Option 3, as described below but is difficult to compare to Option 4 as it addresses monitoring and not deduction or termination.

Option 3 (Closed Area I Provisions): Relative to the other measures under consideration in this section, this measure may have the most positive impact on non-target species and other fisheries because it provides for more complete sampling of catch that is ultimately discarded at-sea. This option requires the sampling of operational discards in addition to prohibiting slippage except in specific circumstances. Providing documentation of previously unrecorded bycatch of non-target species may improve catch statistics and subsequent assessment and management of those species over the long-term. Therefore the

expected impact of this Option, in comparison to Option 1 (no action) is expected to be a low positive; it is difficult to compare to Option 4 as it addresses monitoring and not deduction or termination.

Option 4 (*Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*): This option discourages slippage and discarding by applying a herring catch deduction and/or requiring trip termination when slippage events occur, depending on the option. The catch deduction would not likely have an impact on non-target species and other fisheries. The Council's ***Preferred Alternative*** does not include the catch deduction and applies trip termination based on 10-event thresholds per gear type and management area. Trip termination could reduce the amount of effective fishing effort in an area throughout the course of the fishing season, thereby reducing bycatch and mortality of non-target species. It is difficult to predict the impacts of this option (and any of the sub-options) on non-target species and other fisheries because the impacts depend on how the fishery adapts/responds to the measure in terms of both avoiding slippage events and/or relocating/redistributing fishing effort if a management area closes earlier than expected because of the catch deductions. While the impacts on non-target species may be positive if vessels cannot fish in an area with high encounters of non-target species, the extent of the impacts will be determined by how fishing effort shifts and whether or not the fleet moves into an area(s) with a higher potential of encountering these species.

It is also important to note that Option 4 and the ***Preferred Alternative*** may affect mackerel fishery participants, as all limited access vessels (A/B/C) would be required to comply with the trip termination provisions. Amendment 14 to the Mackerel FMP proposes similar (yet slightly different) measures to address net slippage, so the overlap of these fisheries should be addressed during implementation of both amendments. Mackerel fishery participants may face trip termination if they are fishing in an area with a high number of slippage events, regardless of whether or not they are targeting herring. Additionally, if a herring management area closes earlier because of the catch deduction, the mackerel fishery will be precluded in this area as well. While the impacts on mackerel could be construed as positive, the mackerel fishery is not fully utilized at this time and is managed under catch levels that are intended to prevent overfishing.

The expected impact of this option, in comparison to Option 1 (no action) is expected to be neutral or low positive, but is difficult to compare as the various sub-options include herring catch deductions and trip termination provisions, the effects of which are difficult to predict.

6.3.2.2.4 Impacts on Physical Environment and EFH

Option 1 (No Action/Status Quo): Option 1 would maintain current sampling requirements with respect to net slippage and therefore no adverse effects on seabed habitats/EFH are expected. The same impacts are expected with Options 2 and 3. The effects of Option 4 are difficult to predict and therefore difficult to compare.

Option 2 (Released Catch Affidavit): Option 2 would maintain current sampling requirements with respect to net slippage and therefore no adverse effects on seabed habitats/EFH are expected. The same impacts are expected with Options 1 (no action) and 3. The effects of Option 4 are difficult to predict and therefore difficult to compare.

Option 3 (Closed Area I Provisions): Option 3 would maintain current sampling requirements with respect to net slippage and therefore no adverse effects on seabed habitats/EFH are expected. The same impacts are expected with Options 1 (no action) and 2. The effects of Option 4 are difficult to predict and therefore difficult to compare.

Option 4 (*Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*): Option 4 is intended to discourage slippage to the extent practicable by specifying assumed slippage catches that would be deducted from the area sub-ACL and/or by terminating trips if a collective threshold number of slippage events (five or ten, depending on the option) is reached. The catch deduction would not have any adverse effect on seabed habitats. However, trip termination could reduce the amount of effective fishing effort in an area throughout the course of the fishing season, and thereby reduce adverse effects to EFH, which again, are minimal/temporary in this fishery to begin with. It is difficult to predict the impacts of this option (and the sub-options) because they depend on how the fishery adapts/responds to the measure in terms of both avoiding slippage events and relocating/redistributing fishing effort if a management area closes early. The impacts of this action are therefore unknown with respect to the other options. Separating slippage thresholds by management area and gear type does not affect the determination regarding the impacts of the measure to the Physical Environment and EFH.

6.3.2.2.5 Impacts on Protected Resources

Option 1 (No Action/Status Quo): Under Option 1, no additional measures would be implemented in Amendment 5 to address net slippage. There are no additional impacts on protected resources expected under the status quo option, as the current measures in place to address bycatch and long-term management of the fishery would be maintained. Some of the low positive impacts that may result from implementing one or more of the options under consideration to address net slippage (discussed below) would not occur under the no action option. While the impacts are difficult to predict, the impacts associated with the potential for increased sampling, although minor, would not benefit protected resources.

Option 2 (Released Catch Affidavit): Requiring a Released Catch Affidavit, from the perspective of impacts to protected resources, is administrative in nature and therefore they are not likely to have any effect. The no action option (Option 1) would maintain status quo, and because the impacts Option 2 are likely to be negligible, there is no expected difference between the no action option and the action presented with respect to protected resources in the area.

Option 3 (Closed Area I Provisions): As was previously stated, this option requires the sampling of operational discards in addition to prohibiting slippage except in specific circumstances. Slippage has the potential to contain protected species, and so the measure to better document slippage events has the potential to increase the sampling of protected species that may be encountered by the herring fishery. This information could, in turn, help with the better understanding of protected resources. Overall, it would not be likely for fishery effort to increase or decrease in response to this action, so encounters of protected resources by the fishery are not likely to change either. Option 3 therefore has the potential to provide a low positive impact on protected resources in comparison to both Options 1 and 2.

Option 4 (*Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*): Both actions of catch deduction and trip termination have the potential to reduce the amount of fishing effort in an area throughout the course of the fishing season, thereby reducing encounter rates and potential mortality of protected resources in those areas. It is difficult to predict the impacts of this option (and the sub-options), however, on protected species because the impacts will depend on how the fishery decides to adapt or respond to the measures. There is the potential for the fishery to decide to avoid slippage events by relocating and redistributing fishing effort if a management area closes earlier than expected because of the catch deductions. This, in turn, has the potential to increase interaction with some protected species, or potentially decrease it with others. The magnitude of

fishing effort is likewise unknown, and so the frequency of encounters could go up or down. While the impacts on protected resources may be positive if vessels cannot fish in an area with high encounters of protected species, the extent of the impacts of Option 4 is unknown in relation to Option 1 (No Action), until the extent of the fishery movement of effort is realized.

6.3.2.2.6 Impacts on Fishery-Related Businesses and Communities

Option 1 (No Action/Status Quo): The impact of the no action option on herring fishery-related businesses and communities is expected to be neutral, as no additional measures would be implemented in Amendment 5 to address net slippage. The options considered in this amendment, including the ***Preferred Alternative***, increase sampling and documenting of slippage events in the fishery and are intended to improve catch information over the long-term. However, these measures are expected to cost the industry, as discussed below. Some of the options are expected to negatively impact fishery participants and fishery-related businesses and communities. These negative impacts would not be experienced under the no action option.

Other Options (2/3/4): The options under consideration to address net slippage may provide documentation of some previously-unrecorded Atlantic herring removals (discards) that would then count against the herring sub-ACLs. Consequently, the sub-ACLs could be achieved faster, and the fishery may close sooner. Under Option 2, the Released Catch Affidavits would still represent an estimate of the released catch. If Atlantic herring slipped catch is over-estimated, the sub-ACLs could be reached faster and the fishery could close prematurely. If the directed fishery in a management area closes prematurely, there is potential for lost fishing opportunity and revenues. If Atlantic herring slipped catch is under-estimated, then actual removals of herring (and fishing mortality) would be higher.

Option 2 (Released Catch Affidavit): The pecuniary economic impacts on the participants in herring fishery are expected to be neutral in comparison to Option 1 (no action). Any economic impacts to the herring fishery will be through increased administrative and regulatory burden. This is the lesser of the impacts when compared to Options 3 and 4.

Option 3 (Closed Area I Sampling Provisions): Option 3 relies less on estimates of discarded fish, as the observers may have more opportunity to fully sample all fish that are caught. While the original provisions appear to have been feasible from a sampling and logistical perspective, the new provisions to require operational discards to be brought on board have not been practiced yet because the fleet has not yet moved into the area around Closed Area I yet this year. There may be some new challenges associated with bringing operational discards on board for some vessels.

Option 3 proposes to adopt these provisions throughout the fishery on any trip with an observer on board; however, the effect of these provisions on purse seine operations is unclear because only trawl vessels fish in Closed Area I. The operation of the purse seine fishery is substantially different than that of the trawl fishery, and consideration must be given to the size of the vessels, nature of the fishery, and practical and safety implications of bringing the net on board to ensure that all operational discards come across the deck. Additionally, this provision has not been tested on Category C vessels, which primarily use bottom trawls. While many of these vessels may already bring the net and all fish across the deck, accommodations and adjustments to operations may be necessary for some vessels.

The restrictions already placed on midwater and pair trawl operations (e.g., the seasonal Area 1A closure) generally disadvantage this part of the fishery. Whereas requiring the extreme sampling in Closed Area I might be considered reasonable to document any interaction with groundfish in an area where groundfishing is not permitted, requiring these provisions wherever herring vessels go could be considered an inequitable burden. Further, if only the midwater and pair trawl vessels are required to comply, this could have the appearance of unfairness.

Any economic impacts to the herring fishery will be through increased time spent pumping fish aboard the vessel to be sampled and inspected by a NMFS-approved observer. The pecuniary impacts on the participants in herring fishery are therefore expected to be potentially low negative when compared to Option 1 (no action). This is a slightly larger impact than Option 2 but less than Option 4.

Option 4 (*Preferred Alternative is Option 4C – Full Sampling and Trip Termination After Ten Slippage Events*): In general, the option/sub-options proposing a catch deduction/trip termination are designed to create a disincentive for limited access herring vessels to slip catch. When choosing to slip a net or bring all fish onboard, vessel operators will compare the costs of bringing those fish aboard to the penalty associated with slippage. The costs of bringing fish aboard which would otherwise be slipped are the extra time spent in this activity and, possibly, decreases in vessel safety during poor operating conditions. To the extent that Option 4 (and Option 3, discussed above) compromise safety under some circumstances, both the herring fishery and communities would be negatively affected. The extent of impacts would depend on to what extent safety was affected (e.g., injury to loss of life for crewmembers and damage to loss of vessel for the boat) and the result. These costs are the same under all of the options/sub-options under consideration. The overall impact of this option, in comparison to Option 1 (no action) is therefore expected to be a negative impact. It is the highest impact in comparison to the other options.

Impacts of Proposed Catch Deductions and Trip Terminations

The penalties associated with a slipped net vary slightly under the sub-options. A deduction of 100,000 pounds per slippage event in each management area (Options 4A/4B) will reduce the total sub-ACL available to fishing vessels and possibly close management areas to directed fishing earlier during the year. The sub-ACLs are typically reached or approached in two of the four management areas (1A and 1B). For each slippage event in Areas 1A and 1B, aggregate revenues in the herring fishery would decline by $12,000-$15,000 depending on the price of herring. Under Options 4A and 4B, the slippage by an individual vessel will result in a penalty being imposed on the entire fleet. This may not be perceived as fair. Another fairness issue relates to applying these measures to Category C vessels; many Category C boats are smaller boats that do not even hold 100,000 pounds. A slippage event on a smaller trawl vessel, although less likely, would then result in a deduction larger than the vessel's entire trip. Such deductions could ultimately preclude the fishery.

The sub-ACLs are typically not reached in Areas 2 and 3 (see Section 5.5.1 – Affected Environment). In the near future, slippage events in Areas 2 and 3 are will not reduce aggregate revenues. However, if the harvest of herring approaches those sub-ACLs, aggregate revenues would decline by the same $12,000-$15,000 per slippage event in these areas as well.

Three sub-options (4B, 4C – ***Preferred Alternative***, and 4D) include trip termination as a direct consequence for a slippage event. This is an additional penalty for net slippage. These penalties would result in higher costs for fishing vessels which do slip a net. These costs will be highest for vessels which are fishing in the offshore areas, essentially requiring vessels to make a round-trip steam from their fishing location to port (see Table 138 on p. 423 for more information about operating costs).

Beyond the safety compromises that may develop under Option 4, trip termination could have negative economic and social consequences for individual businesses and communities out of proportion to the original intent for the measure. Costs associated with herring fishing trips are high, particularly with the current cost of fuel. Trips terminated prematurely could result in an unprofitable or even "broker" trip leaving not only the owners with debt, but crewmembers without income. The consequences of income loss could reverberate through the community, diminishing other businesses that supply the vessel as well as those who provide goods and services for the families of fishing industry participants. Considering that fishing participants are interested in landing their catch to pay for their costs and obtain a profit rather than dumping it at sea, the measures for slippage, particularly when it has been driven by safety or gear-related considerations are perceived as punitive and may compound the negative (social) impact of incidents that arise naturally from any fishing operation.

In 2010, there were a total of 29 of 582 observed hauls were slippage events; the distribution of these events across areas and the resulting decrease in revenues is presented in Table 155. Two scenarios for revenue changes are presented. In Scenario A, it is assumed that fishing effort and the management area sub-ACLs are similar to the 2010 fishing year. While there would be large sub-ACL deductions in Areas 2 and 3, these would have no effect on revenues because aggregate catch in each management area has been much lower than the sub-ACL. Scenario B describes the impact on the fishery if aggregate catch in each of the management areas is close to the sub-ACLs. This might occur if effort increases, the sub-ACLs decrease, or a combination of the two occurs.

It is important to recognize that if the sub-ACL deduction regulations proposed in this option were in place, vessels may reduce slippage (as intended), especially in Areas 1A and 1B. Therefore the foregone revenues and catch are likely to be ***lower*** than Table 155 suggests. Table 155 also contains the impacts of the trip termination regulations (10-trip threshold); there were two trips which would have been terminated due to excessive slippage in a management area if the slippage events are tallied across all gear types. The impacts of sub-option 4D would likely be greater because the proposed trip termination threshold is five (versus ten). Information presented in this analysis suggests that a five-trip threshold, when combined across gear types, could lead to trip termination events in Areas 1A, 2 and 3.

It is important to recognize that if the sub-ACL deduction regulations proposed in this option were in place along with trip termination provisions, vessels may reduce slippage. Therefore, the number of impacted trips is likely to be ***lower*** than suggested by Table 155. Amendment 5 proposed to increase the level of observer coverage above the 2010 level, to 100% for herring trips on Category A and B vessels (the majority of the directed herring fishery). If this occurs, it is possible that a higher number of slippage events would be observed even though the management options in this section provide incentives to reduce slippage. The potential impacts of establishing trip termination thresholds by gear type are discussed further below.

Table 155 Potential Impacts of Catch Deduction/Trip Termination Options (Based on 2010 Observer Data)

AREA	Catch Deduction Options				Terminated Trips
	Observed Slippage Events	Sub ACL Deduction	Revenue Change Scenario A ($0.15/lb.)	Revenue Change Scenario B ($0.15/lb.)	
1A	8	800,000	$120,000	$120,000	0
1B	1	100,000	$15,000	$15,000	0
2	12	1,200,000	$0	$180,000	2
3	8	800,000	$0	$120,000	0

Information collected by observers about slipped catch in 2011 suggests that the proposed trip termination thresholds (by gear type and management area) may produce a greater effect than that suggested by the 2010 data (above) and may particularly impact the purse seine fleet in Area 1A and the midwater trawl fleet fishing in all areas.

Table 151, Table 152, Figure 88, and Figure 89 (see Section 6.3.2.1.4 on p. 455 of this document) provide 2011 observer data by gear type and management area, including observed hauls with catch "Not Brought on Board," i.e., full or partial slippage events (shaded rows in the following tables). Based on the ratio of slipped catch to total catch, purse seine vessels fishing in Area 1A had the highest observed slippage rates in the fishery during the 2011 fishing year. Observers documented full or partial slippage events on almost 30% of observed purse seine hauls in Area 1A during 2011. Coverage was low on purse seine vessels relative to other gear types in the fishery; the proposed trip termination threshold of ten slippage events per gear type and management area, therefore, may constrain purse seine activity in Area 1A and may impact purse seine operations, especially if observer coverage is increased to 100% for Category A and B vessels.

Single midwater trawl vessels were not observed to have many slippage events in 2011; only four slippage events were observed on single midwater trawl vessels across all management areas. However, when grouped with pair trawls as proposed in the measures to address slippage (Section 3.2.3.4), the single midwater trawl sector may be likely to encounter trip terminations in Areas 2 and 3, particularly with 100% observer coverage on Category A and B herring vessels. Pair trawl vessels were observed to have 8 slippage events in Area 2 and 19 in Area 3 during 2011, with about 30% observer coverage across the fishery (although closer to 80% in Area 3). Single midwater trawl vessels, however, accounted for the largest slippage events, averaging about 50,000 pounds per observed event. Purse seine vessels averaged 15,190 pounds per observed slippage event, and pair trawl vessels in Area 3 averaged about 9,000 pounds per event.

In summary, the impacts of this option, including the ***Preferred Alternative***, are expected to be negative for fishery-related businesses and communities.

6.3.3 Impacts of Maximized Retention Alternative

In Amendment 5, the Council considered an alternative that would allow NMFS to conduct an experimental fishery for four years to evaluate the appropriateness and need for a maximized retention program on limited access herring vessels. Alternative 1, No Action, represents the Council's ***Preferred Alternative***.

6.3.3.1 General Impacts

The Enforcement Committee met on May 8, 2009 to discuss issues related to the development of this amendment and provide preliminary input. At the time, the Committee discussed issues related to maximized retention but did not develop any consensus statements or provide any recommendations specific to the MR alternative currently under consideration in Amendment 5. Enforcement Committee comments related to maximizing sampling and requiring all fish to be brought on board have been summarized in previous sections of this document.

Additional Herring PDT Comments

- Under the assumption of full compliance (no slippage and/or at-sea discarding), maximized retention could provide an opportunity to sample at-sea catch that would have otherwise been discarded. The amount of various species would still be estimated, however, unless the entire catch was disaggregated into species and fully sampled. Complete sampling would have to occur dockside under a maximized retention program.
- In any well-designed experiment, there is a "study group/experimental group" and a "control group;" the control group is practically identical to the experimental group, although the experimental group is changed according to some key variable of interest, while the control group remains constant during the experiment. This provides for a basis of comparison and statistical evaluation with all other variables remaining constant between the two groups. In this alternative, all limited access herring vessels would be part of the experimental group, as MR would be required on all trips with observers on board. Because of changes to observer protocols and improved sampling of high-volume fisheries in recent years, comparisons to observer data from prior years (as the "control group") may not be appropriate. This should be addressed if an experimental fishery is to be developed in the future. It is unclear how vessels would be selected for either a control group or an experimental group since there are no incentives to participate in the experiment at this time.

Several challenges would need to be addressed by NMFS to the extent possible when designing provisions for a maximized retention (MR) experimental fishery:

- Separating the harvest from the unwanted catch may be difficult for some vessels and could reduce vessel capacity.
- Test tows should be considered. Fishermen may make a short tow to determine the composition and/or quality of fish they are catching before fully loading the bag. If the fish in the test tow are not desirable, the vessel can release the bag and move elsewhere. This is addressed in the Closed Area I provisions by requiring that the fish from the test tow remain in the net until the subsequent pumpout.
- Sampling of unwanted discarded catch should be a primary component of any MR program.
- The disposal of unwanted/unmarketable catch should be addressed.

- Safety concerns should be addressed. For example, slippage events have been noted due to full vessel capacity and gear problems. Exemptions (similar to Closed Area I) should be considered in a MR program.
- Because MR requires that all fish be landed (not just brought on board the vessel for sampling), concerns related to compromising the quality of the catch should be addressed.

6.3.3.2 Impacts on Atlantic Herring

Alternative 1 (No Action, Preferred Alternative): The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action alternative relative to the maximized retention alternative would not be expected to affect the status of the herring resource, and the no action alternative is expected to have a neutral impact on herring. Alternative 1, No Action, represents the Council's ***Preferred Alternative***. Some of the indirect long-term benefits from the maximized retention alternative under consideration (if the experimental fishery is conducted) would not be realized under the no action alternative, but, as discussed below, the maximized retention alternative is expected to have very low positive impacts on the resource.

Alternative 2: Maximized retention would likely have little effect on the herring resource because it would not affect the mortality rate exerted on the stock, but only force fish to be landed that would have otherwise been discarded or slipped. Over the long-term, maximized retention has the potential to improve the calculation of catch statistics and quantification of landed bycatch if it is applied in concert with a portside sampling program to determine the catch composition, once an experimental fishery is conducted to evaluate the need and effectiveness of MR and the objectives of a portside sampling program. Since no such portside program is currently under consideration, this benefit will likely not be realized under the alternative proposed in Amendment 5. If the alternative is selected and the experimental fishery is conducted, however, some previously undocumented herring mortality may be recorded by dealers and observers, which may modestly improve catch statistics and the assessment and management of the resource. Therefore, overall, this alternative could potentially have a low positive impact on Atlantic herring, but the outcome is generally unknown in comparison to the no action alternative because so many of the elements of the experimental fishery remain unclear.

6.3.3.3 Impacts on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment).

Alternative 1: Alternative 1, No Action, represents the Council's ***Preferred Alternative***. Because no action would maintain current conditions relative to maximized retention provisions, the impacts of this alternative are expected to be neutral, but any benefits resulting from a maximized retention program in the fishery would not be realized. In general, a maximized retention program could increase the scientific knowledge available to fisheries managers about bycatch of non-target species. Maximized retention has the potential to improve the calculation of catch statistics and quantification of landed bycatch (non-target species) if it applied in concert with a portside sampling program to determine the catch composition of landings, once an experimental fishery is conducted to evaluate the need and effectiveness of MR and the objectives of a portside sampling program. Since no such portside program is currently under consideration, this benefit will likely not be realized under the alternative proposed in Amendment 5, and any benefits from the alternative under consideration remain generally unknown (see below).

Alternative 2: If the alternative is selected and the experimental fishery is conducted, however, some previously undocumented catch/mortality of non-target species may be recorded by dealers and observers, however, but this is not likely to improve catch statistics and assessments for non-target species. Overall, this action may have a low positive impact on non-target species and other fisheries, but the outcome is generally unknown in comparison to the no action alternative because so many of the elements of the experimental fishery remain unknown.

Maximized retention has the potential to improve the calculation of catch statistics and quantification of landed bycatch (non-target species) if it applied in concert with a portside sampling program to determine the catch composition of landings, once an experimental fishery is conducted to evaluate the need and effectiveness of maximized retention and the objectives of a portside sampling program. Since no such portside program is currently under consideration, this benefit will likely not be realized under the alternative proposed in Amendment 5. The impacts of a maximized retention program on mackerel fishery participants with limited access herring permits would need to be evaluated by NMFS when developing the details of an experimental fishery under this alternative.

6.3.3.4 Impacts on Physical Environment and EFH

This alternative proposes implementing maximized retention on an experimental basis during some directed herring trips. Adoption of this option is not likely to have any adverse effect on EFH, and the impact can likely be considered neutral in comparison to the No Action Alternative. Alternative 1, No Action, represents the Council's ***Preferred Alternative***.

6.3.3.5 Impacts on Protected Resources

Although the issuance of exempted fishing permits would allow for the collection of more information on bycatch species, the data collection is not likely to extend to the reach of protected species, as current regulation (the Endangered Species Act and the Marine Mammal Protection Act) would not allow them to be included in the exemption. Therefore the study of protected resources would likely not be benefitted by the action, and the impact can likely be considered neutral in comparison to the No Action Alternative. Alternative 1, No Action, represents the Council's ***Preferred Alternative***.

6.3.3.6 Impacts on Fishery-Related Businesses and Communities

Alternative 1, No Action, represents the Council's ***Preferred Alternative***. The no action alternative would maintain status quo conditions and would not establish a maximized retention experimental fishery after the implementation of Amendment 5. There are no additional impacts expected on fishery-related businesses and communities under the no action alternative. Because the impacts of the proposed maximized retention alternative are unknown (see discussion below), there is no measureable difference between impacts expected on fishery-related businesses and communities from selecting the no action alternative or the maximized retention experimental fishery alternative.

The maximized retention alternative would create a maximized retention experimental fishery program in the directed Atlantic herring fishery for all trips which carry an observer. This program could impact the Atlantic herring fishery in two ways. First, retaining certain species, particularly a species like spiny dogfish, could degrade the quality of the catch by damaging in while in the fish hold. Second, retention of non-marketable fish in the hold of a vessel reduces the amount of marketable fish which can be landed. The magnitude of these effects are unknown at this time.

The impacts of maximized retention on herring businesses would depend on the details of how this option is implemented. The only potential benefit to herring-related businesses would be that they would be able to document their entire catch so that rumors of bycatch or quota-busting could be disproved. However, the negative impacts could be serious if, for example, the vessels are not able to separate desired from undesirable catch, the whole catch would be tainted. The industry as a whole has improved the quality of the catch by investing in refrigerated seawater systems and increased freezer capacity. Diminishing the quality would decrease marketing opportunities (e.g., food exports) and invariably lower prices. Furthermore, diminishing quality could affect other industries dependent on herring. The lobster fisheries, for example, currently uses high quality herring for bait. If unwanted catch is returned to the vessel after sampling for dumping at sea, the fuel costs could have serious negative impacts. Time and money implications could also arise from the implementation.

The communities identified in the Affected Environment rely on herring-related businesses as a significant portion in the mix of businesses that provide income for their residents either directly or indirectly. While none of the communities identified are solely dependent on the herring fishery, some, such as those in Downeast Maine, rely on the herring fishery for bait for their lobster fisheries. Others rely on the income dispersed through the community from the sale of herring. To the extent that any of these options diminish the ability of the herring-related businesses to survive economically, the community would be affected through the loss of jobs, both in the industry and among the servicers of the industry.

The overall impact of the MR alternative, in comparison to Alternative 1 (no action, ***Preferred Alternative***) is unknown at this time. If the MR alternative is selected, impacts on fishery-related businesses and communities would need to be evaluated more thoroughly based on the details and provisions included in the experimental fishery.

6.4 IMPACTS OF MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH (SECTION 3.3)

This section addresses the potential impacts of the management alternatives under consideration to address river herring bycatch. A detailed analysis of the potential impacts of the management alternatives under consideration in Amendment 5 to address river herring bycatch is provided in Appendix VI of this document (Volume II). In addition, information/analyses provided by the Herring PDT during the development of the measures to address river herring bycatch can be found in Volume II, Appendix IV.

The majority of the analysis to determine the impact of specific management measures on river herring populations is qualitative. The Herring PDT modeled river herring distribution at sea using NEFSC trawl survey data and detected spatial and temporal patterns of river herring bycatch in the directed Atlantic herring fishery from NEFOP data. However, many unknowns remain including but not limited to river herring stock status, overfishing/overfished status, population stock structure, coastwide biological reference points, mixing rates of pelagic species at sea, how to link river data with at sea data, the genetic structure of populations. Many of these research questions/needs are currently being addressed by many institutions, but the work/results have yet to be completed/published.

The following discussion provides a comprehensive summary of the impacts of the alternatives under consideration on the five VECs identified in Amendment 5. The Council's ***Preferred Alternative*** is identified throughout the following analysis. The ***Preferred Alternative*** proposes to establish River Herring Monitoring/Avoidance Areas and implements a two-phase river herring bycatch avoidance strategy based on increased monitoring in those areas combined with follow-up from an ongoing industry-based bycatch avoidance program, and a future Council action to establish river herring catch caps (identified by the Council as a management priority for 2013).

6.4.1 Background Information

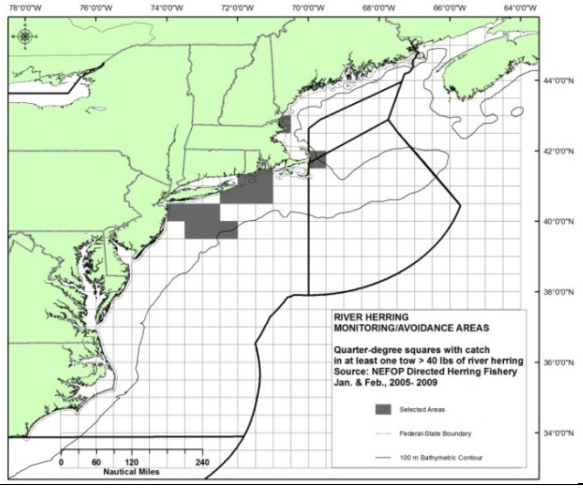
6.4.1.1 Alternatives Considered and Discussion of the *Preferred Alternative*

- Alternative 1: No Action (Status Quo – Section 3.3.1)
- Alternative 2 (*Preferred Alternative*): River Herring Monitoring/Avoidance (Section 3.3.2)
    - Establishment of River Herring Monitoring/Avoidance Areas (Section 3.3.2.1)
    - **Option 1:** 100% Observer Coverage in RH Monitoring/Avoidance Areas with sub-options for vessels to which the option applies (Section 3.3.2.2.1)
    - **Option 2:** Closed Area I Sampling Provisions in RH Monitoring/Avoidance Areas with sub-options for 100% observer coverage or less than 100% coverage, and sub-options for vessels to which the option applies (Section 3.3.2.2.2)
    - **Option 3:** Trigger-Based Monitoring with sub-options for RH catch triggers and related catch reporting requirements (either Option 1 or Option 2 would apply if/when trigger is reached – Section 3.3.2.2.3)
    - **Option 4 (*Preferred Alternative*):**Two-Phase Bycatch Avoidance Approach Based on SFC/SMAST/DMF Project (Phase I in Amendment 5 establishes areas, works with industry to obtain more information, and establishes a mechanism for implementing bycatch avoidance strategies, if appropriate, after the project is completed; Phase II requires a follow-up meeting and determination of appropriate action after the project is completed – See Section 3.3.2.2.4)
- Alternative 3: River Herring Protection (Section 3.3.3)
    - Establishment of River Herring Protection Areas (Section 3.3.3.1)
    - **Option 1:** Closed Areas for A/B/C/D permit holders fishing with mesh smaller than 5.5 inches with a sub-option for limited access herring vessels to declare out of the fishery for a period of time (Section 3.3.3.2.1)
    - **Option 2:** Trigger-Based Protection Areas with sub-options for RH catch triggers and related catch reporting requirements (Protection Areas would be implemented if/when trigger is reached – Section 3.3.3.2.2)
- Mechanism for Adjusting/Updating River Herring Areas/Triggers (Section 3.3.4)
- River Herring Catch Caps (***Preferred Alternative***, Section 3.3.5)

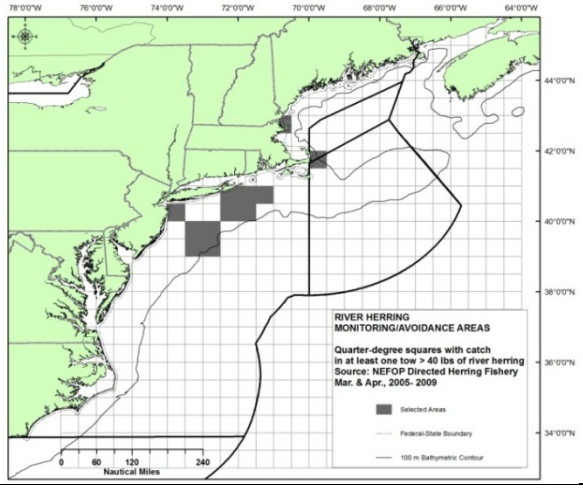
The Council considered sub-options to apply the management measures to address river herring bycatch to either Category A/B (limited access directed fishery), Category A/B/C (all limited access vessels), or Categories A/B/C/D (all herring vessels, including open access vessels and vessels that receive new permits that may established in this amendment). At this time, the measures to address river herring bycatch in Amendment 5 are intended to apply to the limited access herring fishery (Category A/B/C) with no exemptions.

Figure 90 Proposed River Herring Monitoring/Avoidance Areas (Alternative 2, *Preferred Alternative*)

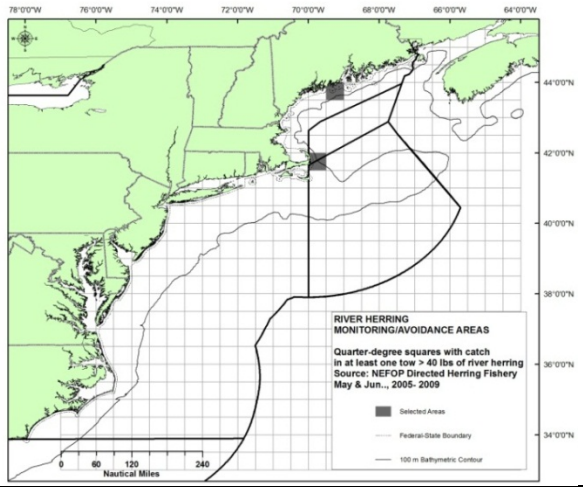
January – February



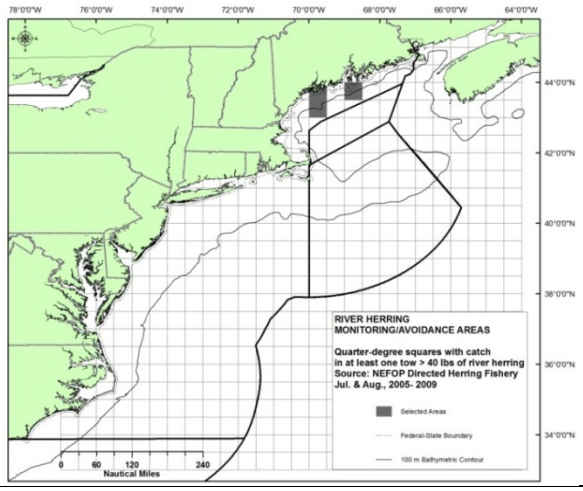
March – April



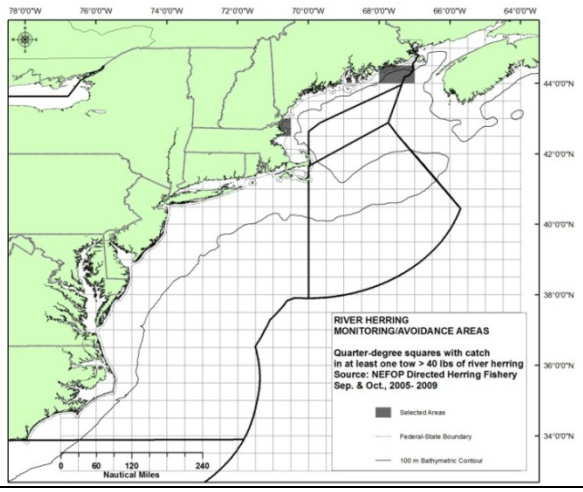
May – June



July – August



September – October



November – December

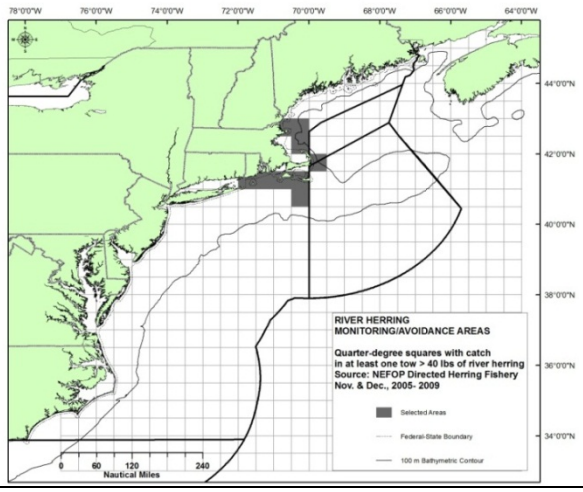
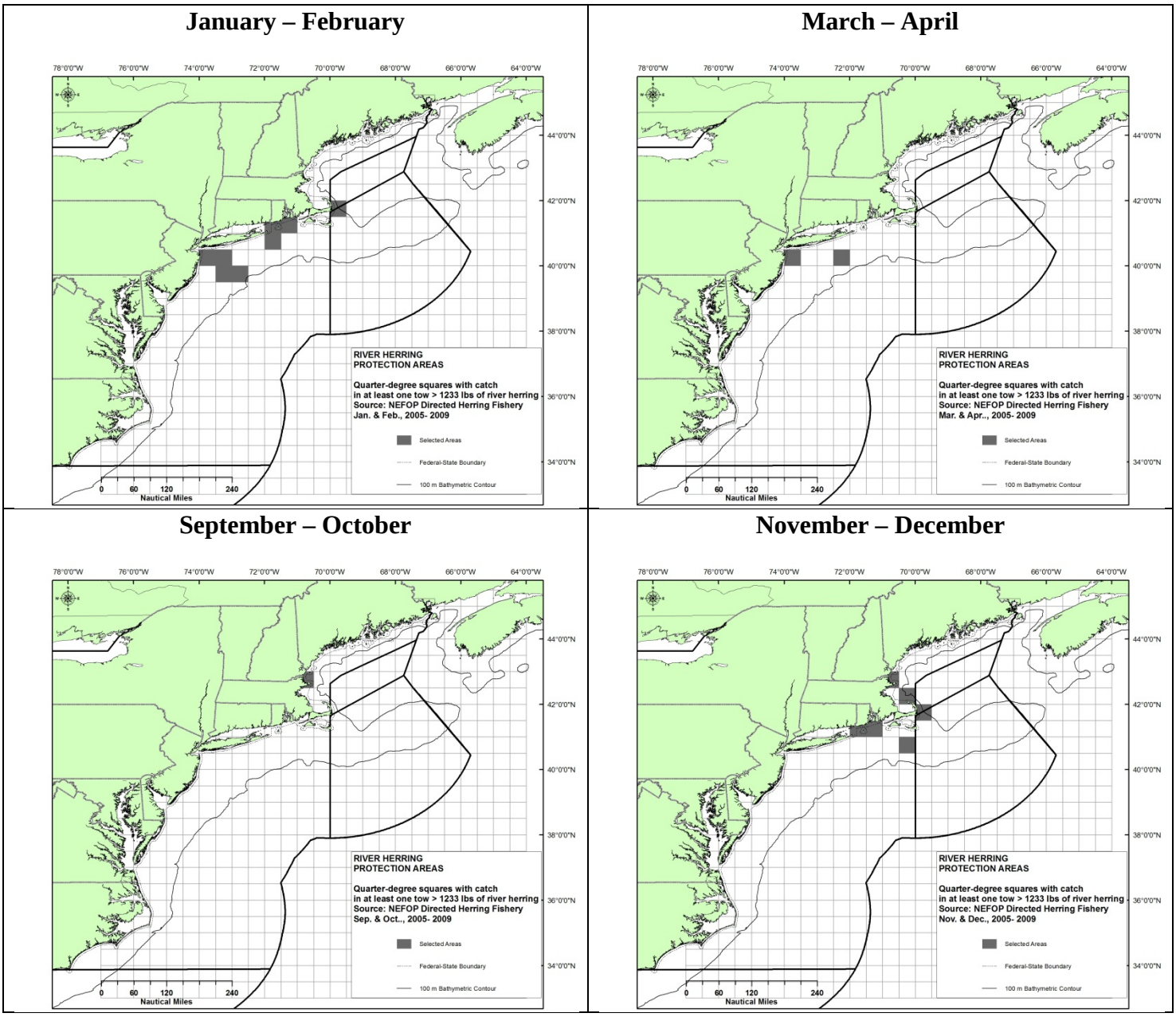


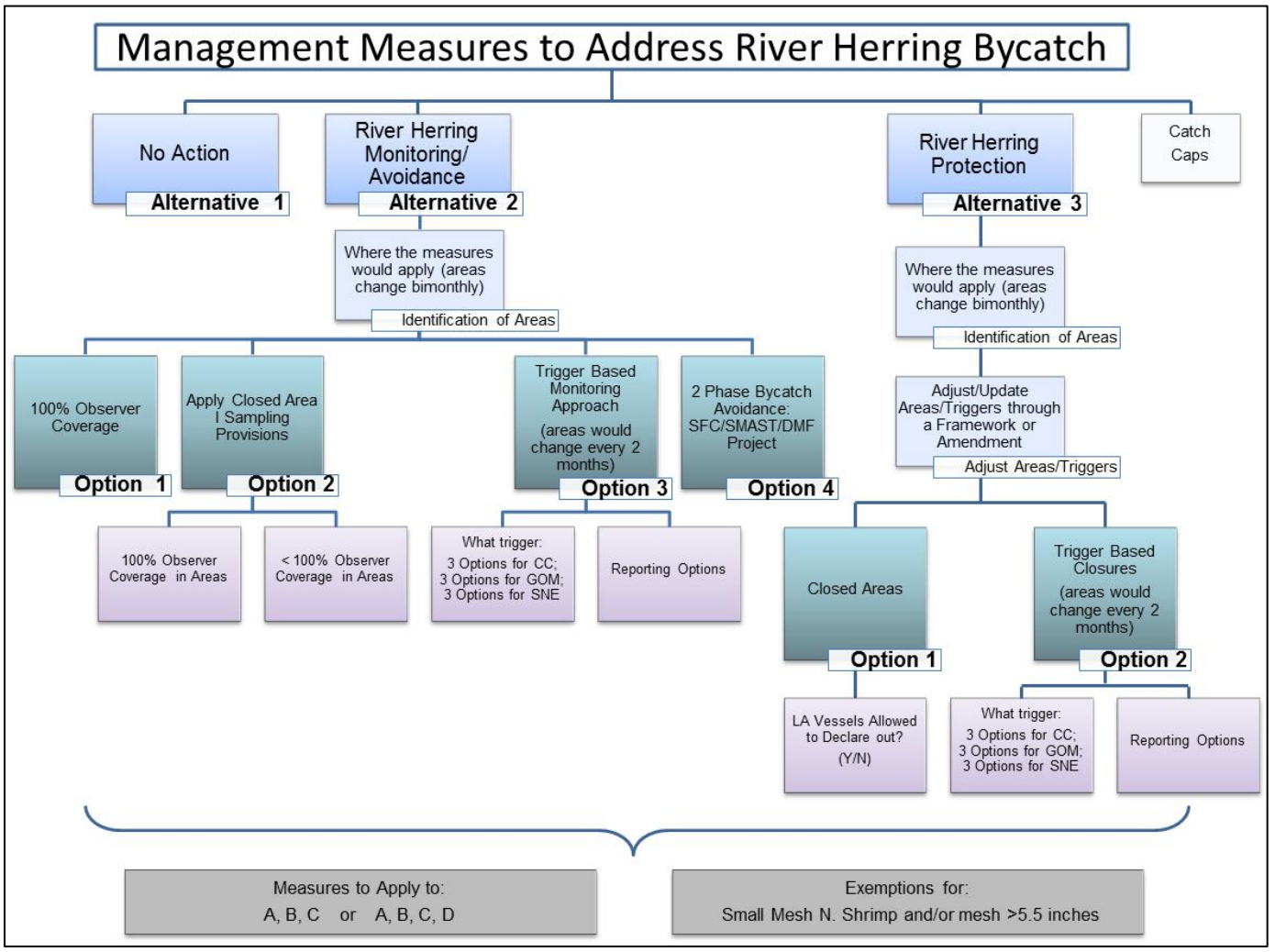
Figure 91 Proposed River Herring Protection Areas (Alternative 3)



Under Alternative 3, no River Herring Protection Areas would be established from May-August.

Note Alternative 3 is not the Preferred Alternative.

Figure 92 Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch



The Council's Preferred Alternative is Alternative 2, Option 4, applied to all limited access herring vessels (Category A/B/C). No exemptions are proposed.

Establishing a river herring catch cap through a framework adjustment is also a Preferred Alternative.

Alternative 2 represents the Council's *Preferred Alternative,* selected at the June 2012 Council meeting. This alternative proposes to establish River Herring Monitoring/Avoidance Areas and includes options for implementing additional catch monitoring provisions in those areas.

Options 1, 2, and 3 under Alternative 2 propose additional monitoring requirements in the River Herring Monitoring/Avoidance Areas. While these options do not represent the Council's ***Preferred Alternative*** for measures to address river herring bycatch, most of the measures proposed within these options are also proposed to be implemented across the limited access herring fishery as part of the catch monitoring program in Amendment 5. Therefore, many of the expected impacts have already been discussed/addressed in this document (see section references below). Moreover, it is important to acknowledge the additional impacts (positive and negative) that are likely to result from the overall management action proposed in Amendment 5. The impacts of the measures to address river herring, for example, may include not only those resulting from the ***Preferred Alternative*** in this section, but also from the catch monitoring program.

Option 1 would require 100% observer coverage in the river herring Monitoring/Avoidance and/or Protection Areas; Option 2 would require the Closed Area I sampling provisions to apply to these areas; Option 3 would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area.

- While Option 1 (100% Observer Coverage) is not the ***Preferred Alternative*** in this section, 100% observer coverage is proposed for Category A and B herring vessels as part of the catch monitoring program in this amendment (Section 3.2.1.2), which addresses the vast majority of the herring fleet. Additionally, the Council is proposing not to authorize waivers for observer coverage in areas associated with measures to avoid or protect river herring. The impacts of implementing Option 1 in the River Herring Monitoring/Avoidance Areas are therefore expected to be similar to those discussed under the ***Preferred Alternative*** in Section 6.2 (Impacts of Alternatives to Allocate Observer Coverage).
- Option 2 (Closed Area I Provisions) is also proposed in Amendment 5 as a management measure to address net slippage across the entire limited access herring fishery (Section 3.2.3). The impacts of implementing Option 2 in the River Herring Monitoring/Avoidance Areas are expected to be similar to those discussed under the ***Preferred Alternative*** in Section 6.3.2.2 (Impacts of Measures to Address Net Slippage).
- Option 3 (Trigger-Based Monitoring/Avoidance – *not preferred*) would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area. Option 3 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the measures would not apply in the areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached.

Option 1 requires 100% observer coverage in the River Herring Monitoring/Avoidance Areas and may increase sampling. Option 2 may reduce the occurrence of slippage events in and allow fish to be sampled that would have previously been unobserved. A detailed analysis of available information about slippage is presented in Section 6.3.2.1 of this document.

Option 4 (Preferred Alternative): Two-Phase Bycatch Avoidance Strategy

Specific to addressing river herring bycatch, the Council supports a long-term avoidance strategy developed in cooperation with the fishing industry. Option 4 proposes such an approach and represents the Council's ***Preferred Alternative***. Under this option, the industry would share information to avoid bycatch in the Monitoring/Avoidance Areas, and additional catch monitoring would be mandated under the other provisions proposed in Amendment 5.

6.4.1.2 River Herring Catch Comparison

To place the most recent (2010 and 2011) river herring catch estimate from the Atlantic herring fishery into perspective, a catch estimate comparison was completed by the Herring PDT and is presented in Appendix VI (Volume II). This includes a summary of all available published and unpublished studies on at-sea river herring catch. Reported river herring catch estimates included data from 1989-2010, although estimates for the directed Atlantic herring fishery were not available for all years. Each study had a different purpose, stratification, and estimation method that should be considered when comparing across different studies. Notably, some studies used kept river herring catch, discarded river herring catch, or both kept and discarded river herring catch in their estimates.

Table 156 compares the most recent estimated river herring catch by the directed Atlantic herring fishery (165,915 lbs.) to that estimated for all at-sea fleets (531,314 lbs.) and the directed in-river fishery for alewife in Maine (1,342,293 lbs.). However, reviewing estimates from years prior to 2010, at-sea river herring catch estimates are highly variable year-to-year as well as associated CVs.

Table 156 River Herring Catch Comparison for 2010 Data

	2010 River Herring Catch		
Fishery	**Catch (lbs.)**		**Source**
Maine Directed Alewife Landings	1,342,293		Maine DMR
All Fleets (estimated)	531,314	*	NEFSC
Directed Herring Fleet (estimated)	165,915	**	Herring PDT
* High of 3.6 mil lbs. in 1997 (1989-2010)			
** High of 1.9 mil lbs. in 2007 (2005-2010)			

Table 30 on p. 186 of this document (Affected Environment, Other Fisheries) updates river herring catch information and provides 2011 river herring catch (in pounds) reported to the ASMFC by individual States. Maine directed landings were reported to be 1.1 million pounds, with an additional 536 pounds of shad landings reported.

6.4.1.3 River Herring ESA Petition

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). 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 are expected to be available in late 2012 or early 2013. 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.

6.4.2 Impacts on Atlantic Herring

6.4.2.1 Impacts of Alternative 1 (No Action Alternative) on Atlantic Herring

Under Alternative 1, no additional management measures would be implemented in Amendment 5 to address river herring bycatch. The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. 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 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The Atlantic herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the no action alternative in this case is therefore not likely to affect removals of Atlantic herring from the fishery. There are no additional impacts on the herring resource expected from Alternative 1, and the impacts are expected to be *neutral*.

Some of the measures under consideration to address river herring bycatch may have positive impacts on the Atlantic herring resource through increased monitoring and data collection (see discussion of Alternative 2, the ***Preferred Alternative***, below). These potential impacts on Atlantic herring are discussed in the following subsections. The benefits of these measures would not be realized under the no action alternative.

6.4.2.2 Impacts of Alternative 2 (River Herring Monitoring/Avoidance – ***Preferred Alternative***) on Atlantic Herring

Alternative 2 represents the Council's ***Preferred Alternative***, selected at the June 2012 Council meeting. This alternative proposes to establish River Herring Monitoring/Avoidance Areas and includes options for implementing additional catch monitoring provisions in those areas. Overall, none of the options under consideration in Alternative 2 will have a direct biological impact on the herring resource. The herring resource is not overfished, and overfishing is not occurring. The Atlantic herring fishery would continue to be managed under sub-ACLs that are designed to prevent overfishing on the resource and/or any of its individual spawning components. Alternative 2 is not expected to affect total removals of Atlantic herring from the fishery.

However, there are indirect long-term benefits to the Atlantic herring resource that would likely result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch (i.e., fish not brought on board), which the measures proposed under Alternative 2 are intended to do, primarily to address river herring concerns. As catch information in the fishery continues to improve, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The benefits to the herring resource are difficult to quantify with respect to

the individual options under consideration in Alternative 2 but are expected to be *low positive* in comparison to Alternative 1 (no action). The selection of vessels to which these measures apply (permit categories A/B/C and/or D) may marginally increase or decrease the impacts on Atlantic herring, but not likely to a measurable extent. Exemptions under consideration for the Northern shrimp fishery and large-mesh groundfish fishery do not affect this determination with respect to impacts on the Atlantic herring resource.

Options 1, 2, and 3

Options 1, 2, and 3 propose additional monitoring requirements in the River Herring Monitoring/Avoidance Areas. As previously noted, many of the expected impacts have already been discussed/addressed in this document (see section references below). Moreover, it is important to acknowledge the additional impacts (positive and negative) that are likely to result from the overall management action proposed in Amendment 5.

- One hundred percent (100%) observer coverage (Option 1) is proposed for Category A and B herring vessels as part of the catch monitoring program in this amendment (Section 3.2.1.2), which addresses the vast majority of the herring fleet. Additionally, the Council is proposing not to authorize waivers for observer coverage in areas associated with measures to avoid or protect river herring. The impacts on the herring resource of implementing Option 1 in the River Herring Monitoring/Avoidance Areas are therefore expected to be similar to those discussed in Section 6.2.2 (Impacts of Alternatives to Allocate Observer Coverage on Atlantic Herring). The impacts are expected to be *low positive*, relative to taking no action.
- Option 2 (Closed Area I Provisions) is also proposed in Amendment 5 as a management measure to address net slippage across the entire limited access herring fishery (Section 3.2.3). The impacts on the herring resource of implementing Option 2 in the River Herring Monitoring/Avoidance Areas are expected to be similar to those discussed in Section 6.3.2.2.2 (Impacts of Measures to Address Net Slippage on Atlantic Herring). The impacts are expected to be *low positive*, relative to taking no action.
- Option 3 (Trigger-Based Monitoring/Avoidance – *not preferred*) would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area. Option 3 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the measures would not apply in the areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached. Overall, the impacts are still expected to be *low positive*, relative to taking no action.

Option 1 requires 100% observer coverage in the River Herring Monitoring/Avoidance Areas and may increase sampling. Option 2 may reduce the occurrence of slippage events in and allow fish to be sampled that would have previously been unobserved. Thus, Option 2 may result in the documentation of some previously unrecorded Atlantic herring removals. Documenting previously unrecorded herring removals would also improve the catch statistics used in stock assessment, thereby reducing scientific uncertainty to an unknown degree. A detailed analysis of available information about slippage is presented in Section 6.3.2.1 of this document.

Option 4 (Preferred Alternative): Two-Phase Bycatch Avoidance Strategy

Similar to the other options, the impacts of a long-term river herring bycatch avoidance strategy on the Atlantic herring resource are likely to be positive to the extent that they enhance catch monitoring and data collection in the River Herring Monitoring/Avoidance Areas. There may be additional long-term benefits on the herring resource from Option 4, however, if the industry can work cooperatively to develop a long-term avoidance strategy. The communication network and cooperative relationships developed under Option 4 may lead to enhanced catch/bycatch management of all species in the fishery and could ultimately improve herring catch monitoring. However, because Option 4 proposes a two-phase avoidance strategy developed by the industry, impacts on the herring resource resulting from implementing the provisions proposed Option 4 as part of Amendment 5 are not expected. Under this option, the industry would share information to avoid bycatch in the Monitoring/Avoidance Areas, but additional catch monitoring would not be mandated, and no new catch reporting requirements or sampling protocols would be implemented; the impacts of this option on the Atlantic herring resource are therefore expected to be *neutral*.

6.4.2.3 Impacts of Alternative 3 (River Herring Protection) on Atlantic Herring

Alternative 3 proposes to establish River Herring Protection Areas and seasonally (bimonthly) close these areas to herring fishing to some/all herring vessels. Protection areas might provide mortality protection for co-occurring Atlantic herring. This, however, is dependent on Atlantic herring life history and migratory patterns along with their susceptibility to fishing gears at different life stages. In particular, many of the bimonthly monitoring/avoidance areas overlap Atlantic herring EFH at various life stages (see Figure 65 – Figure 68).

The Atlantic herring resource is not overfished and overfishing is not occurring. The herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The selection of Alternative 3 is not likely to affect total removals of herring from the fishery, and the impacts of Alternative 3 on herring, therefore, are expected to be neutral.

Option 1 would implement seasonal closures in the bimonthly River Herring Protection Areas for the entire fishing year. Many of the blocks proposed for seasonal closure under Alternative 3 overlap substantially with the herring fishery, suggesting that directed herring fishing effort may be reduced, at least seasonally, in some of the areas. While these areas would be closed to some/all herring fishing on a seasonal basis, it is unclear if/how shifts of effort resulting from the closures would affect herring fishing in the open areas. Any short-term benefits to the resource that may result from decreasing seasonal concentrations of fishing effort, therefore, are likely small and difficult to quantify. In addition, other fishing activity is likely to continue in the Protection Areas even if herring fishing is prohibited.

Option 2 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the closures would not apply to the proposed protection areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached. Because the potential benefit of short-term closures under Alternative 3 cannot be measured/quantified and are likely to be small since other fishing will continue in the areas, a greater long-term benefit for the Atlantic herring resource may come from enhanced herring fishery data (any of the options under Alternative 2). Overall, the impacts of Alternative 3 in comparison to Alternative 1 (no action) on the herring resource are therefore likely to be *neutral*. This determination applies to both Options 1 and 2 under Alternative 3. Exemptions under consideration for the Northern shrimp fishery and large-mesh

groundfish fishery should not affect this determination with respect to impacts on the Atlantic herring resource.

6.4.3 Impacts on Non-Target Species and Other Fisheries

6.4.3.1 Coincidence of River Herring and Shad

A detailed analysis of the overlap of river herring and shad is provided in Appendix VI of this document (Volume II). Based on this analysis, the Herring PDT concluded that management measures implemented to address river herring bycatch in the Atlantic herring fishery would likely have similar impacts on shad. For the purposes of this assessment, American shad (*Alosa sapidissima*) and hickory shad (*Alosa mediocris*) were grouped together as "shad" and alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) were grouped together as "river herring."

To evaluate the coincidence of shad and river herring in bycatch from the Atlantic herring fishery, bycatch estimates from NEFOP observed trips that landed over 2000 pounds of Atlantic herring from 2005 to 2009 were examined by the Herring PDT. Of the 1,099 individual hauls that were observed, 287 (26%) encountered river herring and 102 (9%) encountered shad. Almost two-thirds of the hauls that caught shad also caught river herring, and over 80% of the shad catch came from hauls that also caught river herring. The level of coincidence between the two species groups is even greater when the spatial distribution of bycatch events is considered. Only 4% of the ten-minute squares with observed tows had shad bycatch and no river herring bycatch (see data and figures in Appendix VI, Volume II). Furthermore, the shad caught from those areas only account for 1% of the total shad bycatch. Therefore, it appears reasonable to conclude that management actions designed to protect river herring will likely also protect shad.

6.4.3.2 Summary of River Herring At-Sea Migratory Patterns

In general, river herring at-sea seasonal migratory patterns are reflected using the Herring PDT's hotspot analysis of survey data. Table 157 summarizes the results of the river herring hotspot analysis to identify survey-based areas. River herring travel from southern to northern latitudes from winter through fall, presumably due to temperature fluctuations and timing of in-river spawning, then returning to southern latitudes to overwinter. River herring were relatively more likely to be encountered in the winter in Southern New England waters and the Northern Mid-Atlantic Bight and in the spring in the Gulf of Maine, Southern New England waters, and the Northern Mid-Atlantic Bight. In addition, the winter survey did not operate in the more northern latitudes and the summer survey provided a limited number of observation years. Additional information/analyses provided by the Herring PDT can be found in Volume II, Appendix IV (Herring PDT Analysis: Development of Measures to Address River Herring Bycatch).

Table 157 Summary of Seasonal River Herring Hotspot Analysis Using NMFS Bottom Trawl Surveys

For each identified season and region combination, the relative likelihood of encountering river herring is summarized by shading in the table (see footnotes).

	Season			
Region	Winter	Spring	Summer	Fall
Scotian Shelf	*		*	
Bay of Fundy	*		*	
Gulf of Maine	*			
Georges Bank				
Southern New England				
Northern Mid-Atlantic Bight				

"*" indicates limited data

Relative likelihood of encountering river herring in hotspots scaled using ranked percent occurrence:

> or = 67% (dark gray), < 67% (light gray), and mixed results (medium gray)

6.4.3.3 Impacts of Alternative 1 (No Action Alternative) on Non-Target Species and Other Fisheries

The non-target species most pertinent to this amendment are described in detail in Section 5.2 of this document (Affected Environment). Under Alternative 1, no additional management measures would be implemented in Amendment 5 specifically to address river herring bycatch. Some of the measures under consideration to address river herring bycatch may have positive impacts on non-targets species and other fisheries, including river herring, through increased monitoring and data collection, or through reductions in fishing effort in some times/areas. These benefits would not be realized under Alternative 1.

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 stock assessment technical team examined indices from fishery-dependent (directed river herring landings and bycatch estimates in ocean fisheries) and fishery-independent (young-of-year indices, adult net and electrofishing indices, coastal waters trawl surveys, and run count indices) datasets. From this information, the status of 23 stocks were determine 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 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.

The ASMFC managed directed river herring fishery is under a coastwide landings moratorium effective January 1, 2012. States with approved sustainable harvest plans have exemptions from the moratorium. These States include Maine, New Hampshire, New York, North Carolina, and South Carolina. NOAA considers both species, alewife and blueback herring, as species of concern and is reviewing whether they should be listed under the Endangered Species Act. The determination will be made later this year. The selection of the no action alternative in this case is not likely to be aligned with the coastwide moratorium and exemption process, however the measures in place under the ASMFC and States would continue for both shad and river herring if this no action alternative were selected. It is likely, however, that the increased monitoring and data collection benefits or reductions in fishing effort in some times/areas that may be realized under Alternatives 2 and 3 may not be realized for river herring under the no action alternative.

In the Atlantic mackerel fishery, the status of the resource is currently "unknown" with respect to both fishing mortality rates and stock size. The mackerel fishery, however, is managed through an overall ABC for what is currently an open access fishery, although a new limited access program is currently being developed. The selection of the no action alternative in this case is therefore not likely to affect removals from the fishery, as the current management measures in place under the MAFMC FMP would remain in place. It is likely, however, that the increased monitoring and data collection benefits or reductions in fishing effort in some times/areas that may be realized under Alternatives 2 and 3 may not be realized for Atlantic mackerel under the no action alternative.

Of the 19 groundfish stocks that are managed under the Northeast Multispecies Fishery FMP, 13 of the stocks were overfished, and 11 of the stocks were overfished and experiencing overfishing. None of these groundfish stocks are likely to be effected by the no action alternative, however, because there are already measures under the Northeast Multispecies Fishery FMP to address these issues, and by taking no action, the measures currently in place would continue. Both Georges Bank and Gulf of Maine haddock were not overfished, and overfishing was not occurring, however. For the haddock stocks and others that were not considered overfished or in which overfishing was not occurring, it is also likely that the no action alternative would not have an effect on the species, because measures are in place to prevent these stocks from becoming overfished, or stocks in which overfishing is occurring under the Northeast Multispecies Fishery FMP. It is likely, however, that the increased monitoring and data collection benefits or reductions in fishing effort in some times/areas that may be realized under Alternatives 2 and 3 may not be realized for multispecies under the no action alternative.

It is likely, with all the non-target species and other fisheries mentioned above, that the impact of the no action alternative will be *neutral* because no additional impacts would be expected under status quo conditions. However, Alternative 2 would likely offer the benefits of increased monitoring and data collection for non-target species, and therefore likely offer an overall positive benefit to the resources in comparison to the no action alternative. Alternative 3 would offer the benefit of reductions in fishing effort in some times/areas, which may offer an overall positive benefit to the resources in comparison to the no action alternative. The no action alternative, however, will retain the measures in place to maintain the non-target species and other fisheries, and not realize the benefits of Alternative 2 and/or 3 for non-target species and other fisheries.

6.4.3.4 Impacts of Alternative 2 (River Herring Monitoring/Avoidance) on Non-Target Species and Other Fisheries

Detailed analyses related to the development of the management measures to address river herring bycatch can be found in Appendix IV of this document (Volume II) and should be referenced for additional technical and supporting information.

To develop and evaluate the proposed areas, the Herring PDT constructed a model of river herring distribution at sea using two indicators: percent occurrence and presence above a threshold level of river herring using NEFSC trawl surveys form the 1960s to 2009. These surveys provide snapshots of river herring distribution at sea. The analysis revealed that in general river herring are widely distributed across the US continental shelf during the spring, but their range is truncated in the fall to the Gulf of Maine. Analysis of the winter survey showed that river herring overwinter south of Cape Cod, however the winter survey did not survey in the Gulf of Maine. The Herring PDT compared this to NEFOP observed location of recent catch (2005-2009) of river herring by the Atlantic herring fishery and found similar patterns.

As part of the analysis, river herring monitoring/avoidance areas options were compared to other areas identified using research surveys. The survey-based areas provide information on the times and areas were river herring are likely to be encountered absent information from the fishery. Additional information/analyses provided by the Herring PDT can be found in Volume II, Appendix III (Herring PDT Analysis: Development of Measures to Address River Herring Bycatch) and Appendix VI (Detailed Analysis of Impacts of Management Measures Under Consideration in Amendment 5 to Address River Herring Bycatch).

In Appendix VI (Volume II), Table 12 – Table 17 and associated Figure 29 – Figure 35 provide a comparison of the bimonthly river herring monitoring/avoidance areas to associated survey-based areas. The number of NEFOP observations used to identify each monitoring/avoidance area (fishery-based areas) are provided in Table 12 – Table 17. Further, the number of NMFS bottom-trawl surveys used to identify survey-based areas are found within hatched areas in Figure 29 – Figure 35. Several questions were asked to qualitatively compare fishery-based and survey-based areas:

1) Are there any adjacent fishery-based areas?
2) Are there any adjacent survey-based areas?
3) Does the fishery-based area overlap a survey-based area?

Adjacency was defined as areas sharing a side and/or corner. The results of this analysis for each bimonthly period provide a qualitative evaluation of the proposed Monitoring/Avoidance Areas.

Spatial management options developed are similar to the areas identified by the survey-based analysis. However, there are many hotspot areas identified as important that are adjacent to the spatial management options. The risk is that future river herring migratory patterns and aggregations may change from recent patterns. For example if river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these areas may not detect these changes (monitoring/avoidance area) or provide adequate protection (protection areas).

Under any/all of the monitoring options under consideration in Alternative 2, the impacts of Alternative 2 on non-target species/other fisheries relative to Alternative 1 (no action) are likely to be *potentially positive*. Positive impacts are likely to result from increased catch monitoring in the fishery and an improved understanding of river herring encounters in the herring fishery; additional positive impacts could result if the fleet chooses to avoid these areas and river herring bycatch decreases. The selection of permit holders to which the river herring measures apply (A/B/C/D) may influence the scope of the impacts; a greater positive impact would likely result from incorporating more vessels into the monitoring/avoidance program, thereby collecting more information.

There is, however, some degree of uncertainty about the nature and extent of impacts expected under these options because the impacts are linked to variability associated with river herring distribution as well as any shifts in fishing effort that may result from the measures implemented in the Monitoring/Avoidance Areas (and the costs associated with fishing in these areas). Focused monitoring in these areas may improve bycatch information and enhance the ability to assess the impacts of interactions between the herring fishery and non-target species, but only if the areas encompass future distribution of the species as well as areas of seasonal concentrations of herring fishing effort. Based on the information presented in Section 6.4.6.5 of this document (Impacts on Fishery-Related Businesses and Communities – Options for Shrimp/Large-Mesh Fishery Exemptions) and uncertainty about effort/distribution shifts, it is unclear how exemptions under consideration for the Northern shrimp fishery and large-mesh groundfish fishery may affect non-target species and other fisheries, but the impacts of these exemptions under Alternative 2 is not likely to be significant because of the small component of the fishery that would be affected.

Options 1, 2, and 3

Options 1, 2, and 3 propose additional monitoring requirements in the Monitoring/Avoidance Areas. Option 1 would require 100% observer coverage in these areas; Option 2 would require the Closed Area I sampling provisions to apply to these areas; Option 3 would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area. Option 3 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the measures would not apply in the proposed Monitoring/Avoidance Areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached. As previously noted, many of the expected impacts have already been discussed/addressed in this document (see section references below). Moreover, it is important to acknowledge the additional impacts (positive and negative) that are likely to result from the overall management action proposed in Amendment 5.

- Option 1 (100% Observer Coverage) is proposed for Category A and B herring vessels in this amendment (Section 3.2.1.2). As an independent measure, the impacts on non-target species and other fisheries of implementing Option 1 in the River Herring Monitoring/Avoidance Areas are expected to be similar to those discussed in Section 6.2.3 (Impacts of Alternatives to Allocate Observer Coverage on Non-Target Species and Other Fisheries), but to a lesser degree, because the requirements would only apply on a seasonal basis in the River Herring Monitoring/Avoidance Areas (versus throughout the fishery). The impacts on non-target species and other fisheries may therefore be *potentially positive*.
- Option 2 (Closed Area I Provisions) is also being considered as a measure to address net slippage across the entire fishery (Section 3.2.3). As an independent measure, the impacts on non-target species and other fisheries of implementing Option 2 in the River Herring Monitoring/Avoidance Areas are expected to be similar to those discussed in Section 6.3.2.2.3 (Impacts of Measures to Address Net Slippage on Non-Target Species and Other Fisheries), but to a lesser degree, because the requirements would only apply on a seasonal basis in the River Herring Monitoring/Avoidance Areas

(versus throughout the fishery). The impacts on non-target species and other fisheries may therefore be *potentially positive*.

- Option 3 (Trigger-Based Monitoring/Avoidance) would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area. Option 3 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the measures would not apply in the areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached. Overall, the impacts on non-target species and other fisheries are still expected to be *potentially positive*, relative to taking no action.

River Herring

In general, establishing River Herring Monitoring/Avoidance Areas could improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring and could lead to possible reductions in river herring mortality if the fleet avoids these areas through the utilization of better information about bycatch. However, the monitoring options under Alternative 2 would likely result in no reduction on river herring mortality in the monitoring/avoidance areas, if the fleet chooses to fish in these areas. Additionally, specific areas monitored instead of across the full range of the species may miss important river herring encounters and influences river herring removals estimates. For example if river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these areas may not detect these changes (monitoring/avoidance area). Likewise, shifts in fishing effort potentially impact the quality of information collected on river herring and the mortality of river herring. For example, if fishing effort shifts in the future out of the proposed areas, impacts on river herring by the fishery could increase into the outside areas. Effort shifts resulting from the measures proposed in Alternative 2 are difficult to predict, and the impact of any effort shift on river herring bycatch and/or the river herring resource cannot be measured at this time.

Other Small Pelagic Species (Mackerel, Squid, Butterfish, Whiting, and Menhaden)

Increased monitoring may provide additional information on bycatch/discards of the other pelagic species. This, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. In addition when the mackerel fishery overlaps the Atlantic herring fishery in space and time and in these areas (e.g. Mid-Atlantic in winter), additional information on bycatch/discards will be gained from these vessels fishing for both target species.

Groundfish Species

Increased monitoring may provide additional information on bycatch/discards of the groundfish species, including haddock. This, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. For example, increased monitoring in areas that overlap the haddock sub-stock catch cap monitoring areas (Framework 46, Groundfish FMP) could provide more information on haddock discards.

Option 4: Two-Phase Bycatch Avoidance Strategy (Preferred Alternative)

Under this option, areas with relatively high river herring encounters would be avoided (by time or distance) when river herring are encountered at some threshold level determined by the industry in cooperation with the research partners. The details of this option are currently under development and await results from the SFC/SMAST/MADMF pilot project. If the pilot is successful at developing at-sea river herring avoidance protocols for the Atlantic herring fleet, there could be reductions in river herring mortality in the bimonthly Monitoring/Avoidance Areas. Additionally, there would need to be adequate incentives in place for the fleet to avoid the areas. The impacts of this option on non-target species and other fisheries, therefore, is *potentially positive*.

However, an avoidance strategy linked to specific bimonthly avoidance areas (i.e. not implemented throughout the spatial and temporal extent of the Atlantic herring fishery), could miss river herring encounters in adjacent areas, as demonstrated by the survey-based areas (additional areas of likely river herring encounter). Such an approach would not reduce river herring mortality outside of Monitoring/Avoidance Areas. Furthermore, areas outside avoidance areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year river herring variability. Therefore, if the fleet is successful at developing at-sea protocols to avoid river herring inside the avoidance areas, modification of these protocols across the entire range of river herring should be considered during Phase II.

6.4.3.5 Impacts of Alternative 3 (River Herring Protection) on Non-Target Species and Other Fisheries

Alternative 3 proposes to establish River Herring Protection Areas, seasonally (bimonthly) areas closed to herring fishing to some/all herring vessels. Options 1 and 2 are similar; under Option 2, the closed areas would become effective after a river herring catch trigger is reached in a particular area and may have slightly less benefit depending on when/where the trigger is reached. The potential benefit of the bimonthly protection areas is that they provide river herring mortality protection during at-sea migrations by closing specific river herring fishery-based encounter hotspots. Such an approach could lead to reductions in at-sea river herring mortality. Relative to the no action alternative (Alternative 1), the impact of Alternative 3 (Options 1 and 2) on non-target species and other fisheries is *potentially positive*.

Based on the information presented in Section 6.4.6.5 of this document (Impacts on Fishery-Related Businesses and Communities – Options for Shrimp/Large-Mesh Fishery Exemptions) and uncertainty about effort/distribution shifts (discussed under Alternative 2 and below as well), it is unclear how exemptions under consideration for the Northern shrimp fishery and large-mesh groundfish fishery may affect non-target species and other fisheries, but the impacts of these exemptions under Alternative 3 is not likely to be significant because of the small component of the fishery that would be affected.

In Appendix VI (Volume II), Table 31 – Table 34 and associated Figure 55 – Figure 58 provide a comparison of the bimonthly river herring protection areas to associated survey-based areas. The number of NEFOP observations used to identify each monitoring/avoidance area (fishery-based areas) are provided in Table 31 – Table 34. Further, the number of NMFS bottom-trawl surveys used to identify survey-based areas are found within hatched areas in Figure 55 – Figure 58. Several questions were asked to qualitatively compare fishery-based and survey-based areas:

1) Are there any adjacent fishery-based areas?
2) Are there any adjacent survey-based areas?
3) Does the fishery-based area overlap a survey-based area?

Adjacency was defined as areas sharing a side and/or corner. The results of this analysis for each bimonthly period provide a qualitative evaluation of the proposed Protection Areas.

Spatial management options developed are similar to the areas identified by the survey-based analysis. However, there are many hotspot areas identified as important that are adjacent to the spatial management options. The risk is that future river herring migratory patterns and aggregations may change from recent patterns. For example if river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these areas may not detect these changes (monitoring/avoidance area) or provide adequate protection (protection areas). With fixed bimonthly Protection Areas, information about catch/bycatch in the herring fishery would not be collected in the areas, nor would there be river herring mortality protection outside of proposed Protection Areas. Therefore, areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect river herring year-to-year variability. If fishing effort shifts because of the seasonal closures, encounters of river herring in the fishery may change from previous observations; the impact of effort shifts cannot be predicted. If river herring distribution centers and/or aggregations shift (e.g. northward due to changing environmental conditions) in the future, these protection areas may not provide positive benefits for river herring unless the areas encapsulate these potential changes in patterns. Likewise, triggered protection areas might not be put in place quickly enough to be at the pace with river herring migratory patterns.

Other Small Pelagic Species (Mackerel, Squid, Butterfish, Whiting, and Menhaden)

Protection areas may provide mortality reductions for other pelagic species. This, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. If fishing effort shifts because of the seasonal closures, encounters of these species in the herring fishery may change from previous observations; the impact of effort shifts cannot be predicted. In addition, many of the other small pelagic species (mackerel, squid, whiting) are managed similarly to Atlantic herring, through an annual catch limit (ACL, reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) designed to prevent overfishing, and accountability measures (AMs) designed to prevent ACLs from being exceeded. Due to the ongoing management of these fisheries through ACLs/AMs, bimonthly closures under Alternative 3 may have little impact on the managed species.

Groundfish Species

Protection areas may provide mortality reductions for groundfish species, including haddock. This, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. For example, protection areas overlapping the haddock sub-stock catch cap areas (FW 46, Groundfish FMP) could reduce haddock mortality and alter monitoring of the haddock catch cap by displacing fishing effort into adjacent areas. If fishing effort shifts because of the seasonal closures, encounters of these species in the herring fishery may change from previous observations; the impact of effort shifts cannot be predicted.

In addition, groundfish stocks are managed through ACLs (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) designed to prevent overfishing, and AMs designed to prevent ACLs from being exceeded. Due to the ongoing management of the multispecies fishery through ACLs/AMs, bimonthly closures under Alternative 3 may have little impact on groundfish species.

6.4.3.6 Summary of Impacts on Non-Target Species and Other Fisheries

Table 158 and Table 159 generally summarize the impacts of the measures proposed to address river herring bycatch on Non-Target Species and Other Fisheries. The tables provide a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration with respect to non-target species and other fisheries. Relative to taking no action, Alternative 2 and Alternative 3 will potentially result in positive impacts on non-target species and other fisheries, particularly river herring, as these measures were developed specifically to address river herring bycatch. However, while impacts are potentially positive under both alternatives, the nature and extent of impacts relies heavily on shifts in both the distribution of the non-target species and the vessels that are affected/displaced by the measures proposed in either Alternative 2 or Alternative 3. These uncertainties are reflected in the trade-offs discussed in Table 158 and Table 159.

Table 158 Biological – River Herring-Focused Trade-offs of Spatial Management Approaches

	Biological- River Herring	
Possible Measure	**Positive Impacts**	**Negative Impacts**
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3) Obs. Coverage/CA I Sampling	Areas improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring. Possible reductions in river herring mortality if fleet avoids the areas.	No impact on river herring mortality, unless the fishery chooses to stay out of monitoring areas. Specific areas monitored instead of across the full range of the species misses important river herring encounters and influences river herring removals estimates.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4) Two-Phase Avoidance Program	Areas with relatively high river herring encounters are avoided (by time or distance) when river herring are encountered at some threshold level. Likely reductions in river herring mortality.	No river herring mortality protection outside of avoidance areas. Areas outside avoidance areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year variability.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1) Closed Areas	Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots. Likely reductions in river herring mortality.	No river herring mortality protection outside of protection areas. Areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year variability.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2) Trigger-Based Closures	Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots upon reaching a trigger. Possible reductions in river herring mortality.	No river herring mortality protection outside of trigger areas. Trigger areas are not put in place quickly enough to be at the pace with river herring migratory patterns.

**This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The **Preferred Alternative** in Amendment 5 is represented by the shaded row above.*

Table 159 Biological – Other Small Pelagics-Focused Trade-offs of Spatial Management Approaches

	Other Small Pelagic- American and Hickory Shad, Mackerel, Herring, Squid, Butterfish, Whiting, Menhaden	
Possible Measure	**Positive Impacts**	**Negative Impacts**
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3) Obs. Coverage/CA I Sampling	Increased monitoring can provide additional information on bycatch/discards of other non-target species	Dependent on individual species life history and migratory patterns.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4) Two-Phase Avoidance Program	Areas with co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are avoided (by time or distance) when river herring are encountered at some threshold level. Possible reductions in American and hickory shad mortality, high rate of co-occurrence with river herring in NEFOP data for Atlantic herring fishery.	Dependent on individual species life history and migratory patterns.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1) Closed Areas	Areas might provide mortality protection for co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are protected by closing specific river herring encounter hotspots. Likely reductions in American and hickory shad mortality, due to high rate of co-occurrence with river herring encounters in NEFOP data for Atlantic herring fishery.	Dependent on individual species life history and migratory patterns.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2) Trigger-Based Closures	Areas might provide mortality protection for co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are protected by closing specific river herring encounter hotspots upon reaching a trigger. Possible reductions in American and hickory shad mortality, due to high rate of co-occurrence with river herring encounters in NEFOP data for Atlantic herring fishery.	Dependent on individual species life history and migratory patterns.

**This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The **Preferred Alternative** in Amendment 5 is represented by the shaded row above.*

6.4.4 Impacts on Physical Environment and EFH

6.4.4.1 Impacts of Alternative 1 (No Action Alternative) on Physical Environment and EFH

Under Alternative 1, no additional management measures would be implemented in Amendment 5 to address river herring bycatch. Since this alternative represents the status quo, no changes in the impacts on seabed habitats are expected. Specifically, adverse effects on EFH that result from the herring fishery are estimated to be minimal and temporary, and would continue to be minimal and temporary if this alternative is selected.

6.4.4.2 Impacts of Alternative 2 (Preferred Alternative – River Herring Monitoring/Avoidance) on Physical Environment and EFH

Alternative 2 would implement enhanced monitoring requirements (options 1-3) or avoidance requirements (option 4) for river herring in specified River Herring Monitoring/Avoidance Areas. The enhanced monitoring requirements are not expected to result in any additional impacts to seabed habitats/EFH, in comparison to the no action alternative. The avoidance requirements proposed as part of Option 4 (***Preferred Alternative***) could result in spatial shifts in herring fishing effort, but changes are difficult to predict. Because seabed contact by midwater trawl gear is rare, it is assumed that herring fishery adverse effects on EFH will continue to be minimal and temporary if monitoring and avoidance areas are implemented. The impacts, therefore, are expected to be *neutral*.

6.4.4.3 Impacts of Alternative 3 (River Herring Protection) on Physical Environment and EFH

Alternative 3 would implement River Herring Protection Areas, which would be closed to the directed herring fishery on either a predetermined seasonal basis (specific, relatively small areas associated with specific months), or on a catch-trigger basis (with larger, more general areas subject to trigger controls on a year round basis). Predetermined seasonal closures could influence spatial patterns of fishing effort, but changes are difficult to predict. Because seabed contact by midwater trawl gear is rare, it is assumed that herring fishery adverse effects on EFH will continue to be minimal and temporary if monitoring and avoidance areas are implemented. If catch triggers were exceeded, the catch trigger options could also influence the spatial patterns of fishing effort. A shift in fishing that results in increased effort on Georges Bank during herring spawning (Sept-Nov) might lead to an increase in seabed gear contact, and thus an increase in adverse effects to EFH, because herring are near the seafloor during this time. However, it is likely that vessels would continue to fish in other inshore areas that would remain open, rather than moving to Georges Bank during the herring spawning season. Triggers might not be exceeded in any given area and year, however, resulting in no change in patterns of fishing. The overall impacts of Alternative 3 are therefore unknown at this time.

6.4.5 Impacts on Protected Resources

6.4.5.1 Impacts of Alternative 1 (No Action Alternative) on Protected Resources

Under Alternative 1, no additional management measures would be implemented in Amendment 5 to address river herring bycatch. No additional impacts are expected on protected resources above the current status quo, as the management measures currently in place would be maintained. Alternative 2, Options 1, 2, and 3 all provide a the opportunity for more information collection when compared to this no action alternative, however Option 4 is likely to present no additional benefits. The impacts of Alternative 3, Option 1 are difficult to predict at this time so the comparison to this No Action alternative is difficult to make, however Option 2 would present a low positive.

6.4.5.2 Impacts of Alternative 2 (Preferred Alternative – River Herring Monitoring/Avoidance) on Protected Resources

Options 1, 2, and 3

As previously noted, many of the expected impacts have already been discussed/addressed in this document. Moreover, it is important to acknowledge the additional impacts (positive and negative) that are likely to result from the overall management action proposed in Amendment 5. These options have the potential to have a low positive impact on protected resources through the collection of more information during encounters by the herring fishery (in comparison to Alternative 1, the No Action alternative). This information could, in turn, help with the better understanding of protected resources and improve their chance of survival. Option 1 would provide more information than Options 2 and 3, however overall magnitude of the improvement of monitoring is not likely to be great, as it will only apply in specific river herring hotspots, as determined by the Council.

Option 4: Two-Phase Bycatch Avoidance Strategy (Preferred Alternative)

The details of Option 4 are still being developed in the joint project between SFC/SMAST/MADMF, however the overall concept of the project is to allow the herring fishery to avoid areas with relatively high river herring encounters when river herring have been encountered at some threshold level. This project will ensure that vessels move out of the hotspots during certain times, however the variability in when and where the fleet movement will be makes the effects of this measure on protected resources difficult to determine. While it is likely that the effort will shift by the small increments of river herring hotspots, it is unlikely that this shift will increase or decrease the overall effort or change the vessels likelihood of encountering protected species by moving the vessels in the small increments. Therefore Option 4, as a stand-alone, is likely to have a neutral impact on protected resources in comparison to the No Action Alternative and the other three Options (1, 2, and 3) described within Alternative 2.

6.4.5.3 Impacts of Alternative 3 (River Herring Protection) on Protected Resources

Option 1: Closed Areas

This option has the potential to provide a low positive impact for protected resources by reducing the chance of encounters, and therefore potential mortality, with the herring fleet. The impact of these closed areas are difficult to determine at this time, however, as they are small in size and scattered up and down the east coast, making the behavior of the fleet in reaction to the closed areas difficult to determine at this time. It is possible that the overall magnitude of the effort will not decrease, but rather be displaced to the outside of the closed areas. The impacts of this option are therefore unknown at this time; similar to Option 4 under Alternative 2 (River Herring Monitoring/Avoidance), this option would provide areas of safety for protected species, but may not deter the overall effort and therefore the overall probability of a herring vessel encountering a protected species. Therefore, the overall impact of Option 1 is unknown.

Option 2: Trigger-Based Protection Areas

Under Alternative 3, all the benefits described in Option 1 (closed areas) would extend to Option 2 (trigger-based closed areas), however the magnitude of the benefits would be decreased under Option 2, because the areas would only be closed when triggered. Therefore, the overall impact of Option 2 is also unknown.

6.4.6 Impacts on Fishery-Related Businesses and Communities

6.4.6.1 Impacts of Alternative 1 (No Action Alternative) on Fishery-Related Businesses and Communities

Under Alternative 1, no additional management measures would be implemented in Amendment 5 specifically to address river herring bycatch. Herring businesses and dependent communities would likely not be affected, as the management measures in place that govern the herring fishery would remain intact. The potential (negative) impacts described below that affect herring fishery participants would not arise under Alternative 1 (no action alternative), but if no action is taken, any businesses that rely on the river herring, whether through a directed fishery, or indirectly as companies that rely on herring as forage, would not gain the potential benefits they anticipate with river herring protection.

6.4.6.2 Impacts of Alternative 2 (River Herring Monitoring/Avoidance) on Fishery-Related Businesses and Communities

Alternative 2 is the ***Preferred Alternative*** in Amendment 5. It proposes to establish River Herring Monitoring/Avoidance Areas and includes options for implementing additional catch monitoring provisions in those areas. Options 1, 2, and 3 propose additional monitoring requirements in the Monitoring/Avoidance Areas. Option 4, the ***Preferred Alternative***, implements a two-phase river herring bycatch avoidance strategy based on increased monitoring in the River Herring Monitoring/Avoidance Areas, combined with follow-up from an ongoing industry-based bycatch avoidance program, and a future Council action to establish river herring catch caps (identified by the Council as a management priority for 2013).

Options 1, 2, and 3 under Alternative 2 propose additional monitoring requirements in the River Herring Monitoring/Avoidance Areas. While these options do not represent the Council's ***Preferred Alternative*** for measures to address river herring bycatch, most of the measures proposed within these options are also proposed to be implemented across the limited access herring fishery as part of the catch monitoring program in Amendment 5. Therefore, many of the expected impacts have already been discussed/addressed in this document (see section references below). Moreover, it is important to acknowledge the additional impacts (positive and negative) that are likely to result from the overall management action proposed in Amendment 5. The impacts of the measures to address river herring, for example, may include not only those resulting from the ***Preferred Alternative*** in this section, but also from the catch monitoring program.

Option 1 would require 100% observer coverage in the river herring Monitoring/Avoidance and/or Protection Areas; Option 2 would require the Closed Area I sampling provisions to apply to these areas; Option 3 would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area.

- While Option 1 (100% Observer Coverage) is not the ***Preferred Alternative*** in this section, 100% observer coverage is proposed for Category A and B herring vessels as part of the catch monitoring program in this amendment (Section 3.2.1.2), which addresses the vast majority of the herring fleet. Additionally, the Council is proposing not to authorize waivers for observer coverage in areas associated with measures to avoid or protect river herring. The impacts of implementing Option 1 in the River Herring Monitoring/Avoidance Areas are therefore expected to be similar to those discussed

under the ***Preferred Alternative*** in Section 6.2 (Impacts of Alternatives to Allocate Observer Coverage).

- Option 2 (Closed Area I Provisions) is also proposed in Amendment 5 as a management measure to address net slippage across the entire limited access herring fishery (Section 3.2.3). The impacts of implementing Option 2 in the River Herring Monitoring/Avoidance Areas are expected to be similar to those discussed under the ***Preferred Alternative*** in Section 6.3.2.2 (Impacts of Measures to Address Net Slippage).
- Option 3 (Trigger-Based Monitoring/Avoidance – *not preferred*) would implement either Option 1 or Option 2 when a specified river herring catch trigger is reached in a particular area. Option 3 delays implementation of these measures until a catch trigger is reached and may have slightly less benefit because the measures would not apply in the areas throughout the entire fishing year, but the difference in terms of the impacts will depend on where/when the trigger is reached.

Relative to the no action alternative, Alternative 2 is expected to have a *negative* impact on fishery-related businesses and communities due to the costs associated with increased monitoring. The ***Preferred Alternative*** proposes Option 4 in the River Herring Monitoring/Avoidance Areas, which is likely to minimize the overall negative impacts of this alternative (see following discussion). In addition, the extent of the impacts will depend, in part, on the availability of Federal funding for observer coverage in the proposed River Herring Monitoring/Avoidance Areas (see Section 6.2 of this document for more discussion regarding the impacts of the proposed observer coverage requirements).

- Option 1, requiring 100% observer coverage in the Monitoring/Avoidance Areas, would likely have the largest negative impact on fishery-related businesses and communities, especially if the industry is required to pay for some or all observer coverage. The funding provisions proposed in this amendment relate to the alternatives to allocate observer coverage on limited access herring vessels. If an industry-funded program is utilized to pay for observer coverage in the River Herring Monitoring/Avoidance Areas under this option, the extent of impacts would depend on how many vessels are affected by this requirement.
- Option 2 could have a similar negative impact as Option 1 if the sub-option for 100% observer coverage is selected. The impact is lessened under the sub-option for less than 100% observer coverage because it is assumed that this sub-option would not result in a need for additional funding of observer days by the industry.
- Option 3 implements either Options 1 or 2 after a catch trigger is reached and would therefore have less impact on fishery-related businesses and communities because the additional monitoring requirements would not become effective until the catch trigger is reached; if the catch trigger is not reached in any area during the fishing year, then no additional monitoring requirements would be applied to the Monitoring/Avoidance Areas. The sub-options for specifying the river herring catch trigger may affect the timing of implementation of any additional measures (i.e., the higher the catch trigger, the less likely it is to be reached – see analyses provided in Appendix VI, Volume II).
- Option 4 (***Preferred Alternative***) represents an approach that builds from some industry-based initiatives and has potential to minimize adverse effects on fishery-related businesses and communities.

Details related to the specific impacts of each option under Alternative 2 on fishery-related businesses and communities are discussed in the following pages.

Option 1: 100% Observer Coverage

Alternative 2, Option 1 requires 100% observer coverage for some/all vessels on declared herring trips in the identified River Herring Monitoring/Avoidance Areas. This requirement is already proposed for Category A and B vessels, but under this option, Category C vessels would also be subject to the requirement when fishing in the River Herring Monitoring/Avoidance Areas. The economic impacts on fishery-related businesses and communities depends on the funding options for observer coverage. If these businesses are not required to pay for observer coverage, then the impact of these options are neutral. If observer coverage is paid for by the fishing industry, then these options will have a *negative* impact on the fishing-related businesses by increasing costs.

If observer coverage is unaffordable for a subset of vessels, this option may lead to lower revenues for vessels whose owners choose to forego trips. Some negative impacts could be mitigated by exempting the shrimp and large-mesh bottom trawl fisheries (see Section 6.4.6.5 for more information about these fisheries), but the boats most likely to benefit from these exemptions are smaller boats with Category C vessels that fish primarily inshore. Finally, because vessels are prohibited from fishing in the River Herring Monitoring/Avoidance Areas without a NMFS-approved observer on board, Option 1A and 1B may negative impacts on operational flexibility if a NMFS-approved observer is un available.

Option 1A requires 100% observer coverage for A/B/C vessels when on a declared herring trip. The impact on fishing vessels is treated separately by gear and permit category to provide insight into the differential impacts of these options on various gear and permit categories. Table 164 – Table 171 summarize the fishing effort, herring revenues, herring landings, and total revenues which were located in the monitoring options. Approximately 6% of the purse seine (all permit categories) effort, catch, and revenues are derived from the monitoring areas. Therefore, the impacts on the purse seine fleet are expected to be neutral or slightly negative if the industry funds the observer coverage. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas. This option may also affect vessels targeting other species such as mackerel or squid while on declared herring trips. Therefore, the impact of this option is characterized as negative if the industry funds the observer coverage.

Table 162 describes the total number of trips and number of observer-days required to meet this coverage if this option had been active in 2010. In 2010, 343 trips (51.7% of total trips) entered the monitoring areas. 974 observer-days would have been required under Option 1A if this option had been in place during 2010.

In order to place the costs of industry-funded observers into context, Table 160 summarizes average revenues per trip, average revenues per day absent, operating costs per trip, and operating costs per day absent, classified by gear type for 2008-2010. Revenues were calculated using the VTR and Dealer data while operating costs were based on data collected through the observer program. Operating costs in this fishery are primarily fuel expenses; the price of fuel has fluctuated (along with the price of crude oil) over the past three years.

Table 160 2008-2010 Average Revenues, Costs Per Day and Average Revenues, Costs Per Trip for Category A/B/C Herring Vessels

	Revenue/Day	Revenue/Trip	Operating Costs/Day	Operating Costs/Trip
Single Midwater Trawl	$12,853	$41,721	$4,271	$12,608
Pair Trawl	$15,683	$43,166	$3,295	$9,372
Purse Seine	$18,557	$25,499	$1,798	$2,746
Bottom Trawl	$5,325	$7,863	$785	$524

Revenue Data is from VTR and Dealer (n=5,329)
Operating Costs data is from Observer (n=352)

Relative to the daily operating costs for the fishery, the cost of an observer is fairly high. For example, a NEFOP observer would increase the per-day costs of bottom trawl, single midwater trawl, pair trawl, and purse seine by 153%, 28%, 36%, and 67% respectively (Table 161). However, relative to daily revenues, the cost of an observer is lower; an observer would cost 22%, 9%, 9%, and 6% of average daily revenues for the bottom, midwater, pair trawl, and purse seine vessels. These numbers are presented for illustration; it is possible that the type of data required in this fishery would result in higher or lower per-day costs than described in Table 160.

Table 161 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs

	Revenue	Costs
Single Midwater Trawl	9.3%	28.1%
Pair Trawl	7.7%	36.4%
Purse Seine	6.5%	66.7%
Bottom Trawl	22.5%	152.8%

Option 1B requires 100% observer coverage for A/B/C and Category D (open access) vessels when on a declared herring trip. Table 164 – Table 171 summarize the fishing effort, herring revenues, herring landings, and total revenues which were located in the monitoring options. The impacts of this measure are similar to Option 1A. Table 163 describes the total number of trips and number of observer-days required to meet this coverage if this option had been active in 2010. In 2010, 356 trips (50.3% of total trips) entered the proposed monitoring areas. 987 observer-days would have been required under Option 1B if this option had been effective during 2010.

Category C and Category D Vessels

The potential costs of monitoring the Category C herring vessels is discussed in Section 6.2.6.3 of this document (100% observer coverage for the limited access herring fishery). As the analysis indicates, incorporating Category C vessels may increase costs significantly, especially if observers are required on all trips for C vessels. Table 49 (p. 249) shows that over 2,000 vessels currently possess Category D (open access) permits. Requiring these vessels to carry an observer on board in the River Herring Monitoring/Avoidance Areas would again significantly increase costs because of the sheer number of vessels and trips that would be required to have an observer on board. It is possible, and likely for many. that Category D vessels would either relinquish their herring permit or fish in other areas during the restrictions in the bimonthly Monitoring/Avoidance Areas if they would be required to pay for an observer.

In general, the affected trips and required coverage for 100% observer coverage are the same as in Option 1 (see Table 162). Beyond additional coverage, vessels will incur additional regulatory costs related to filing out Released catch Affidavits. Note that the requirement to exit the area is creates a disincentive to safety-at-sea.

Option 2A

The impacts of this option are similar to the previous option and depend largely on who is responsible for covering the costs of additional observer coverage.

Option 2B

The impacts of Option 2B are similar to that of 2A, except vessel have the flexibility to fish in the monitoring areas if an observer is unavailable.

Option 2C

The impacts of Option 2C are similar to the impacts of 1A. However, vessels may choose not to declare that they are on a herring trip, and be able to use the monitoring areas without a monitor.

Option 2D

The impacts of Option 2D are similar to the impacts of 1B. However, vessels may choose not to declare that they are on a herring trip, and be able to fish for other species in the monitoring areas without a monitor.

Table 162 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1A, if This Option had been Effective in 2010

Gear (ABC permits only)	Trips in Monitoring Areas	Percentage of total Trips	Days of Coverage Required
Trawl	298	64.6%	874
Purse Seine	45	22.3%	100
Total	343	51.7%	974

Table 163 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1B, if This Option had been Effective in 2010

Gear (ABCD permits)	Trips in Monitoring Areas	Percentage of total Trips	Days of Coverage Required
Trawl	311	61.5%	887
Purse Seine	45	22.3%	100
Total	356	50.3%	987

Table 164 Fishing Time (Hours) Inside and Outside the Monitoring Areas

		Fishing Time		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		2,617	330	2,947
TR	ABC	6,699	5,406	12,105
	D	227	71	298
Grand Total		9,544	5,807	15,351

Table 165 Fishing Time (%) Inside and Outside the Monitoring Areas

		Fishing Time (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		88.8%	11.2%	100.0%
TR	ABC	55.3%	44.7%	100.0%
	D	76.3%	23.7%	100.0%
Grand Total		62.2%	37.8%	100.0%

Table 166 Herring Catch (lbs.) Inside and Outside the Monitoring Areas

		Herring Catch		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		17,434,005	1,028,536	18,462,541
TR	ABC	67,237,466	56,866,383	124,103,849
	D	112,799	36,045	148,844
Grand Total		84,784,270	57,930,964	142,715,233

Table 167 Herring Catch (%) Inside and Outside the Monitoring Areas

		Herring Catch (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.4%	5.6%	100.0%
TR	ABC	54.2%	45.8%	100.0%
	D	75.8%	24.2%	100.0%
Grand Total		59.4%	40.6%	100.0%

Table 168 Herring Revenue ($) Inside and Outside the Monitoring Areas

		Herring Revenue		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		$2,783,152	$174,925	$2,958,078
TR	ABC	$9,270,814	$6,349,882	$15,620,696
	D	$18,792	$5,645	$24,437
Grand Total		12,072,759	6,530,452	18,603,211

Table 169 Herring Revenue (%) Inside and Outside the Monitoring Areas

		Herring Revenue (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.1%	5.9%	100.0%
TR	ABC	59.3%	40.7%	100.0%
	D	76.9%	23.1%	100.0%
Grand Total		64.9%	35.1%	100.0%

Table 170 Total Revenue ($) Inside and Outside the Monitoring Areas

		Total Revenue		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		$2,783,201	$174,928	$2,958,129
TR	ABC	$10,100,712	$7,992,356	$18,093,067
	D	$33,329	$9,683	$43,011
Grand Total		12917241.89	8176965.79	21094207.68

Table 171 Total Revenue (%) Inside and Outside the Monitoring Areas

		Total Revenue (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.1%	5.9%	100.0%
TR	ABC	55.8%	44.2%	100.0%
	D	77.5%	22.5%	100.0%
Grand Total		61.2%	38.8%	100.0%

Category A/B Versus Category C and Category D Vessels

As discussed throughout this document, there are costs associated with incorporating a greater number of vessels into a comprehensive monitoring program, especially if there is an industry-funded element of the monitoring program. The goals and objectives of the monitoring program should be weighed against the costs of monitoring to the vessels and the degree of participation in the fishery.

To further investigate differential impacts by herring permit category, herring catch and revenues from these vessels inside and outside the proposed monitoring areas are summarized by permit category in Table 172. While 22-24% of the Category D effort, catch, and revenues are derived from the monitoring areas, the magnitude of effort, catch, and revenues attributable to Category D vessels is minimal. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas. Table 172 shows the potential impact of the monitoring areas on Category C vessels and the other fisheries on which they rely. While Category A vessels will be most affected because they catch the majority of herring, Category C vessels derive about 20% of their total revenues from all fisheries from the proposed monitoring areas. Should the monitoring measures become too costly for the Category C vessels to fish in these areas, they will likely lose revenues from other fisheries where herring may be caught incidentally.

Table 172 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Monitoring Areas by Limited Access Herring Permit Category

Permit Cat.	No. Vessels	Inside/ Outside	Days Fished	Herring Catch (millions pounds)	Herring Revenue (millions dollars)	Total Revenue (millions dollars)
A	27	Outside	441	100.38	$13.77	$14.76
A	22	Inside	148	39.17	$4.36	$5.81
B	2	Outside	Cannot report	Cannot report	Cannot report	Cannot report
B	3	Inside	15	1.56	$0.17	$0.17
C	3	Outside	16	0.96	$0.23	$0.25
C	5	Inside	7	0.44	$0.04	$0.06
D	6	Outside	9	0.11	$0.02	$0.03
D	5	Inside	3	0.04	$0.01	$0.01

Option 2: Closed Area I Sampling Provisions

Option 2 proposes to implement Closed Area I sampling provisions in the River Herring Monitoring/Avoidance Areas on any trip with an observer on board (for some/all herring vessels depending on which permit categories are identified). While the original provisions appear to have been feasible from a sampling and logistical perspective, the new provisions to require operational discards to be brought on board have not been practiced yet because the fleet has not yet moved into the area around Closed Area I yet at the time of the Amendment 5 DEIS/FEIS preparation. There may be some new challenges associated with bringing operational discards on board for some vessels. In addition, the effect of these provisions on purse seine operations is unclear because only trawl vessels fish in Closed Area I. The operation of the purse seine fishery is substantially different than that of the trawl fishery, and consideration must be given to the size of the vessels, nature of the fishery, and practical and safety implications of bringing the net on board to ensure that all operational discards come across the deck. However, similar provisions are proposed in this amendment for all limited access herring vessels (Measures to Address Net Slippage, Section 3.2.3.4) and would apply in the Monitoring/Avoidance areas.

The restrictions already placed on midwater and pair trawl operations (e.g., the seasonal Area 1A closure) generally disadvantage this part of the fishery. Whereas requiring the extreme sampling in Closed Area I might be considered reasonable to document any interaction with groundfish in an area where groundfishing is not permitted, requiring these provisions wherever herring vessels go could be considered an inequitable burden. Further, if only the midwater and pair trawl vessels are required to comply, this could have the appearance of unfairness.

As previously discussed in this document (Section 6.3.2.2, Impacts of Measures to Address Net Slippage), any economic impacts to the herring fishery are expected to be neutral to slightly negative. These impacts will be through increased time spent pumping fish aboard the vessel to be sampled and inspected by a NMFS-approved observer. The pecuniary impacts on the participants in herring fishery are expected to be minimal. The same impacts (neutral to slightly negative) are expected for participants that hold Atlantic herring permits and are targeting other species (mackerel, squid). The negative impacts on fishery-related businesses and communities resulting from Option 2 are likely to be less than those under Option 1 (100% observer coverage), assuming the industry would be required to pay for observer coverage under Option 1.

Option 3: Trigger-Based Monitoring

This options establishes triggers, based on catch of river herring in three broad areas (CC, GOM, and SNE in Figure 19). There are three sets of options under consideration to establish river herring catch triggers, based on Maximum, Median, and Mean river herring removals estimated by the Herring PDT.

Trigger-based monitoring and trigger-based closed areas use a technique understood by fisheries participants. Atlantic herring participants would likely limit fishing in the protection area if feasible, but if river herring were not encountered, fishing for Atlantic herring could continue. The negative impact of this measure is that the uncertainty associated with trigger mechanisms makes planning difficult. Moreover, the complexity proposed with catch reporting to monitor a river herring trigger in addition to a haddock catch cap (Framework 46) and herring catch by management area will likely increase the reporting burden and prove to be challenging for fishery participants to provide accurate catch information in a real-time manner.

The first stage in assessing the impact of Trigger-Based Monitoring is to estimate when the triggers are likely to be reached. Use of VTR only is problematic, because river herring catch may not be accurately recorded in VTR. Therefore, a simulation based approach which combines VTR and observer bycatch rates is used. The detailed analysis is provided in Appendix VII of this document (Volume II); results and potential impacts are summarized below. The fishing years and river herring catch are simulated under two observer coverage scenarios (100% coverage and 50% coverage) to provide insight into the effect that changes in the levels of observer coverage might have on the triggers being reached.

The impacts of triggered closures are difficult to predict because it is difficult to know when these triggers would be achieved. The largest potential impacts are likely to be in the Southern New England areas because there is a large amount of overlap between the Protection areas and the fishery. Under these options, it is likely that all participants would undertake additional effort to avoid river herring in general. Therefore, it is reasonable to expect that this analysis somewhat over-estimates the probability that any trigger would be reached. However, it is not clear how effective the fishery is at avoiding river herring while continuing to harvest Atlantic herring.

Overall, the negative impact of Option 3 are expected to be less than Option 1 or Option 2 because Option 3 delays additional restrictions on the fishery until a specified catch trigger is reached. Of the three sub-options under consideration for river herring catch triggers, Option 3A is likely to have the smallest negative impacts on the entire fishery because the triggers in 3A are based on the maximum estimates from the selected time frame and are likely to be reached later in the fishing year (relative to the other options), if at all (see below). Option 3B is likely to have the largest impact on the fishery in the Cape Cod and Gulf of Maine areas and the 2nd smallest impact on the participants in the Southern New England area. Option 3C is likely to have the next smallest impact on the parts of the fishery which operate in the Cape Cod and Gulf of Maine areas and the largest impact on part of the fishery which use the Southern New England areas. Summary discussion of the potential for each of these triggers to be reached is provided below. The complete analysis, including graphic results of the projections, is provided in Appendix VI, Volume II (*Detailed Analysis of Impacts of Management Measures Under Consideration to Address River Herring Bycatch*).

Reporting Option 1:

Reporting Option 1 imposes some administrative and regulatory burden on fishing vessels.

Reporting Option 2:

Reporting Option 2 also imposes some administrative and regulatory burden on fishing vessels.

Trigger Option 3A (Max):

Under Option 3A, with 100% observer coverage, the Cape Cod (CC) and Gulf of Maine (GOM) triggers are unlikely to be reached; the triggers in those regions were reached in 5% and 4% of experiments. When reached, the triggers were reached late in the fishing year. However, the triggers were reached in 46% of the experiments in the Southern New England (SNE) region. The fishery is prosecuted in the winter; therefore, the triggers are likely to be reached either in the beginning of the year or at the end of the year. Under Option 3A with 50% observer coverage, the same qualitative pattern occurs: low probability of the trigger being reached in the Cape Cod or Gulf of Maine regions and a relatively high probability in the Southern New England area.

Trigger Option 3B (Median):

Under Option 3B, with 100% observer coverage, all triggers likely to be reached. The triggers in CC, GOM, and SNE were reached in 60%, 86%, and 77% of experiments respectively. The triggers in GOM and CC are likely to be reached at various times through the fishing year. The triggers in the Southern New England region again are likely to be reached either in the beginning of the year or at the end of the year. Under Option 3B, with 50% observer coverage, the same qualitative pattern occurs. The triggers in CC, GOM, and SNE were reached in 52%, 78%, and 62% of experiments respectively.

Trigger Option 3C (Mean):

Under Option 3C, with 100% observer coverage, all triggers likely to be reached. The triggers in CC, GOM, and SNE were reached in 27%, 67%, and 93% of experiments respectively. The triggers in GOM and CC are likely to be reached at various times through the fishing year. The triggers in the Southern New England region again are likely to be reached either in the beginning of the year or at the end of the year. Under Option 3C, with 50% observer coverage, the same qualitative pattern occurs. The triggers in CC, GOM, and SNE were reached in 25%, 60%, and 80% of experiments respectively.

Option 4: Two-Phase Bycatch Avoidance Strategy (Preferred Alternative)

The two-phase bycatch avoidance approach based on SFC/SMAST/MADMF project appears promising. Herring fishery participants have commented on the learning curve associated with river herring. Until recently, river herring was simply considered another form of bait. Now, however, most of the vessel captains have learned about the necessity of avoiding a catch of river herring and have educated their crews. This collaboration with trusted institutions will allow herring fishery participants to participate in observations and facilitate monitoring/sampling that will lead to appropriate adjustments of Monitoring/Avoidance Areas and to the development of avoidance strategies. Furthermore, social science research has documented improved effectiveness of regulations developed with a participatory/collaborative approach. In addition, selection of the initial areas (the New Jersey and Rhode Island grids) for the SFC/SMAST/MADMF pilot project were chosen by consulting the Herring PDT's spatial analysis of river herring catch in the Atlantic herring fishery.

Both fixed bimonthly monitoring areas and fixed bimonthly avoidance areas could enable Atlantic herring fishery participants to avoid river herring mortality if encounters in these areas are communicated quickly and consistently. These would also demonstrate the fishery's responsiveness to concerns about river herring.

Providing the industry with an opportunity to develop a communication network and bycatch avoidance strategy could ultimately reduce costs associated with bycatch avoidance because the industry would likely prioritize cost-effectiveness when developing strategies. For this reason, and because of the positive impacts associated with industry collaboration, the negative impacts on fishery-related businesses and communities associated with river herring bycatch avoidance may be less under Option 4 than the other options under consideration. Moreover, communication networks developed for river herring avoidance might be utilized for other reasons, for example, safety-related circumstances that arise suddenly, or other fisheries or fishing-related problems. Overall, it is expected that the impact of Option 4 may be a *low negative* in comparison to Alternative 1 (no action).

6.4.6.3 Impacts of Alternative 3 (River Herring Protection) on Fishery-Related Businesses and Communities

Alternative 3 proposes to establish River Herring Protection Areas and seasonally (bimonthly) close these areas to herring fishing to some/all herring vessels. Options 1 and 2 are similar; under Option 2, the closed areas would become effective after a river herring catch trigger is reached in a particular area and may have slightly less benefit depending on when/where the trigger is reached.

The detailed analysis of the impacts of Alternative 3 provided in Appendix VI (Volume II) describes the methods used to map the directed Atlantic herring fishery in relation to the proposed River Herring Protection Areas. The potential impacts described below that affect herring fishery participants would not arise under Alternative 1 (no action alternative), but if no action is taken, any businesses that rely on the river herring, whether through a directed fishery, or indirectly as companies that rely on herring as forage, would not gain the potential benefits they anticipate with river herring protection.

Fixed bimonthly protection areas might unnecessarily constrain Atlantic herring operations, since hotspots are variable. This could lead to increased social costs triggered by economic losses. Some negative impacts could be mitigated by exempting the shrimp and large-mesh bottom trawl fisheries, but the boats most likely to benefit from these exemptions are smaller boats with Category C vessels that fish primarily inshore.

Trigger-based closed areas use a technique understood by fisheries participants. Atlantic herring participants would likely limit fishing in the protection area if feasible, but if river herring were not encountered, fishing for Atlantic herring could continue. The negative impact of this measure is that the uncertainty associated with trigger mechanisms makes planning difficult. Moreover, the complexity proposed with catch reporting to monitor a river herring trigger in addition to a haddock catch cap (Framework 46) and herring catch by management area will likely increase the reporting burden and prove to be challenging for fishery participants to provide accurate catch information in a real-time manner.

Overall, the impact of Alternative 3 in comparison to Alternative 1 (no action) is expected to be *negative*. While the impact of Alternative 2 is similar, it is of a different kind, as the impacts are related to monitoring and not closed areas.

Economic Impacts

Under this alternative, some/all vessels having a Category A, B, C, or D permit would be prohibited from fishing for, possessing, catching, transferring, or landing herring from the proposed River Herring Protection Areas on all fishing trips using small mesh. The economic impact of this alternative on fishing vessels is the change in profits of these vessels, after accounting for any behavioral changes. Under a spatial closure, the directed herring fleet may undertake different averting behavior to minimize the impact of those spatial closures. Vessels may fish in other areas, likely with lower profits. Vessels may fish in other fisheries, again, likely earning lower profits, or cease fishing operations, in which case they earn zero operating profits. The exact impacts cannot be quantified at this time. However, based on current patterns of use, the impacts are expected to be neutral for vessels that use purse seine gear. The impacts are expected to be negative for vessels that use trawl gear to harvest herring.

Maps of fishing effort in the Atlantic herring fishery are presented in Appendix VI, Volume II (*Detailed Analysis of Impacts of Management Measures Under Consideration in Amendment 5 to Address River Herring Bycatch*). The fishing time, herring catch, herring revenues, and total revenues which would occur in the River Herring Protection areas are presented below in Table 173 – Table 180. It is important to note that the revenue figures presented in Table 177 – Table 180 do not represent the economic impacts of the proposed River Herring Protection Areas. These tables should be interpreted as the effort, landings, and revenue which would be at-risk or exposed to change from the protection areas. By all four metrics, the impacts are expected to be neutral for vessels that use purse seine gear. The impacts are expected to be negative for vessels that use trawl gear to harvest herring.

There is minimal overlap between the purse seine fishery and the river herring protection areas during September-December. There is also minimal overlap between the Category D permit holders and the river herring protection areas. There is substantial overlap between the trawl fishery and the proposed river herring protection areas, particularly in January-February and November-December, with lesser overlap in other months. Over 50% of the Category A/B/C trips fished for some time within the proposed protection areas.

The effort, catch and revenue tables confirm that the River Herring Protection Areas would have minimal impact on the purse seine fleet and could have substantial impacts on the trawl fleet. In 2010, the trawl fishery spent approximately one-third of its fishing time within the proposed River Herring Protection Areas, catching one-third of the annual herring catch, 29% of its total herring revenues, and 33% of total revenues within those areas.

The impacts of the River Herring Protection Areas are likely to be largest for the trawl fishery during the winter (January-February and November-December). According to those figures, a large portion of total effort during those months occurs inside the proposed River Herring Protection Areas. Captains have built up large amounts of human capital (knowledge and experience) regarding where and how to catch fish. Closing the most productive areas to fishing will lead to higher costs (searching and steaming), lower catch-per-unit-effort, as vessels fish in unfamiliar areas and on lower densities of fish, and lower profits. For these months, captains are not likely to be familiar with alternative fishing locations. If they choose to fish for herring in alternative locations, captains will build their knowledge and experience; however, this process may take time.

This river herring protection option may have impacts on shoreside processors, bait dealers, and other consumptive users of herring. This option may reduce supply of herring, particularly in the winter months in the Southern New England areas. The substantial economic impacts noted above would carry-over to the businesses that rely on herring for their product, if supply is reduced or if the vessels limit their time at sea. Naturally, such economic impacts would also affect communities that support the herring trawl fishery.

Table 173 Fishing Time (Hours) Inside and Outside the River Herring Protection Areas

		Fishing Time		
Gear	Category	Not Protected	Protected	Grand Total
PUR		2,940	7	2,947
TR	ABC	8,029	4,077	12,105
	D	227	71	298
Grand Total		11,197	4,155	15,351

Table 174 Fishing Time (%) Inside and Outside the River Herring Protection Areas

		Fishing Time (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.3%	33.7%	100.0%
	D	76.3%	23.7%	100.0%
Grand Total		72.9%	27.1%	100.0%

Table 175 Herring Catch (lbs.) Inside and Outside the River Herring Protection Areas

		Herring Catch		
Gear	Category	Not Protected	Protected	Grand Total
PUR		18,423,800	38,741	18,462,541
TR	ABC	82,973,751	41,130,098	124,103,849
	D	112,799	36,045	148,844
Grand Total		101,510,350	41,204,884	142,715,233

Table 176 Herring Catch (%) Inside and Outside the River Herring Protection Areas

		Herring Catch (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.9%	33.1%	100.0%
	D	75.8%	24.2%	100.0%
Grand Total		71.1%	28.9%	100.0%

Table 177 Herring Revenue ($) Inside and Outside the River Herring Protection Areas

		Herring Revenue		
Gear	Category	Not Protected	Protected	Grand Total
PUR		$2,952,318	$5,760	$2,958,078
TR	ABC	$11,059,051	$4,561,645	$15,620,696
	D	$18,792	$5,645	$24,437
Grand Total		$14,030,161	$4,573,050	$18,603,211

Table 178 Herring Revenue (%) Inside and Outside the River Herring Protection Areas

		Herring Revenue (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	70.8%	29.2%	100.0%
	D	76.9%	23.1%	100.0%
Grand Total		75.4%	24.6%	100.0%

Table 179 Total Revenue ($) Inside and Outside the River Herring Protection Areas

		Total Revenue		
Gear	Category	Not Protected	Protected	Grand Total
PUR		$2,952,369	$5,760	$2,958,129
TR	ABC	$12,065,312	$6,027,755	$18,093,067
	D	$33,329	$9,683	$43,011
Grand Total		$15,051,010	$6,043,198	$21,094,208

Table 180 Total Revenue (%) Inside and Outside the River Herring Protection Areas

		Total Revenue (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.7%	33.3%	100.0%
	D	77.5%	22.5%	100.0%
Grand Total		71.4%	28.6%	100.0%

Category A/B Versus Category C and Category D Vessels

To further investigate differential impacts by herring permit category, herring catch and revenues from these vessels inside and outside the proposed protection areas are summarized by permit category in Table 181. While 22-24% of the Category D effort, catch, and revenues are derived from the monitoring areas, the magnitude of effort, catch, and revenues attributable to Category D vessels is minimal. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas. Category C vessels often participate in other fisheries and catch herring incidentally. Table 181 shows that Category C vessels derive almost 30% of their revenues from the areas proposed for closure under this alternative.

Table 181 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Protection Areas by Limited Access Herring Permit Category

Permit Cat.	No. Vessels	Inside/ Outside	Days Fished	Herring Revenues (millions dollars)	Herring Catch (millions pounds)	Total Revenue (millions dollars)
A	27	Outside	375	$11.84	83.79	$12.66
A	26	Inside	214	$6.28	55.75	$7.91
B	1	Outside	Cannot report	Cannot report	Cannot report	Cannot report
B	3	Inside	15	$0.17	1.58	$0.17
C	3	Outside	13	$0.21	0.84	$0.22
C	6	Inside	10	$0.07	0.56	$0.09
D	6	Outside	9	$0.02	0.11	$0.03
D	5	Inside	3	$0.01	0.04	$0.01

6.4.6.4 Additional Discussion of Impacts of Sub-Options for Permit Holders to Which the River Herring Measures Apply

The Council considered sub-options to apply the management measures to address river herring bycatch to either Category A/B (limited access directed fishery), Category A/B/C (all limited access vessels), or Categories A/B/C/D (all herring vessels, including open access vessels and vessels that receive new permits that may established in this amendment). Detailed information about herring vessels, by permit category, is provided in Section 5.5.1.2 of this document. Many of the potential impacts of the measures to address river herring bycatch have been discussed in the previous subsections; this section provides additional perspective on the potential impacts associated with incorporating a greater number of vessels (by permit category) into the river herring bycatch management strategy adopted in Amendment 5. The discussion in this section applies to any of the alternatives/options under consideration to address river herring bycatch.

Table 49 summarizes the number of federally permitted Atlantic herring vessels by Amendment 1 permit category and length. There were 101 vessels with limited access permits during the 2010 fishing year. The majority of participants in the directed Atlantic herring fishery are Category A and B vessels. There are 55 limited access incidental catch permit holders in the fishery, and over 2,000 open access (Category D) permit holders.

Thirty out of the 46 vessels (65%) that held a Category A or B herring permit were "active," meaning they landed herring during the 2010 fishing year. Twenty seven percent (27%) of Category C vessels (limited access incidental catch) landed herring in 2010, while only 4% of Category D permits landed herring in 2010. However, the number of D permits that landed herring increased significantly in 2010 to 94, up from 67/68 in 2009/2008 respectively.

Table 182 Number of Vessels by Atlantic Herring Permit Category, 2008-2010

Herring Permit Category		Year		
		2008	2009	2010
	A	45	45	42
	B	5	4	4
	C	58	55	55
	D	2,409	2,394	2,258

NMFS Permit databases, May 2011

In general, the more vessels to which the measures proposed to address river herring apply, the greater the impact will be, both positive and negative. Impacts of increased catch monitoring and data collection will likely be positive for river herring, Atlantic herring, other non-target species, other fisheries, and protected resources. Similarly, the costs associated with increased catch monitoring will be greater as more vessels are subject to the restrictions, so there are likely to be more negative impacts on fishing-related businesses and communities, as well as participants in other fisheries, under the sub-options that incorporate more vessels.

The tradeoffs associated with incorporating more vessels must be considered when selecting management measures to address river herring bycatch. The tradeoffs associated with incorporating more vessels must be considered when selecting management measures to address river herring bycatch. Depending on the catch monitoring program that is adopted in Amendment 5, the resources of the observer program will be stretched, perhaps leading to less coverage in other fisheries.

Additional information and analysis addressing the impacts of the measures under consideration by vessel permit category is provided in Appendix IV and VI of this document (Volume III).

6.4.6.5 Options for Shrimp/Large-Mesh Fishery Exemptions

At the September 2011 NEFMC Meeting, the Council agreed to consider exemptions to the options in River Herring Alternatives 2 and 3 that would require 100% observer coverage, Closed Area I provisions, or closed areas (Alternative 3). These exemptions are being considered for the Northern Shrimp Fishery, which operates seasonally in the inshore Gulf of Maine, and for the large mesh groundfish fishery (using mesh greater than 5.5 inches). Detailed information is included in Appendix V and VI to this document (Volume II) in order to provide perspective on river herring and other bycatch occurring in these two fisheries so that the Council can make a more informed decision when it selects the final measures for Amendment 5 and considers any exemptions.

To consider an exemption to the river herring measures proposed in Amendment 5, river herring bycatch in the small mesh Northern shrimp fishery in the Gulf of Maine was investigated. Observer data for 2005-2010 was queried from the database. Results are presented in Table 183 and Table 184 (below). The data summarized in these tables represents all observer data on trips using the Nordmore grate in the Gulf of Maine between 2005-2010, regardless of target species (a Nordmore grate is required in the Northern shrimp fishery) and regardless of whether or not the vessels possess a herring permit.

In total, from 2005-2010, 97 shrimp trips were observed, representing less than 1% of the fishery when the State-only vessels are included (Table 183). Small amounts of river herring were observed in the catch (Table 184), but the low level of observer coverage precludes expansion of the bycatch numbers to develop an estimate of bycatch across the fishery; low sampling would lead to an extremely high CV and is not appropriate in this case.

State-permitted vessels represent the majority of the fishery. These vessels do not have herring permits. In 2010, VTR records indicate that 705 trips were taken by federally permitted vessels in the shrimp fishery (Table 185), while the total number of trips including the state vessels was 1,954.

Table 183 Number of Observed Trips and Percent Coverage in the Gulf of Maine Northern Shrimp Fishery, 2005-2010

Year	No. Trips Observed	Total No. Trips	Percent Coverage
2005	17	2,261	0.75
2006	20	2,838	0.70
2007	14	1,566	0.89
2008	19	2,635	0.72
2009	12	3,510	0.34
2010	15	1,954	0.77
Total	**97**	**14,764**	

Table 184 Total Catch Observed in the Northern Shrimp Fishery (Retained and Discarded) in Pounds by Species (2005-2010)

Species	Pounds caught
HAKE, SILVER (WHITING)	7,811
HERRING, ATLANTIC	2,488
FLOUNDER, AMERICAN PLAICE	1,846
LOBSTER, AMERICAN	796
REDFISH, NK (OCEAN PERCH)	738
SCULPIN, LONGHORN	697
FLOUNDER, WINTER (BLACKBACK)	621
HAKE, WHITE	557
HERRING, NK	447
ALEWIFE	443
HAKE, RED (LING)	412
HERRING, BLUEBACK	392
FLOUNDER, WITCH (GREY SOLE)	327
POLLOCK	185
FLOUNDER, SAND DAB (WINDOWPANE)	182
DOGFISH, SPINY	123
SKATE, LITTLE	95
FLOUNDER, YELLOWTAIL	88
COD, ATLANTIC	86
MONKFISH (GOOSEFISH)	84
MACKEREL, ATLANTIC	73
BUTTERFISH	72
HAKE, RED/WHITE MIX	56
MENHADEN, ATLANTIC	50
HADDOCK	46
FLOUNDER, FOURSPOT	39
SKATE, WINTER (BIG)	38
SKATE, NK	36
STARFISH, SEASTAR,NK	33
SEAWEED, NK	30
SCALLOP, SEA	24
FISH, NK	21
WRYMOUTH	21
CUSK	20
SMELT, RAINBOW	20
RAVEN, SEA	17
ROCKLING, FOURBEARD	15
HALIBUT, GREENLAND	14
SQUID, SHORT-FIN	10
HAKE, SPOTTED	10

Table 185 shows the number of shrimp trips during 2010 that were taken by federally permitted herring vessels and other federally permitted vessels that do not possess a herring permit. Of the herring-permitted vessels, Category C vessels are most active in the northern shrimp fishery; these vessels took 495 trips in 2010. Of all 705 trips that occurred by federally permitted vessels in 2010 (601 trips by herring vessels), only seven (7) were taken when declared into the herring fishery (and therefore subject to the herring FMP requirements). It appears that the vast majority of shrimp vessels declare out of the herring fishery to avoid the additional herring requirements (pre-landing notification), as there is no allowance for herring landings in the shrimp fishery anyway.

Table 185 Number of Shrimp Trips in 2010 by Herring and Non-Herring Permit Categories

Permit Category	Trip Count
Herring A	35
Herring B	71
Herring C	495
Non-herring	104
Total	**705**

**Does not include trips taken by State-only vessels.*

Observer data suggest that large-mesh bottom trawls are catching river herring, alewife, and shad in amounts that appear to be insignificant. Table 186 summarizes observer data for 113 trips taken on 21 bottom trawl vessels with a Category A or B permit using large mesh. Table 187 summarizes observer data for 194 trips on 41 bottom trawl vessels with a Category C permit using large mesh. And Table 188 summarizes observer data for 1,832 trips on 471 bottom trawl vessels with a Category D permit using large mesh. Observed bycatch of river herring/shad appears to be slightly higher during the second half of the fishing year, but still very low. The percent coverage levels for the groups of vessels represented in these tables was not determined.

Table 186 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Large Mesh (>5.5 inch)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	158		**158**	39		**39**
FISH, NK	787		**787**	340		**340**
HERRING, ATLANTIC	284		**284**	182		**182**
HERRING, BLUEBACK	1		**1**	17		**17**
HERRING, NK	2		**2**	13		**13**
SHAD, AMERICAN	164	6	**170**	74		**74**

Table 187 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Large Mesh (>5.5)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	27		**27**	7		**7**
FISH, NK	235		**235**	46		**46**
HERRING, ATLANTIC	139	4	**143**	715	200	**915**
HERRING, BLUEBACK	6		**6**	53		**53**
HERRING, NK						
SHAD, AMERICAN	13		**13**	42		**42**

Table 188 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Large Mesh (>5.5 inch)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	698		**698**	1,272	6	**1,278**
FISH, NK	12,812	310	**13,122**	2,845	6	**2,851**
HERRING, ATLANTIC	1,188	97	**1,285**	4,983	41	**5,024**
HERRING, BLUEBACK	351	3	**354**	542	70	**612**
HERRING, NK	212		**212**	79		**79**
SHAD, AMERICAN	1,249	18	**1,267**	538	2	**540**

The proposed exemptions would have positive impacts on some fishing operations by providing opportunities to participate in other fisheries that may overlap the river herring monitoring or protection areas. If the vessels in the shrimp fishery and large mesh groundfish fishery are exempted, they may continue their fishing operations in areas that would otherwise require 100% observer coverage, increased sampling, possible closure, among other measures. Vessels in these two fisheries that also have a herring permit would be able to declare out of the herring fishery and prosecute shrimp or groundfish in the areas that those fisheries operate. This increases opportunities and may mitigate some of the negative impacts of the proposed river herring measures.

Note that the Council's ***Preferred Alternative*** to address river herring in Amendment 5 (Alternative 2, Option 4) does not include any exemptions because it relies primarily on a phased-in approach to river herring avoidance that is developed in cooperation with the industry. The measures to allocate observer coverage in Amendment 5 (Section 3.2.1), however, do not authorize waivers in areas for monitoring/avoiding river herring bycatch, so there would be no exemptions to the requirements for observer coverage in the river herring areas.

Category A vessels took 35 shrimp trips in 2010, Category B vessels took 71 shrimp trips, and Category C vessels took 495 shrimp trips in 2010 (Table 185). Category C vessels are the most dependent of the herring vessels on the shrimp fishery; these vessels are likely smaller (less than 80 feet) and hail from ME, NH, and MA. The proposed exemption for the shrimp fishery would especially benefit these vessels because of their higher level of participation in the shrimp fishery and lower level of participation in the herring fishery; some of the measures proposed in this amendment are likely to produce a significant cost on the industry, and Category C vessels land less than 3% of herring during the fishing year.

6.4.6.6 Summary of Impacts on Fishery-Related Businesses and Communities

Table 189, Table 190, and Table 191 generally summarize the impacts of the measures proposed to address river herring bycatch on fishing-related businesses and communities, including economic impacts, social impacts, and monitoring-related impacts. The tables provide a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration with respect to fishery-related businesses and communities. Relative to taking no action, Alternative 2 and Alternative 3 are likely to result in negative impacts on fishery-related businesses and communities by increasing costs to affected vessels. However, while impacts are potentially negative under both alternatives, the nature and extent of impacts of Alternative 2 rely on whether or not industry funds would be utilized to cover additional sampling/monitoring in the proposed areas. The Council's Preferred Alternative, Alternative 2 Option 4, mitigates some of these costs by phasing-in a river herring bycatch avoidance approach that is developed in cooperation with the industry. The nature and extent of impacts of Alternative 3 rely on shifts in both the distribution of herring, river herring, and fishing effort by the vessels that are affected/displaced by the proposed bimonthly closures. The tradeoffs associated with these alternatives with respect to fishery-related businesses and communities are reflected in Table 189, Table 190, and Table 191.

Table 189 Economic – Atlantic Herring Fishery Participants Focused Trade-offs of Spatial Management Approaches

	Economic- Atlantic herring fishery participants	
Possible Measure	**Positive Impacts**	**Negative Impacts**
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	There are no economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	The SBRM-prioritized monitoring of fishing fleets can be considered the optimal pattern of observer coverage. To the extent that Fixed Bimonthly Monitoring Areas results in diversion of scarce observer days away from this optimal pattern of observer coverage, there is an economic loss. This is a loss of information which will result in less data available about bycatch in other fisheries and, presumably, stock assessments with larger errors. If the Fixed Bimonthly Monitoring Areas do not shift observer days away from the optimal pattern, then there is no information loss. If additional observer coverage is paid for by industry, this represents a negative economic impact. This can be calculated by estimating the additional observer coverage days and multiplying by the cost of an observer day. The Closed Area I Sampling Provisions would entail slightly higher regulatory and compliance costs than the other options being considered.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)		
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	There are no direct economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	Decreases in revenue in the directed Atlantic Herring Fishery and/or increases in costs of fishing for participants in the directed Atlantic Herring Fishery. The largest impacts are likely to be felt by trawl fishery participants during the winter season due to the high overlap between the Protection Areas and the current spatio-temporal distribution of fishing effort.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	There are no direct economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	Decreases in revenue in the directed Atlantic Herring Fishery and/or increases in costs of fishing for participants in the directed Atlantic Herring Fishery. The largest impacts are likely to be felt by trawl fishery participants during the winter season due to the high overlap between the Protection Areas and the current spatio-temporal distribution of fishing effort. These costs are likely to be lower than Alt 3, Opt 1; however, there is substantial uncertainty associated with projecting when the Triggers might be reached.

**This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The **Preferred Alternative** in Amendment 5 is represented by the shaded row above.*

Table 190 Social – Focused Trade-offs of Spatial Management Approaches

	Social/Other- management, directed-river herring fishery, etc.	
Possible Measure	**Positive Impacts**	**Negative Impacts**
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Participants in the directed river herring fishery should see increased availability of river herring catch, if the fixed monitoring areas results in higher stock levels of river herring. Indirect users of the river herring resource, including consumers that use species that prey on river herring, will benefit if the monitoring areas result in higher stock levels of river herring. Would enable Atlantic herring fishery participants to avoid river herring mortality if encounters are communicated quickly and consistently.	Increased economic costs associated with industry payment for observers could trigger additional losses of vessels and processing plants, thereby also affecting bait supplies for other fisheries.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Would enable Atlantic herring fishery participants to avoid river herring mortality if encounters are communicated quickly and consistently. This would also demonstrate the fishery's responsiveness to concerns about river herring.	Increased economic costs with industry payment for observers could trigger additional losses of vessels and processing plants, thereby also affecting bait supplies for other fisheries. Keeping the threshold values meaningful could be problematic as the size of the river herring stock changes.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	Most straight-forward option to enforce	Since the hotspots are variable, this might unnecessarily constrain Atlantic herring operations, leading to increased social costs triggered by economic losses.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Triggers are understood so Atlantic herring fishery participants would be likely to limit fishing in the protection area if feasible, but if river herring is not encountered, fishing could continue if the Atlantic herring are present.	Uncertainty associated with trigger mechanisms makes planning more difficult. Keeping the trigger values meaningful could be problematic as the size of the river herring stock changes.

**This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The **Preferred Alternative** in Amendment 5 is represented by the shaded row above.*

Table 191 Monitoring – Focused Trade-offs of Spatial Management Approaches

	Monitoring- NEFOP	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	Benefits associated under the no action alternative possible if catch monitoring provisions that would apply across the fishery, (i.e. the 100% observer coverage option) which would allow for observers to document interactions with river herring across the fleet, at different times and in different areas that perhaps have not been sampled before. More coverage allows for more biological sampling, more scale sampling and length frequency collection which will aid in the stock assessment process and will add to further understanding of the species and stock. Catch Monitoring Alternatives 3 and 4 would also increase coverage rates, if selected, and therefore provide the same type of biological benefits associated with increased sampling, and generally increasing the possibility of encountering the species. Increased monitoring will lead to greater understanding of interactions with river herring and the overall fleet during peak fishing times and off peak fishing times of the year.	Increased monitoring beyond federal funds would cost the industry and would have a negative impact with the potential for backlash to observers if/when industry has to pay for them. Or it could be the opposite – perhaps industry will buy into the increase in scientific information to improve stock assessments for the future of their fishery, and therefore work more closely with observers. Cost could be different if an industry funded at-sea monitoring program were developed vs. a full observer program currently in place.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Increased sampling would be achieved, therefore further quantifying the catch composition. Biological sampling would be increased, potentially if increased interactions occur. Further understanding of the interactions and where and when they take place. Ground-truthing the monitoring areas if catches show river herring composition. May in fact avoid fishing in areas with the coverage requirements, if they are paying for the coverage, which would decrease potential negative impacts on the species.	Possibly difficult determining ahead of time what areas the fleet will fish in, and therefore how they will notify for an area. Are they allowed to fish in multiple monitoring areas on a single trip, if not it would impact their flexibility and therefore possible catch, if there are low catch rates in an area. Can they fish inside and outside of a monitoring area, and if so do they need to have the coverage for that particular situation? How to enforce the notifications (i.e. what if they notify for one area and fish in another?) This could affect the coverage rates if coverage is less than 100%. Increased monitoring beyond federal funds would cost the industry and would have a negative impact. Again, an ASM program may be a cost-effective option. Monitoring areas are set in place until a framework action is taken, which could take some time, if river herring are not present in the areas, as would be documented by the observer data, and the industry is paying for it likely they will want to update the area determination quickly.

Table 191 Continued.

	Monitoring- NEFOP	
Possible Measure	**Positive Impacts**	**Negative Impacts**
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Same as above	Same as above
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)		
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Similar to Monitoring/Avoidance	Similar to Monitoring/Avoidance Except similar to the haddock cap, if the industry is paying attention to the trigger number, and they are close to hitting the trigger, which could prove difficult for observers. Pressure is higher on such trips. Potential of releasing catch (slippage) may be higher. Or if the industry knows if they hit the trigger then they have to pay for 100% coverage to fish in an area, again may lead to potential slippage events.

**This table provides a qualitative comparison of the positive and negative impacts that may result from the alternatives under consideration. The impacts of the no action alternative are discussed in detail in the previous subsections.*

*The **Preferred Alternative** in Amendment 5 is represented by the shaded row above.*

6.4.7 Impacts of Option to Establish River Herring Catch Caps (***Preferred Alternative***)

Currently, this amendment proposes to add river herring catch caps as one measure that could be implemented in the future through a framework adjustment to the Herring FMP (Section 3.3.5). The proposed mechanism would allow for a river herring catch cap to be established through either a framework adjustment or the herring fishery specifications process, once ASMFC completes a stock assessment for the river herring resource. Since there is no specific catch cap proposed in the amendment, there are no ***direct*** impacts on any of the Amendment 5 VECs expected from the option under consideration. The impacts of any caps established in the future will be evaluated through the action that establishes them (framework adjustment, or through the herring specifications process, as indicated in Section 3.3.5). During its November 2012 meeting, the Council identified a framework adjustment to establish river herring catch caps as one of its management priorities for 2013, so it is expected that work on this framework adjustment will begin during the review/implementation of Amendment 5.

During the Councils deliberations on the Amendment 5 alternatives, the Herring PDT provided a detailed discussion paper addressing the development of river herring catch caps, including a discussion of the potential challenges associated with implementing and monitoring, as well as the potential impacts of catch caps. The Herring PDT's discussion paper can be found in Volume II of this amendment (Appendix VII, Discussion Paper: *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery* (December 2010)) and forms the technical/analytical basis for future development of river herring catch caps through a framework or specifications process. Some of the relevant analysis is summarized below, but Appendix VII should be referenced for more detailed technical information.

In the fall of 2010, the Herring PDT was tasked by the Council with developing river herring catch cap options for consideration in Amendment 5. The initial task was summarize and review past studies on river herring removals at sea. Then, the PDT agreed to calculate the best possible estimate of river herring removals by the Atlantic herring fishery. The analysis included selecting 2005- 2009 observer and VTR data from those trips landing greater than 2,000 lbs of Atlantic herring. Data was pooled across gear types. Two methods were used to examine and estimate river herring removals from the directed Atlantic herring fishery. Both methods are based on the Standard Bycatch Reporting Methodology (SBRM) amendment (2007). In general, Method 1 uses the ratio of river herring to Atlantic herring for the expansion, while Method 2 extrapolates to the trip level by using the mean discard level per trip. Calculation for river herring removals by the fishery were made for three sub-areas: Cape Cod (CC), Gulf of Maine (GOM), and Southern New England (SNE). As can be seen by the tables and figures provided in the detailed analysis (Appendix VII, Volume II0, in general the CC area and the GOM area had lower removals of river herring when compared to SNE area. Also both CC and GOM had similar removal levels of river herring by the directed herring fleet.

The Herring PDT recognized that their estimates of river herring removals have high uncertainty. Sampling by year, gear and area is not complete and missing strata exist in the dataset across years. The distribution of river herring catch has high variability and strata sample sizes are generally low. Finally, their estimates of uncertainty are likely to be underestimated because within trip variation of river herring catch is not propagated into the variation of the total catch estimate. Separating the strata into seasonal-area groups exacerbates the missing strata problems.

The non-sampling component of inter-annual variation for river herring catch can also include population dynamics such as year-class strength and population size, oceanographic conditions, and distribution of Atlantic herring fishing effort. The time series is currently too short to investigate whether these factors impact river herring catch in the Atlantic herring fishery. River herring do not currently have a stock assessment, thus the removal cap cannot be related to the river herring population. The cap only functions to prevent future river herring catch from exceeding recent catches. If river herring populations decline, then the cap may be too high for the river herring population. If a strong year-class is produced, then the cap may be set too low relative to the river herring population size, prematurely closing the Atlantic herring fishery.

The Herring PDT did not agree on an approach to setting a catch cap in Amendment 5, but did discuss possible alternatives. Some of the options rely on the use of the catch history estimates described above, while others do not. The options include using the historical catch history (ceiling, percentage), waiting for a stock assessment (reference points), and liming fishing activity (limit hauls/sets or trips based on a threshold level of river herring removals).

The example catch caps analyzed by the Herring PDT in Appendix VII are proposed in this amendment as catch triggers under Alternatives 2 and 3 to address river herring bycatch (Section 3.3.2.2.3 and 3.3.3.2.2). A range of options for catch triggers, based on the PDT's work, is being considered along with two reporting options to monitor the triggers. These trigger options provide the opportunity to assess the potential impacts of catch caps on the VECs in Amendment 5, so much of the technical work and analysis is provided up-front in this EIS, thereby allowing the Council to use the framework adjustment process in the future to implement river herring catch caps. The analysis of the river herring catch triggers is discussed in Sections 6.4 of this document. The analysis presented in Appendix VI (*Detailed Analysis of Impacts of Management Measures Under Consideration in Amendment 5 to Address River Herring Bycatch*) includes the technical information and methodologies utilized to develop the trigger options, as well as a thorough analysis of fishery data to project when the triggers may be reached during the fishing year in each of the trigger areas. This analysis lays the groundwork for implementing catch caps through a framework adjustment in the future. Additional analyses will be provided as the details of the framework adjustment are developed.

6.5 IMPACTS OF MANAGEMENT MEASURES TO ADDRESS MIDWATERAWL ACCESS TO GROUNDFISH CLOSED AREAS

6.5.1 Background Information

The Council considered several alternatives in Amendment 5 to establish criteria for midwater trawl vessels to access the year-round groundfish closed areas:

Alternatives 1 and 2: Alternative 1 represents the current "status quo," and Alternative 2 eliminates the Closed Area I sampling provisions (unrestricted access to closed areas); the Framework 46 provisions and haddock catch cap would continue to apply under both alternatives

Alternative 3: 100% observer coverage on midwater trawl vessels in the groundfish year-round closed areas (in addition to Closed Area I sampling provisions and haddock catch cap/Framework 46 provisions)

Alternative 4 (*Preferred Alternative)*: Closed Area I sampling provisions apply in all groundfish year-round closed areas (sub-options 4A *Preferred* to require 100% observer coverage and 4B for less than 100% observer coverage)

Alternative 5: Closed Areas (no midwater trawl fishing allowed in the year-round groundfish closed areas)

The Council proposes to apply the Closed Area I sampling provisions with 100% observer coverage to all midwater trawl vessels fishing in the year-round closed areas. If the groundfish year-round closed areas are modified and/or eliminated in the future, access by midwater trawl vessels will be considered accordingly in the related groundfish action. This amendment also proposes 100% observer coverage for Category A and B herring vessels (Catch Monitoring At-Sea, Section 3.2.1.2), with full sampling provisions and trip termination measures in all areas of the fishery for all limited access herring vessels (Measures to Address Net Slippage, Section 3.2.3.4). The measures proposed to apply in the year-round groundfish closed areas would include slightly different sampling provisions (more closely mirroring Closed Area I) in these areas and would extend the observer coverage requirements to Category C herring vessels fishing with midwater trawl gear.

Establishing criteria and provisions for midwater trawl access to groundfish year-round closed areas is largely a policy decision to be made by the Council. Analysis of data collected by the NEFOP does not indicate that groundfish bycatch by midwater trawl vessels has a significant effect on fishing mortality/rebuilding for groundfish stocks (see following information/analysis). Haddock comprises the largest component of groundfish bycatch by midwater trawl vessels, and the catch of haddock by these vessels is managed by the Council through a catch cap (Framework 46) and increased sampling (Closed Area I provisions). The alternatives that propose to establish criteria for midwater trawl vessel access to the year-round groundfish year-round closed areas include many of the measures under consideration in Amendment 5 to improve at-sea sampling and address river herring bycatch (see Sections 3.2.2 and 3.3 of this document). Depending on what management measures are ultimately selected by the Council for implementation in Amendment 5, some of the alternatives to establish criteria for groundfish closed area access may be redundant and moot. In addition, there has been considerable discussion by the Council of considering an action to eliminate the year-round groundfish closed areas; no action is currently under development, and the timing for considering this action is not clear, but the Council may address this issue in the upcoming year.

The impacts of these alternatives relative to the VECs identified in this amendment are discussed below. Some of the criteria under consideration include increased monitoring and sampling. Depending on which alternative is ultimately adopted, the measures to establish criteria for midwater trawl vessel access to groundfish closed areas may support the overall goal of Amendment 5 to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

6.5.2 Impacts on Atlantic Herring

The Atlantic herring fishery is administered in accordance with the Atlantic Herring FMP. The Herring FMP was developed by the Council and implemented by NMFS, in 2000. The specification-setting process is the primary management tool to administer the herring fishery and was modified in 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 provision that any overages would be deducted from future harvest levels (Accountability Measures).

In general, the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The measures proposed to address midwater trawl access to the year-round groundfish closed areas are not likely to affect removals of herring from the fishery. All of the alternatives considered in this section are unlikely to affect the amount of herring available for harvest or total removals from the fishery. Therefore, there would likely be no direct impacts to the Atlantic herring resource associated with implementing any of the alternatives to establish criteria for midwater trawl vessel access to the groundfish closed areas.

The alternatives that propose to establish criteria for midwater trawl vessel access to the year-round groundfish year-round closed areas include many of the measures under consideration in Amendment 5 to improve at-sea sampling and address river herring bycatch; consequently, the expected impacts on the Atlantic herring resource are similar. More specifically, the groundfish closed area alternatives, which consider high observer coverage rates, Closed Area I sampling provisions, and closed areas, will likely have little direct impact on the Atlantic herring resource but may increase sampling and improve catch statistics; therefore, there may be long-term positive impacts associated with these measures. The specific benefits to the herring resource that may result are difficult to quantify with respect to each of the individual alternatives under consideration.

As catch information improves, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The quantification of previously unaccounted mortality could improve the data used in assessments, thereby decreasing scientific uncertainty, albeit to an unknown degree. In addition, reducing the likelihood for errors in the calculation of catch statistics through increased sampling could reduce management uncertainty (uncertainty about catch estimates is a component of management uncertainty) and long-term management of the herring fishery may improve.

Alternative 1 represents the "status quo" alternative; **Alternative 2** is less restrictive than the status quo because it eliminates the Closed Area I sampling provisions. The impacts with respect to the herring resource are expected to be neutral under Alternative 1 because status quo conditions would be maintained. While some of the low positive impacts expected under the options considered (below) would not be experienced under Alternative 1, the impacts difficult to quantify with respect to the individual alternatives but are not likely to be significant. The overall impact of taking no action, therefore, is *neutral*. Under Alternative 2, the additional sampling requirements in Closed Area I would be eliminated, so any positive impact, however small, that may be resulting from increased sampling in Closed Area I would be eliminated. Alternative 2 may therefore have a slightly *low negative* impact on the herring resource when compared to the no action alternative.

Alternative 3 would require 100% observer coverage on midwater trawl vessels fishing in the year-round groundfish closed areas. While there is not likely to be any direct impact on the herring resource from increasing observer coverage on midwater trawl vessels in the groundfish closed areas, the indirect benefits to the resource of increased monitoring/sampling have been addressed several times in this document and apply to this alternative in the groundfish closed areas. As catch information in the fishery continues to improve, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The benefits to the herring resource are difficult to quantify with respect to the individual alternatives under consideration but are expected to be *low positive* under Alternative 3 in comparison to the no action alternative.

Alternative 4 (*Preferred Alternative*) would implement the Closed Area I sampling provisions on midwater trawl vessels fishing in all of the year-round groundfish closed areas. While there is not likely to be any direct impact on the herring resource from increasing observer coverage on midwater trawl vessels in the groundfish closed areas, the indirect benefits to the resource of increased monitoring/sampling have been addressed several times in this document and apply to this alternative in the groundfish closed areas. As catch information in the fishery continues to improve, discard estimates can be incorporated into future stock assessments for Atlantic herring, thereby potentially reducing some uncertainties associated with the assessment data/models, improving biomass and fishing mortality estimates, and enhancing the Council's ability to successfully manage the herring resource at long-term sustainable levels. The benefits to the herring resource are difficult to quantify with respect to the individual alternatives under consideration but are expected to be *low positive* under Alternative 4 in comparison to the no action alternative.

Alternative 5 would close all of the year-round groundfish closed areas to midwater trawl fishing. The Atlantic herring resource is not overfished and overfishing is not occurring. The herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The selection of Alternative 5 in this case is not likely to affect total removals of herring from the fishery; it is unclear how closing these areas may affect herring fishing and/or shift effort in the open areas, but it is assumed that the sub-ACLs would continue to be utilized in a manner similar to recent fishing history. Therefore, the overall impact on the Atlantic herring resource is likely to be *neutral*. However, because the groundfish year-round closed areas are rather large and would be closed to all midwater trawl fishing, there may be some localized benefits to the herring resource in those areas as concentrations of fishing effort are reduced/eliminated. It is possible that some additional protection would be afforded to biodiversity in the closed areas, but the extent to which this may occur cannot be predicted.

6.5.3 Impacts on Non-Target Species and Other Fisheries

Midwater Trawl Vessel Catch in Groundfish Closed Areas

On November 3, 2009, NMFS announced new regulations for any vessel issued a Category A or B herring permit fishing in Northeast Multispecies Closed Area I (CAI). These requirements included 100 percent observer coverage on trips in the closed areas and a prohibition on releasing catch before it is sampled by an observer, except in certain circumstances. The results of this coverage offer a unique look into the overlap between the herring fishery and the northeast multispecies.

As a result of the requirement, there was a high percentage of observer coverage on midwater trawl trips to Herring Management Area 3 in 2010. There were 114 observed trips on GB in CY 2010; 105 in FY 2010. Through March, 2011, during FY 2010 there were 135 MWT trips on GB according to VTR records. As a result, about 84 percent of reported VTR trips carried an observer during the fishing year. Total herring landings from GB in CY 2010 were about 15,430 mt according to IVRs. Estimated landings on observed trips were about 14,700 mt, so about 95 percent of the landed herring came from observed trips. This provides a near census of midwater trawl (MWT) fishing activity on GB in CY and/or FY 2010. The analyses were performed when data were available through October 2010, so these data reflect an additional two months of data that were not used in the previous sections.

The following information is based on the ending tow locations to be consistent with how NMFS determines catch areas, and the data below are reported for all tows on trips with an observer unless otherwise specified, and not just those tows that are flagged as observed (which means discards were estimated). While this gives a higher count of tows and accounts for more MWT catch, it could be argued that by including tows where discards may not have been estimated it makes discards appear lower than actually occurred. Observer practices for pair trawl trips differ slightly from those used with other gear. A tow is only coded as observed if all the catch is observed and discards are estimated. In pair trawl operations, if the catch is split between the two vessels, the tow is coded as not observed because the observer does not see the catch that is take onto the other vessel. As shown in the table below, differences between the two approaches are minor. These analyses consider not just haddock, but all groundfish to reflect that there are regulatory requirements that set a standard for the amount of groundfish caught in closed areas as a proportion of the amount of herring and mackerel kept (50 CFR 648.81(a)(2)(iii)). Almost all the groundfish catch is haddock, and almost all the kept catch is Atlantic herring.

In 2010, NMFS observer coverage on herring vessels in Area 3 (Georges Bank) was about 85%. Table 192 shows that the observed ratio of groundfish to kept species (almost all of which is Atlantic herring) in 2010 was higher in the closed areas than in the open areas of Georges Bank. The difference between CAI and open areas was relatively small, but the ratio for CAII was noticeably higher, although the number of observed tows in CAII was small.

Table 192 – Summary of Catch (Pounds) on Observed MWT Trips to GB in CY 2010

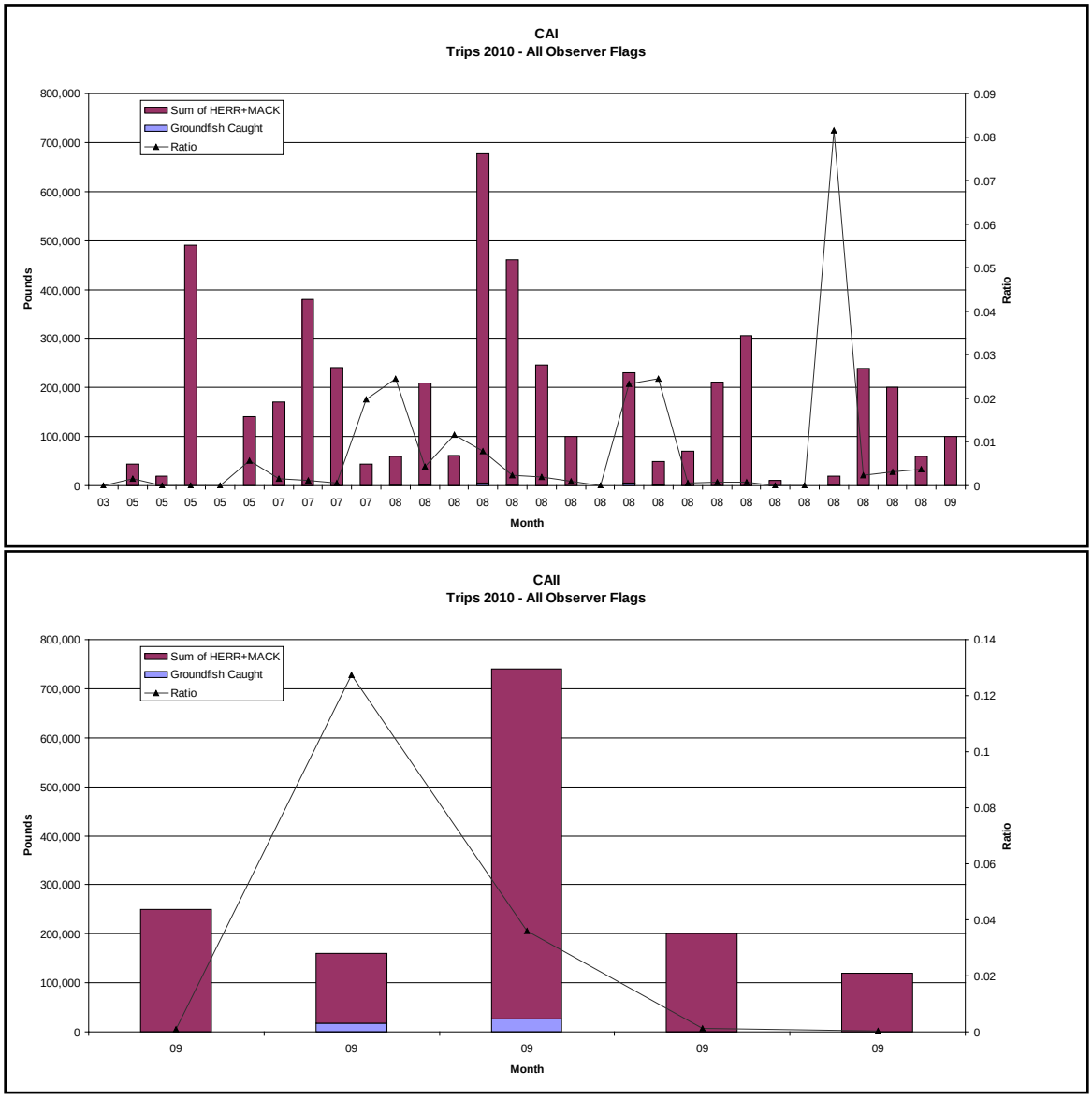
	Groundfish Caught	Alt Herring Kept	Mackerel Kept	Herring NK Kept	Ratio Groundfish/ (Herring + Mackerel)
	All tows on trips with an observer				
CAI	22,525	4,790,088	27,810	0	0.0047
CAII	44,248	1,423,605	0	0	0.0311
Open	87,623	26,165,111	121,174	4	0.0033
Total	154,396	32,378,804	148,984	4	0.0047
Combined CAs	66,773	6,213,693	27,810	0	0.0107
	Tows coded as observed only				
CAI	21,828	4,245,530	2,370	0	0.0051
CAII	43,772	1,254,462	0	0	0.0349
Open	86,603	24,201,905	121,169	4	0.0036
Total	152,203	29,701,897	123,539	4	0.0051
Combined CAs	65,600	5,499,992	2,370	0	0.0119

Source: Groundfish Amendment
For this analysis GB defined as SAs 521/522/525/525/561/562 only

The ratio of haddock (as opposed to all groundfish) to herring was examined in CAI and CAII in two ways. Individual tows were plotted and assigned to the closed area based on where the haul ended. The tows were first summarized by trip and then individual tows were examined. In CAI the ratio of groundfish caught to herring and mackerel kept varied. Generally the ratio is highest on those trips with the smallest kept catches. The same relationship is not as evident for the trips in CAII, but with only five trips it is difficult to draw conclusions.

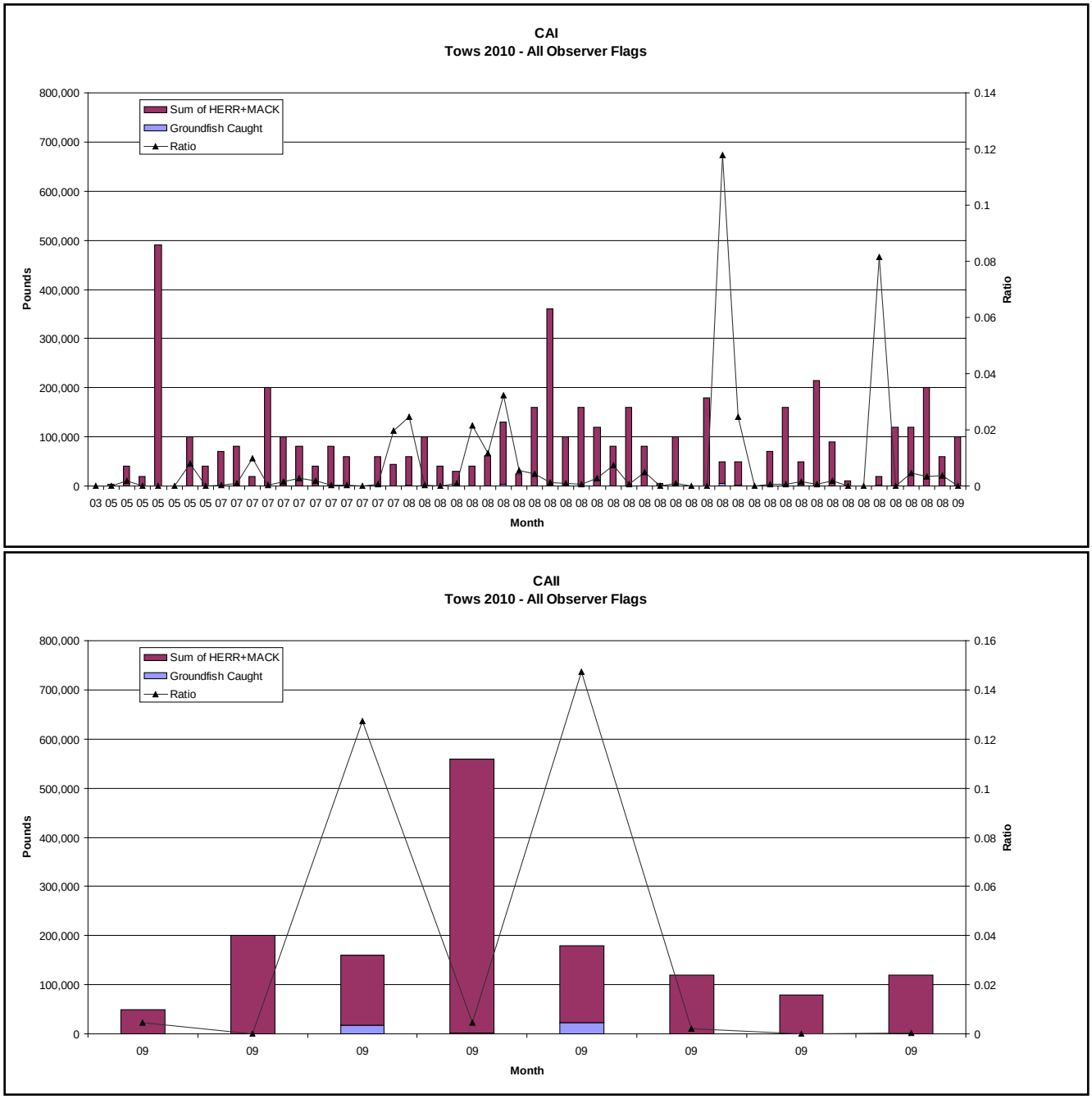
With respect to individual tows (Figure 94), again in CAI it appears that generally the higher ratios of groundfish to kept herring and mackerel occur with small kept catches, though this is not always the case. There are a limited number of tows in CAII that preclude drawing firm conclusions but it does appear that even on an individual tow basis more groundfish is caught in CAII.

Figure 93 2010 Midwater Trawl Trips in CAI and CAII



Source: NEFOP

Figure 94 2010 Midwater Trawl Trips in CAI and CAII



Source: NEFOP

The Herring PDT's analysis of Alternative 4 to allocate observer coverage on limited access herring vessels indicates that removals of haddock by Category A/B/C vessels were approximately 222,524 pounds (about 101 mt) during 2010, with a CV of 28% (See technical analysis presented in Appendix III, Volume II: *Detailed Analysis of Impacts of Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*). Table 193 provides NMFS' estimates of commercial removals (landings and discards) of haddock for the 2010 fishing year. Removals from other sources (state waters, recreational fisheries) are not included in the table but are not significant (with the exception of recreational removals of Gulf of Maine haddock). These numbers provide some context to evaluate the potential impact of haddock removals by herring midwater trawl vessels. The commercial haddock fishery remains under-utilized, and removals by herring midwater trawl vessels are relatively small given the available yield.

Table 193 FY 2010 (May 1 – April 30) Commercial Haddock Catch (mt)

Stock	Sub-ACL (mt)	Cumulative Catch (mt)	Percent Caught
GB Haddock	40,440	8,340.2	20.6
GOM Haddock	825	377.7	45.8

Alternative 1 (No Action/Status Quo)

This alternative would continue to allow midwater trawl fishing in the year-round groundfish closed areas, and would maintain the enhanced monitoring requirements when fishing in CAI. The haddock catch cap and 100-lb multispecies possession limit would continue to apply, and there would still be prohibitions against discarding haddock at sea. The impacts with respect to non-target species and other fisheries are expected to be neutral under Alternative 1 because status quo conditions would be maintained. While some of the low positive impacts expected under the options considered (below) would not be experienced under Alternative 1, the impacts difficult to quantify with respect to the individual alternatives but are not likely to be significant. The overall impact of taking no action, therefore, is *neutral*.

Alternative 2 (Pre-Closed Area I Provisions)

This alternative would also continue to allow midwater trawl fishing in the groundfish closed areas, but would eliminate the additional monitoring/sampling provisions in CAI. It is therefore less restrictive than the no action alternative. However, as discussed throughout this document, providing data about previously unrecorded bycatch of non-target species may improve catch statistics and subsequent assessment and management of those species over the long-term. Therefore, while eliminating the CAI provisions are not likely to have a direct impact on non-target species and other fisheries, there may be an *indirect low negative* impact resulting from the reduction in catch sampling on midwater trawl vessels in CAI relative to the no action alternative.

Alternative 3 (100% Observer Coverage)

This alternative would require 100% observer coverage on midwater trawl trips occurring in all the year-round groundfish closed areas. This alternative could lead to a decrease in midwater trawl trips in the groundfish closed areas if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues. It is expected that this fishing effort would be redistributed to other herring fishing grounds outside the groundfish closed areas. The impacts on non-target species and other fisheries, therefore, are difficult to predict. However, requiring 100% observer coverage on the midwater trawl trips in the groundfish closed areas would result in increased sampling of the trips these vessels take in the closed areas and could lead to the collection of additional information about catch and bycatch in the herring fishery. As a result, this alternative could have *low positive* impacts on non-target

species and other fisheries to the extent that the additional observer coverage enhances catch information and improves the counting and/or precision of bycatch estimates. The potential for positive impacts is greatest for the groundfish species, as these areas were selected by the Council to reduce groundfish mortality and rebuild groundfish stocks. Catch information presented in this section indicates that the majority of groundfish bycatch by midwater trawl vessels is haddock, the catch of which on midwater trawl vessels is already managed through a catch cap.

Alternative 4 (Preferred Alternative – Apply Closed Area I Provisions)

This alternative would apply the current CAI provisions to all trips in all groundfish closed areas. These provisions relate to pumping all fish, the ability to make test tows, not pumping/authorized release of the net due to safety or other specified concerns, slipped catch affidavit requirement, and requirement to leave the closed area if the net is released for exempted reasons. Alternative 4A (***Preferred Alternative***) would apply these requirements and also require 100% observer coverage, whereas alternative 4B would only apply the listed provisions. The impacts of this alternative on non-target species and other fisheries is expected to be *low positive*, resulting from enhanced sampling and the potential documentation of previously unrecorded catch. Providing documentation of previously unrecorded bycatch of non-target species may improve catch statistics and subsequent assessment and management of those species over the long-term.

Alternative 5 (Closed Areas)

This alternative would close all of the groundfish closed areas to midwater trawl vessels, but would endorse experimental fisheries. If this alternative is selected, the fishing effort that currently occurs in the groundfish closed areas (representing 12% of revenues in 2010) would likely be redistributed to other herring fishing grounds. The impacts of this alternative on non-target species and other fisheries are therefore difficult to predict. Relative to the no action alternative, however, the impacts of this alternative on non-target species and other fisheries is likely to be *positive* for the reasons addressed in other sections of this document and summarized below.

However, the groundfish year-round closed areas were selected and closed to groundfish fishing to reduce fishing mortality and offer protection to groundfish stocks and spawning grounds. Eliminating midwater trawl fishing from these areas would provide a positive impact in that it would further reduce fishing activity in the areas and help to ensure that catch of non-target species and other fisheries in the area is minimized. The closed areas may provide mortality reductions for some non-target species, especially groundfish. This benefit, however, is dependent on individual species life history and migratory patterns along with their susceptibility to fishing gears at different life stages. It is important to note that catch information presented in this section indicates that midwater trawl vessels are not catching significant amounts of groundfish either inside or outside the closed areas; the majority of groundfish bycatch by midwater trawl vessels is haddock, the catch of which on midwater trawl vessels is already managed through a catch cap.

6.5.4 Impacts on Physical Environment and EFH

Alternative 1 (No Action/Status Quo)

This alternative would continue to allow fishing in the groundfish closed areas, and would maintain the enhanced monitoring requirements when fishing in CAI. The haddock catch cap and 100-lb multispecies possession limit would continue to apply, and there would still be prohibitions against discarding haddock at sea. Alternative 1 would maintain current measures to protect EFH and therefore no adverse effects on EFH are expected.

Alternative 2 (Pre-Closed Area I Provisions)

This alternative would also continue to allow fishing in the groundfish closed areas, but would revert to previously implemented monitoring provisions in CAI. The haddock catch cap and 100-lb multispecies possession limit would continue to apply, and there would still be prohibitions against discarding haddock at sea. Alternative 2 is not expected to produce any adverse effects to EFH as bottom contact by MWT is occasional and the impacts are minimal and/or temporary, compared to Alternative 1.

Alternative 3 (100% Observer Coverage)

This alternative would require 100% observer coverage on trips occurring in all the groundfish closed areas (100% observer coverage is currently mandatory for permit category A and B trips into CAI). This alternative could lead to a decrease in herring trips in the groundfish closed areas if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues. It is expected that this fishing effort would be redistributed to other herring fishing grounds outside the groundfish closed areas. However, since midwater trawl gear has been determined to only occasionally contact the bottom and its impact on benthic habitats has been determined to be minimal and temporary, this alternative would not cause any additional impacts to EFH.

Alternative 4 (Preferred Alternative – Apply Closed Area I Provisions)

The ***Preferred Alternative*** in Amendment 5 would apply the current CAI provisions to all trips in all groundfish closed areas. These provisions relate to pumping all fish, the ability to make test tows, not pumping/authorized release of the net due to safety or other specified concerns, slipped catch affidavit requirement, and requirement to leave the closed area if the net is released for exempted reasons. Alternative 4A would apply these requirements and also require 100% observer coverage, whereas alternative 4B would only apply the listed provisions.

Alternatives 4A and 4B could lead to a decrease in herring trips in the groundfish closed areas if industry funding is required and vessel owners are unwilling to absorb the cost of observer coverage given expected revenues, or if vessel operators elect not to comply with the listed provisions . As above, it is expected that this fishing effort would be redistributed to other herring fishing grounds outside the groundfish closed areas. However, since midwater trawl gear has been determined to only occasionally contact the bottom and its impact on benthic habitats has been determined to be minimal and temporary, this alternative would not cause any additional EFH impacts.

Alternative 5 (Closed Areas)

This alternative would close all of the groundfish closed areas to midwater trawl vessels, but would endorse experimental fisheries. If this alternative is selected, the fishing effort that currently occurs in the groundfish closed areas (representing 12% of revenues in 2010) would be redistributed to other herring fishing grounds. Catching the herring sub-ACLs outside the closed areas would probably result in some additional amount of fishing effort because both catch and revenue per hour are higher when fishing in the closed areas. This could result in increased bottom contact, especially if there is increased midwater

trawling in the open areas on Georges Bank during the spawning season (September-November) when pre-spawning adult herring aggregate near the bottom and the gear is more likely to contact the bottom. Potential changes in the magnitude and location of fishing effort, and thus potential changes in seabed contact rates, are difficult to predict. Any additional disturbance of benthic habitats on the spawning grounds would in all likelihood be minimal and temporary since the bank is predominantly sandy and exposed to strong bottom currents. EFH for herring eggs in particular consists of relatively shallow water with gravels and strong currents, and this type of habitat is only minimally affected by seabed gear contact.

6.5.5 Impacts on Protected Resources

Alternative 1 (No Action/Status Quo)

This alternative would continue to allow midwater trawl fishing in the year-round groundfish closed areas, and would maintain the enhanced monitoring requirements when fishing in CAI. The haddock catch cap and 100-lb multispecies possession limit would continue to apply, and there would still be prohibitions against discarding haddock at sea. The impacts with respect to protected resources are expected to be neutral under Alternative 1 because status quo conditions would be maintained. While some of the low positive impacts expected under the options considered (below) would not be experienced under Alternative 1, the impacts difficult to quantify with respect to the individual alternatives but are not likely to be significant. The overall impact of taking no action, therefore, is *neutral*.

Alternative 2 (Pre-Closed Area I Provisions)

This alternative would also continue to allow midwater trawl fishing in the groundfish closed areas, but would eliminate the additional monitoring/sampling provisions in CAI. It is therefore less restrictive than the no action alternative. As discussed throughout this document, providing data about previously unrecorded bycatch of non-target species may improve catch statistics and subsequent assessment and management of those species over the long-term. Therefore, while eliminating the CAI provisions are not likely to have a direct impact on non-target species and other fisheries, there may be an impact resulting from the reduction in catch sampling on midwater trawl vessels in CAI relative to the no action alternative. However, because CAI represents a small component of the overall fishery, the impacts of eliminating the sampling provisions in this area on protected resources is likely to be neutral.

Alternative 3 (100% Observer Coverage)

This option has the potential to have a low positive impact on protected resources. One hundred percent observer coverage would represent a census of midwater trawl boats in the Atlantic herring fishery in the groundfish year round closed areas, and therefore could provide as much information as possible on any and all protected resources that were encountered by the fishery in those areas that may be encountered by midwater trawl vessels, to the extent that an observer or service provider could possibly sample. More observer coverage will also capture some of the rarer encounters of protected species with the herring fisheries. In comparison to the No Action Alternative, Alternative 3 has the potential to have a *low positive* impact on protected species by increasing the amount of information that is gathered, and therefore increasing the amount of knowledge with respect to those species.

Alternative 4 (Preferred Alternative – Apply Closed Area I Provisions)

The impacts of the Council's ***Preferred Alternative*** are expected to be very similar to Alternative 3 (low positive), however the benefit would be wider spread as more information could be gathered as the observer coverage would greater and the information gathered would be a larger body to draw from and benefit protected resources.

Alternative 5 (Closed Areas)

This action could provide a *potentially low positive* impact for protected resources by reducing the chance of encounters, and therefore potential mortality, with the herring fleet. The impact of these closed areas are difficult to determine at this time, however, due to the difficultly in determining fleet behavior as a result of the closures. It is possible that the overall magnitude of the effort will not decrease, but rather be displaced to the outside of the closed areas. This would provide areas of safety for protected species, but may not deter the overall effort and therefore the overall probability of a herring vessel encountering a protected species. Therefore in comparison to Alternative 1, the No Action Alternative, it is difficult to determine the impact of this action which will remove herring fleet effort in certain areas at certain times. In comparison to Alternatives 2 through 4, the action may provide protection rather than information gathering benefits for protected resources, and the benefit varies from species to species, depending on the information needed. Overall, the extent of the impact will depend on the behavior of the fleet outside of the closed areas.

6.5.6 Impacts on Fishery-Related Businesses and Communities

The ***Preferred Alternative*** proposes to apply the Closed Area I sampling provisions with 100% observer coverage to all midwater trawl vessels fishing in the year-round closed areas. If the groundfish year-round closed areas are modified and/or eliminated in the future, access by midwater trawl vessels will be considered accordingly in the related groundfish action. This amendment also proposes 100% observer coverage for Category A and B herring vessels (Catch Monitoring At-Sea, Section 3.2.1.2), with full sampling provisions and trip termination measures in all areas of the fishery for all limited access herring vessels (Measures to Address Net Slippage, Section 3.2.3.4). The measures proposed to apply in the year-round groundfish closed areas would include slightly different sampling provisions (more closely mirroring Closed Area I) in these areas and would extend the observer coverage requirements to Category C herring vessels fishing with midwater trawl gear.

Alternatives 1 and 2:

Alternative 1 would maintain the measures in place that currently govern the Atlantic herring fishery and the associated fishery-related businesses and communities. There are no additional impacts on fishery-related businesses and communities expected under Alternative 1, so the impacts of Alternative 1 are *neutral*.

Alternative 2 would eliminate the Closed Area I sampling provisions and the requirement that vessels take an observer on any trip that may enter Closed Area I. This alternative represents a less restrictive alternative than Alternative 1 (no action). This alternative would potentially have positive impacts on fishery-related businesses and communities because it increases flexibility and fishing opportunities while decreasing the regulatory burden associated with fishing in Closed Area I. This alternative eliminates the pre-trip notification to request an observer to fish in Closed Area I, eliminates the requirement to carry an observer in CAI, and eliminates the sampling requirements in CAI (all fish must be pumped aboard the vessel for sampling). The impact of this alternative on fishery-related businesses and communities, overall, is *potentially positive*.

Alternative 3 (100% Observer Coverage):

Relative to the no action alternative, midwater trawl vessels fishing in Closed Area I would not be impacted by implementation of Alternative 3 because 100% observer coverage is already required in Closed Area I. However, fishing vessels operating in Closed Area II, Cashes Ledge, Nantucket Lightship or the Western Gulf of Maine Closed areas would likely be impacted, depending on the source of funding of observer coverage. Under the no action alternative, vessels fishing in these areas would not be required to carry an observer unless one is deployed by NMFS; based on recent coverage rates, it is likely that 30% (or more) of trips in these areas would be allocated an observer.

Table 194 characterizes the spatial distribution of the midwater trawl directed Atlantic herring fishery relative to the five year-round groundfish closed areas in 2010. The data in Table 194 were pulled from 2005-2010 based on midwater trawl trips landing 2,000 pounds or more Atlantic herring. Currently, approximately 9-12% of herring fishing (as measured by revenues, catch, and fishing effort) occur in the five multispecies year-round closed areas. Five to seven percent (5-7%) of fishing occurs in the four multispecies closed areas in which there are currently no additional regulations on herring fishing.

Table 194 Herring Fishing Effort and Revenues in the Groundfish Closed Areas in 2010

	Cashes Ledge	Closed Area I	Closed Area II	NLSCA	Western GOM	Subtotal CA's	Open Areas	Total
Fishing Time (hours)	182	462	140	62	269	1,115	10,991	12,105
Herring Catch (000's lbs)	2,080.4	4,739	1,738.9	2,178.7	3,518.7	14,255.6	109,848.2	124,103.8
Herring Revenue (000's of $)	$320.3	$718.3	$282.8	$128.2	$483.2	1,932.9	$13,687.8	$15,620.7
	Cashes Ledge	**Closed Area I**	**Closed Area II**	**NLSCA**	**Western GOM**	**Subtotal CA's**	**Open Areas**	**Grand Total**
Fishing Time (hours)	1.5%	3.8%	1.2%	0.5%	2.2%	9.2%	90.8%	100%
Herring Catch	1.7%	3.8%	1.4%	1.8%	2.8%	11.5%	88.5%	100%
Herring Revenue	2.1%	4.6%	1.8%	0.8%	3.1%	12.4%	87.6%	100%

During the 2010 fishing year, 102 midwater trawl trips went into the Multispecies Closed Areas; however, 64 of these trips did not fish in Closed Area I. A total of 212 observer days are estimated to be required for 100% coverage of the non-Closed Area I trips (see Table 195 – days estimates based on VTR records for the identified trips).

Using $1,200 per NEFOP-day as the cost of a day of monitoring, the total costs of this observer coverage is estimated at $254,400. However, based on observer days allocated through the current SBRM process, the midwater trawl fleet is likely to receive about 30% coverage. Therefore, the additional impacts to the fishing industry are likely to be approximately $169,000 if industry-funded observers are utilized to cover the additional cost in the groundfish closed areas (see 6.2 for more information). If observer coverage is industry-funded, it is possible that herring vessels will avoid fishing in these areas more often (depending on markets, fish availability, fuel prices, and other factors) because fishing in the groundfish closed areas

would be more expensive. Overall, the impact of this alternative on fishery-related businesses and communities is potentially *low negative*.

Table 195 Number of Trips and Observer Days Projected for 100% Coverage in Year-Round Groundfish Closed Areas

Area	Number of Trips	Number of Observer Days
Closed Area I	37	148
Closed Area II	18	59
Cashes Ledge	14	45
Nantucket Lightship	8	22
Western Gulf of Maine	25	89
Total (not including CAI)	**64**	**212**

Alternative 4 (*Preferred Alternative* – Closed Area I Sampling Provisions):

The expected impacts of Alternative 4A (Preferred) are similar to the expected impacts of Alternative 3 because this option requires 100% observer coverage in all of the groundfish closed areas. Restrictions on fishing practices as a result of the additional requirements are likely to increase costs of fishing slightly. The other potential impact is diminishing flexibility since the vessel operator would be required to provide notice if fishing in any of the year-round closed areas was contemplated. The requirement that a vessel must leave a Closed Area acts as a disincentive to slip a nets; however, this requirement may not promote safety-at-sea. Restrictions on fishing practices are likely to increase costs of fishing slightly relative to the status quo. Under alternative 4B, no additional observer coverage in the closed areas are mandated. The overall impact of this alternative on fishery-related businesses and communities, therefore, is *potentially low negative*.

Alternative 5 (Closed Areas):

This alternative closes the year-round groundfish closed areas to midwater trawl vessels participating in the herring fishery. Under this alternative, access to groundfish closed areas by midwater trawl vessels (single and paired) that are not declared out of the fishery (DOF) would be prohibited except with an experimental fishing permit (EFP).

This alternative would likely reduce revenues for the midwater trawl fishery. Under Alternative 5, the number of midwater trawl trips would likely also decrease. While 12% of revenues for the midwater trawl fishery were located in the five closed areas (see Table 194), this effort and revenue is not likely to completely disappear. Instead, the midwater fleet is likely to fish in other, less productive areas. This will increase costs for the fleet. The purse seine fleet is likely to benefit from additional catch due to the exclusion of trawl gear from the Western Gulf of Maine Closed Area portion of Area 1A. Overall, the impacts of Alternative 5 on fishery-related businesses and communities is expected to be *negative*.

The impacts of closing the year-round groundfish closed areas to midwater trawl vessels participating in the herring fishery unless they have an experimental fishing permit (EFP) would depend largely on what provisions were included in the EFP. The proposed provisions include full observer coverage and/or electronic monitoring, both of which have high associated costs that might make fishing in the closed areas prohibitively expensive. In addition, if pair trawling is prohibited and midwater trawl trips are limited, compensation may not be sufficient to pay for the added costs.

6.6 CUMULATIVE EFFECTS ANALYSIS

6.6.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but, rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Framework 46 together with past, present, and reasonably foreseeable future actions that affect the herring environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

6.6.2 Valued Ecosystem Components (VECs)

Consistent with the guidelines for CEA, cumulative effects can be more easily identified by analyzing the impacts of the Proposed Action on valued ecosystem components (VECs). The affected environment is described in this document based on VECs that were identified for consideration relative to the proposed specifications. The VECs described in this document and considered in this CEA are listed below.

VECs represent the resources, areas, and human communities that may be affected by a Proposed Action or alternatives and by other actions that have occurred or will occur outside the Proposed Action. VECs are generally the "place" where the impacts of management actions are exhibited. An analysis of impacts is performed on each VEC to assess whether the direct/indirect effects of an alternative adds to or subtracts from the effects that are already affecting the VEC from past, present and future actions outside of the Proposed Action (i.e., cumulative effects).

The Affected Environment is described in this document based on VECs that were identified specifically for Amendment 5. The VECs for consideration in Amendment 5 include:

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

Changes to the Herring FMP have potential to directly affect the Atlantic herring resource. Similarly, management actions that would alter the distribution and magnitude of fishing effort for herring could directly or indirectly affect non-target species and other fisheries, which, for this amendment, 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 Amendment 5 (Section 5.0 of this document) traces the history of each VEC since the implementation of Amendment 1 to the Herring FMP (in 2006) and consequently addresses the impacts of past actions. The Affected Environment section is designed to enhance the readers' understanding of the historical, current, and near-future conditions (baselines and trends) in order to fully understand the anticipated environmental impacts of the management alternatives and independent measures under consideration in this amendment. The direct/indirect and cumulative impacts of these alternatives and measures are then assessed in Section 6.0 of this document using a similar structure to that found in the Affected Environment. This EIS, therefore, 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 are used to summarize impacts:

Table 196 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		

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

6.6.3 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 5.0 of this Amendment 5 (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 GOM 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. This

FMP serves as the primary management action for the Atlantic herring fishery and has helped to shape the current condition of the resource.

The temporal scope of future actions for all VECs, which includes the Amendment 5, extends five years into the future. 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 Herring FMP, should the resource become overfished and subject to a rebuilding program in the future.

6.6.4 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 immediately below in Table 198. The baseline conditions of the resources and human community are subsequently summarized 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 amendment is included. The culmination of all these factors is considered when making the cumulative effects assessment.

6.6.5 Past, Present, and Reasonably Foreseeable Future Actions

Table 198 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 198 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.

6.6.5.1 Atlantic Herring

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 herring resource is updated in Section 5.1 of this document, and the herring fishery is summarized in Section 5.5 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, and recent survey trends in the inshore Gulf of Maine are declining. Additional past and present actions that affect the herring resource are discussed in the other VEC sections.

The ASMFC adopted Amendment 2 in March of 2006 to herring management in state waters 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 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 MSRA. The addendum also established a new specification setting process that is more in line with the ASMFC 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 ACLs by first defining terms to bring the FMP into compliance with the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing sub-ACLs, and establishing the Specifications Process to utilize these elements. Three Accountability Measures (AMs) were also established: one which closed the fishery when there is a projection that 95% of the sub-ACL will be reached, one which subtracts the amount of an ACL overage from subsequent ACLs, and another which established a haddock catch cap.

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 2013-2015 Atlantic herring fishery specifications process will set the specifications for the Atlantic Herring fishery for those fishing years, which will rely primarily on information from a Benchmark Assessment, SAW 54 (June 2012), as well as information from the Herring PDT. The action will likely be beneficial to the Atlantic Herring resource as in accordance with the reauthorized Magnuson-Stevens Act, which was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. The cumulative impacts of the future Specifications Process on the VECs should therefore be expected to result in positive long-term outcomes.

In addition, at its November 2012 meeting, the Council identified management actions to establish river herring catch caps and implement industry-funded catch monitoring provisions as priorities for 2013, so work is expected to begin once the 2013-2015 fishery specifications are completed. The Council also prioritized an amendment to consider river herring and shad as stocks in the Atlantic herring fishery once those actions are developed. While the impacts of the specific actions cannot be predicted because the details have yet to be contemplated, all of the actions build on the management strategy adopted in the Herring FMP and enhanced by this and other management actions, so the impacts are likely to be positive on the Atlantic herring resource.

Omnibus EFH Amendment is likely to be implemented in 2013. 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 (74 FR 36058, July 21, 2009). 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 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. This measure is likely to be neutral for the herring resource as it will not affect herring directly.

6.6.5.2 Non-Target Species and Other Fisheries

Past and Present Actions: This section serves to summarize the past and present management measures that may have impacted non-target species and other fisheries; a more lengthy summary of river herring measures can be found in Section 5.2.2.1, for mackerel in Section 5.2.2.2, and for groundfish in Section 5.2.2.3.

Figure 55 and Figure 56 present an overview of actions that have applied to river herring in recent years. 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 ACLs by first defining terms to bring the FMP into compliance with the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing sub-ACLs, and establishing the Specifications Process to utilize these elements. Three Accountability Measures (AMs) were also established: one which closed the fishery when there is a projection that 95% of the sub-ACL will be reached, one which subtracts the amount of an ACL overage from subsequent ACLs, and another which established a haddock catch cap.

Reasonably Foreseeable Future Actions: 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 197. Similarly, the timelines for both this Amendment and Amendment 14 were designed to complement each other and allow public comment sessions to occur simultaneously.

Table 197 Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

VESSEL REPORTING MEASURES

Measure	MSB Amendment 14	Herring Amendment 5	Preferred Alternatives/ Consistency Issues
Weekly VTR	• 1bMack: All mackerel permits • 1bLong: Longfin/butterfish moratorium permit • 1c: all MSB permits	• Existing: Weekly VTR requirement for all herring permits recently implemented by NMFS (76 FR 54385; September 1, 2011)	
Pre-trip notification to observer program	• 1d48: 48 hr prior to trip for mackerel permits • 1d72: 72 hr prior to trip for mackerel permits	• Existing: 72-hr requirement for Cat A/B permits on declared herring trip with midwater trawl /purse seine gear • Existing: 72-hr requirement for Cat C/D permits using midwater trawl gear in Areas 1A, 1B, or 3 (NE Multispecies FW 46) • Section 3.1.4.2: 48-hr requirement for all limited access herring permits and herring carrier LOAs	• Amendment 5 proposes a 48-hour notification requirement for limited access herring vessels • Preferred Alternatives are 48-hour pre-trip notification requirements
VMS requirement	• 1eMack: Limited access mackerel permits • 1eLong: Longfin/butterfish moratorium permits	• Existing: VMS already required for limited access herring permits • Existing: VMS trip declaration required for limited access herring permits • Section 3.1.4.2: Gear declaration for all limited access herring permits	
VMS catch reporting	• 1fMack: Daily for limited access mackerel vessels • 1fLong: Daily for Longfin/butterfish moratorium permits	• Existing: Daily VMS requirement for all limited access herring permits recently implemented by NMFS (76 FR 54385; September 1, 2011)	
Pre-landing notification	• 1gMack: 6-hr pre-land via VMS to land over 20,000 lb mackerel • 1gLong: 6-hr pre-land via VMS to land over 2,500 lb longfin	• Existing: 6-hr pre-landing requirement for Cat A/B permits on declared herring trip with midwater trawl /purse seine gear • Existing: 6-hr requirement for Cat C permits using midwater trawl gear in Areas 1A, 1B, or 3 (NE Multispecies FW 46) • Section 3.1.4.3: 6-hr requirement for all limited access herring permits and herring carrier LOAs	

Table 197 continued. Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

DEALER REPORTING MEASURES

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Preferred Alternatives/ Consistency Issues
SAFIS dealer and vessel counter- signature	• 2b: Landings over 20,000 lb mackerel; 2,500 lb longfin; or 10,000 lb *Illex*	• Section 3.1.5.2, Sub-Option 2C: All herring landings	• NEFMC Preferred Alternative is 2B
Dealers must weigh all fish, and document estimation of relative composition annually on dealer application if not sorted	• 2c: over 20,000 lb mackerel • 2e: over 2,500 lb longfin	• Section 3.1.5.2, Sub-Option 2A: All herring landings	
Dealers must weigh all fish, and document estimation of relative composition at each transaction if not sorted	• 2d: over 20,000 lb mackerel • 2f: over 2,500 lb longfin	• Section 3.1.5.2, Sub-Option 2B: All herring landings	
Allow volume to weight conversions	• 2g: allow volume to weight conversions if dealers cannot weigh catch	• Section 3.1.5.2, Sub-Options 2A and 2B: Neither of these alternatives exclude the use of volume to weight conversions	

AT-SEA OBSERVER OPTIMIZATION MEASURES

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Preferred Alternatives/ Consistency Issues
Safe Sampling Station	• 3b	• Section 3.2.2.2, Sub-Option 2A	
Reasonable Assistance	• 3b	• Section 3.2.2.2, Sub-Option 2B	
Haul back notice to observers	• 3c	• Section 3.2.2.2, Sub-Option 2C	
Observers on any vessel taking on fish whenever and wherever possible	• 3d	• Section 3.2.2.2, Sub-Option 2D	
Pair Trawl Communication	• NONE	• Section 3.2.2.2, Sub-Option 2E	
Visual Access to Codend	• Included in 3f and 3g	• Section 3.2.2.2, Sub-Option 2F	

Table 197 continued. Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

AT-SEA OBSERVER OPTIMIZATION MEASURES

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Preferred Alternatives/ Consistency Issues
Slippage reports/affidavit from vessel operator	• 3e	• Section 3.2.3.2	• Measures proposed to address net slippage are slightly different between Amendment 5 (4C with 10 events) and Amendment 14
Vessels with observers prohibited from releasing discards before they a brought aboard for sampling	• 3f: mackerel vessels • 3g: longfin vessels	• NONE	
Trip termination following slippage on observed trip	• 3h: after 1 slipped haul • 3i: after 2 slipped hauls	• Section 3.2.3.4, Option 4A	
Closed Area I Provisions	• 3j: No trip termination	• Section 3.2.3.3	
Closed Area I Provisions with Trip Termination	• 3k: mackerel vessels, may be selected with 3j; trip termination for every observed slippage event after 5 events • 3l: mackerel vessels, same as 3k but after 10 events • 3m: Same as 3k but for longfin vessels • 3n: Same as 3l but for longfin vessels	• Section 3.2.3.4, Option 4C; after 10 events • Section 3.2.3.4, Option 4D; after 5 events • *Preferred Alternative is 4D, after 10 events by gear type and management area	
Closed Area I Provisions with Trip Termination and Catch Deduction	NONE	• Section 3.2.3.4, Option 4B; assumed that 100,000 lb herring caught in each slipped haul, catch deducted from area sub-ACL	
Annual slippage quota for individual vessels	• 3p: mackerel/longfin vessels assigned annual slippage quota; trip termination on every slippage event after quota attained.	NONE	

Table 197 continued. Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

AT-SEA OBSERVER COVERAGE REQUIREMENTS

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5	Preferred Alternatives/ Consistency Issues
Percentage-Based	• 5b: Mackerel MWT; 25%, 50%, 75%, and 100% options • 5c: Mackerel SMBT; 25%, 50%, 75%, and 100% options • 5d: Longfin SMBT; 25%, 50%, 75%, and 100% options	• Section 3.2.1.2, only 100%	• Similar coverage rates proposed in both amendments • Similar provisions for industry-funded component of monitoring program, TBD in cooperation with NMFS following Amendment 5
Coverage Levels to Achieve Target CVs	• 5e1: CV below 0.3 for RH species for MWT • 5e2: CV below 0.2 for RH species for MWT • 5e3: CV below 0.3 for RH species for SMBT • 5e4: CV below 0.2 for RH species for SMBT	• Section 3.2.1.4: CV below 0.2 for river herring, and below 0.3 for Atlantic herring and haddock	
Modified SBRM	• NONE	• Section 3.2.1.3	
Funding Alternatives	• 5f: Vessels pay for observers greater than existing sea day allocation • 5g: Phase-in industry funding over 4 yrs., NMFS would pay for 100%, then 75%, 50%, 25%	• Funding options (Federal or Federal and Industry) are specified within above alternatives	

Table 197 continued. Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

MEASURES TO ADDRESS PORTSIDE SAMPLING

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Preferred Alternatives/ Consistency Issues
Industry-funded 3rd party port-side sampling program	• 4b: landings over 20,000 lb mackerel • 4c: Landings over 2,500 lb longfin	NONE	
Vessel hold volume certification	• 4d: Tier 3 mackerel • 4e: Longfin/Butterfish moratorium	NONE	

RIVER HERRING CATCH CAPS

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Preferred Alternatives/ Consistency Issues
Mortality Caps	• 6b: River herring for the mackerel fishery • 6c: Shads for the mackerel fishery • 6d: River herring for the longfin fishery • 6e: Shads for the longfin fishery	• Section 3.3.5: Mechanism to establish River herring catch caps through Framework adjustment or specifications package in the future after a RH stock assessment is completed	• Both amendments authorize catch caps for river herring
Caps added through a future framework	• 6f	• Section 3.3.5: River herring (same as above)	None

ADD RH/S AS STOCKS IN THE FISHERY

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative and description)	Preferred Alternatives/ Consistency Issues
Add as stock in MSB fishery, would confer full Magnuson-Stevens benefits, i.e. ACLs/AMs and EFH	• 9a: blueback • 9b: alewife • 9c: American shad • 9d: hickory shad	NONE	• Future amendments

Table 197 continued. Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)

RESTRICTIONS IN AREAS OF HIGH RH/S CATCH

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative and description)	Preferred Alternatives/ Consistency Issues
Closed Area Alternatives	• 7bMack: Q1 prohibition on retention of more than 20,000 lb mackerel in management area • 7bLong: Full year prohibition on retention of more than 2,500 lb longfin in management area • 8eMack: Possession over 20,000 lb mackerel prohibited in Am5 Protection Areas (bimonthly closures) • 8eLong: Possession over 2,500 lb longfin prohibited in Am5 Protection Areas (bimonthly closures)	• Section 3.3.3.2.1, bimonthly closure areas	
Observers Required in Management Areas	• 7cMack: required to possesses over 20,000 lb mackerel; industry funded • 7cLong: required to possess over 2,500 lb longfin; industry funded • 8cMack: Same monitoring/avoidance areas as Am 5; required to possess over 20,000 lb mackerel • 8cLong: Same monitoring/avoidance areas as Am 5; required to possess over 2,400 lb longfin	• Section 3.3.2.2.1, with sub-options to apply this provision either to just limited access permits (A) or all permits (B)	
Closed Area I Provisions	• 8dMack: in Am 5 monitoring/avoidance areas • 8dLong: in Am 5 monitoring/avoidance areas	• Section 3.3.2.2.2, with sub-options to apply this provision either to just limited access permits (A) or all permits (B)	
Above requirements with mortality trigger	• 7d for Alt Set 7 • 8f for Alt Set 8	• Section 3.3.2.2.3 for observer coverage or Closed Area I provisions • Section 3.3.3.2.2 for closed areas	
Formally review results of SFC bycatch avoidance program, and possibly incorporate by framework	• 4f	• Section 3.3.2.2.4	
Mechanism to adjust areas (specifications)	• 7e: bi-annually	• Section 3.3.4: every 3 years or during interim years through a revised specs package	

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 Section 5.2.2.2.

At the time, it is not known how the 2013-2015 herring fishery specifications process will impact non-target species and other fisheries. The specifications process will set the specifications for the Atlantic Herring fishery for 2013-2015, which will rely primarily on information from SAW 54 (June 2012) to inform decision making, in addition to information from the PDT. The action will likely be beneficial to the Atlantic Herring resource, as in accordance with the reauthorized Magnuson-Stevens Act, which was enacted to promote long-term positive impacts on the environment in the context of fisheries activities; as an extension, it may therefore also be beneficial to non-target and other fisheries by reducing effort on those stocks. Conversely, effort on other species and fisheries my increase if the specifications are set low enough that other species are targeted to maintain revenue as a result. The cumulative impacts of the future specifications process on non-target and other species is therefore also difficult to predict at this time.

At its November 2012 meeting, the Council identified management actions to establish river herring catch caps and implement industry-funded catch monitoring provisions as priorities for 2013, so work is expected to begin once the 2013-2015 fishery specifications are completed. The Council also prioritized an amendment to consider river herring and shad as stocks in the Atlantic herring fishery once those actions are developed. While the impacts of the specific actions cannot be predicted because the details have yet to be contemplated, all of the actions build on the management strategy adopted in the Herring FMP and enhanced by this and other management actions, so the impacts are likely to be positive on non-target species and other fisheries, particularly river herring and shad.

Implementation of the Omnibus EFH Amendment may also result in additional habitat protections for which there is an indirect positive effect to bycatch species, 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 codend.

6.6.5.3 Physical Environment and Essential Fish Habitat (EFH)

Past and Present Actions: The Herring EFH designation, which was developed as part of an Omnibus EFH Amendment prepared by NEFMC for all its managed species, is reproduced in Section 0 of this document. The Omnibus EFH 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 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.

At the time, it is not known how the 2012-2015 Specifications Process will impact EFH. The Specifications Process will set the specifications for the Atlantic Herring fishery for 2012-2015, which will rely primarily on information from SAW 54 (June 2012) to inform decision making, in addition to information from the PDT. The action will likely be beneficial to the Atlantic Herring resource, as in accordance with the reauthorized Magnuson-Stevens Act , which was enacted to promote long-term positive impacts on the environment in the context of fisheries activities; as an extension, it may therefore also be beneficial to EFH by reducing effort in those areas, but the cumulative impacts of the future Specifications Process on EFH is difficult to predict at this time, as the changes to the fishery are unknown.

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.

6.6.5.4 Protected Resources

A general description of protected species that may be affected by the Proposed Action is provided in Section 5.4 of this document and in more detail in Amendment 1 and Amendment 4 to the 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. 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 in debris or ingestion of marine debris are also seen as possible threats.

Reasonably Foreseeable Future Actions: At the time, it is not known how the 2012-2015 Specifications Process will impact protected resources. The Specifications Process will set the specifications for the Atlantic Herring fishery for 2012-2015, which will rely primarily on information from SAW 54 (June 2012) to inform decision making, in addition to information from the PDT. The action will likely be beneficial to the Atlantic herring resource, as in accordance with the reauthorized Magnuson-Stevens Act, which was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. One way in which the specifications process my benefit the Atlantic Herring resource is by reducing effort. As an extension, it may therefore also be beneficial to protected resources by reducing effort in those areas which they are located; the cumulative impacts of the future Specifications Process on protected resources is difficult to predict at this time, however, as the changes to the fishery are as yet unknown.

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 final rule in February 2010 indicating additional management restrictions for gillnetters. Future measures 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. More information regarding the 2010 amendment to the HPTRP can be found in Section 5.4 of this document.

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.

6.6.5.5 Fishery-Related Businesses and Communities

Past and Present Actions: In 2010, the ASMFC adopted an Addendum which modified Amendment 1 (Amendment 1) and Amendment 2 (Amendment 2) to the Interstate Fisheries Management Plan for Atlantic 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 MSRA. The addendum also established a new specification setting process that is more in line with the ASMFC 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 ACLs by first defining terms to bring the FMP into compliance with the MSA, setting an interim ABC control rule, eliminating JVP, IWP, TALFF and reserve specifications, establishing sub-ACLs, and establishing the Specifications Process to utilize these elements. Three Accountability Measures (AMs) were also established: one which closed the fishery when there is a projection that 95% of the sub-ACL will be reached, one which subtracts the amount of an ACL overage from subsequent ACLs, and another which established a haddock catch cap.

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: 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 197. Similarly, the

timelines for both this Amendment and Amendment 14 were designed to complement each other and allow public comment sessions to occur simultaneously.

The 2013-2015 herring fishery specifications process will set the specifications for the Atlantic Herring fishery for those years, which will rely primarily on information from SAW 54 (June 2012), to inform it, as well as information from the Herring PDT. The action will likely be beneficial to the Atlantic herring resource as in accordance with the reauthorized Magnuson-Stevens Act, which was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, it will likely comply with a set of National Standards that collectively serve to optimize the conditions of the human environment, which will benefit both fishery-related business and communities. The cumulative impacts of the future Federal fishery management actions on them should therefore be expected to result in positive long-term outcomes. Nevertheless, Specifications Process may be associated with offsetting impacts, such as constraining fishing effort, which frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are necessary to bring about the long-term sustainability of a given resource and as such should, in the long-term, promote positive effects on both fishery-related businesses and communities, especially those that are economically dependent upon the managed resource.

Implementation of the Omnibus EFH Amendment may result in additional habitat protections, which may or may not effect 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.

Table 198 Summary Effects of Past, Present, and Reasonably Foreseeable Future Actions on the VECs Identified for Amendment 5

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

6.6.6 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. The following table (Table 199) summarizes the added effects of the condition of the VECs (i.e., status/trends from Section 5.0) and the sum effect of the past, present and reasonably foreseeable future actions (from Section 6.6.5 above). The resulting CEA baseline for each VEC is exhibited in Table 198. 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 given in Section 5.0 of this document.

Table 199 Cumulative Effects Assessment Baseline Conditions of the VECs

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 198)	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		

Table 199 Cumulative Effects Assessment Baseline Conditions of the VECs, continued

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 198)	Combined CEA Baseline Conditions
Habitat and EFH		Fishing impacts are complex and variable and typically adverse (see Section 5.5); 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.
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

6.6.7 Summary of Impacts from Amendment 5 Alternatives

The following tables summarize the impacts of the management options that were considered in Amendment 5, as well as the ***Preferred Alternative,*** on each of the VECs identified in this amendment and described in the Affected Environment. Some additional discussion regarding the cumulative impacts of the proposed alternatives/ on fishery-related businesses and communities is also provided following the tables, with more specific focus on social impacts.

This table has been updated from the Amendment 5 Draft EIS based on new/updated information provided in this document, and also to include more specific characterization of the Council's ***Preferred Alternatives***.

Measure Description	Potential Impacts of the Proposed Adjustments to the Fishery Management Plan (Section 3.1)			
	VEC 1: Atlantic Herring	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.1.1, Regulatory Definitions: Proposed regulatory definitions for *offload* and *transfer at sea*	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled
Section 3.1.2, Administrative/General Provisions: -Expand possession limits to vessels working cooperatively -Eliminate the VMS power down provision - At-sea Dealer Permit	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Measures are administrative and not likely to affect the amount of herring for harvest or fishing effort, but may improve catch reporting by clarifying how catch is handled
Section 3.1.3, Carrier Vessels: Option 2 - allow carriers to declare in/out through VMS to eliminate the 7-day minimum enrollment Option 3 - dual option allows SQ for carriers with no VMS	Neutral Measures not likely to affect the amount of herring for harvest or fishing effort	Neutral Measures not likely to affect non-target species encountered in the herring fishery	Neutral Measures not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Negative/Low Positive Option 2 would increase flexibility for limited access vessel but may negatively impact open access vessels that would need to purchase ($1,750-$3,300) and operate ($40-$100/month) a VMS; Option 3 increases flexibility for all vessels without the additional cost of purchasing/ operating a VMS
Section 3.1.3.3, Transfers at Sea: Option 2 - Category A and B vessels only Option 3 - prohibit transfers to non-permitted vessels ****The Council selected Option 1 (No Action) – expected to have neutral impacts across all VECs (see discussion)***	Low Positive Measures not likely to affect the amount of herring for harvest or fishing effort; transfers at sea represent small component of fishery, but options under consideration may improve catch monitoring	Neutral Measures not likely to affect non-target species encountered in the herring fishery	Neutral Measures not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Negative Option 2 decreases flexibility of Category C and D vessels; Option 3 decreases flexibility for all herring vessels by prohibiting vessels from selling herring at sea as lobster bait; Options 2 and 3 increase reporting burden but should have minimal negative economic impacts as less than 0.5% of catch is transferred at sea

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Proposed Adjustments to the Fishery Management Plan (Section 3.1) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Business and Communities
Section 3.1.4: Trip Notification Requirements Option 2 - modify/extend pre-trip notification requirements and add VMS gear declaration Option 3 - extend pre-landing notification requirement	Low Positive Herring harvest or fishing effort is not expected to change, but catch accounting and/or the tracking of catch may improve; either may improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery	Neutral Measures are administrative and not likely to affect non-target species encountered in the herring fishery	Neutral Measures are administrative and not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Low Positive Options 2 and 3 will increase reporting burden, but measures should provide consistency regarding which vessels are subject to the pre-trip and pre-landing notifications and extending notification requirements will likely improve allocation of observer coverage and management uncertainty can therefore be reduced.
Section 3.1.5: Reporting Requirements for Federally Permitted Dealers Option 2 - require dealers to weigh all fish Sub-Option 2A and 2B– requirement for annual/weekly reporting of catch composition estimation method Sub-Option 2C – vessel owner/operator confirmation of SAFIS	Neutral/Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; sub-options may provide more information	Neutral/Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; sub-options may provide more information	Neutral Measures are not likely to affect EFH or Protected Resources; Sub-Options is not likely to improve separation of protected resources	Neutral Sub-Option 2A/2B Low Negative Sub-Option 2C Low Positive Option 2 does not require dealers to use any particular method to accurately weigh all fish; dealers are therefore unlikely to change their behavior under Option 2, in comparison to the no action alternative; Sub-Options 2A/2B would require extra time and effort for owner/operators; 2C may improve quality of data, resulting in better monitoring against sub-ACLs (potential economic benefit)
Section 3.1.6: Changes to Open Access Provisions for Limited Access Mackerel Vessels in Areas 2/3 Option 2 - 20K pound possession limit of LA mackerel vessels with OA herring permit Option 3 - 10K pound possession limit option for LA mackerel vessels with OA herring permit	Neutral Increases the potential for targeted fishing for herring in SNE and MA areas; should not be a concern for herring because of quota management (controls F) but impact on inshore stock depends on timing of catch and stock component mixing	Unknown Impacts will depend largely on how many vessels/which tiers the Council agrees to apply these options to; will also depend on if additional measures are implemented to monitor or manage the catch of non-target species in the times and areas where vessels with the new mackerel permit may fish	Neutral Increase in effort may lead to more encounters with EFH and/or Protected Resources, however the effort increase is expected to be minimal based on the magnitude of the overall fishery	Positive Could decrease the occurrence of regulatory discards and increase revenues for vessels that qualify for this permit category; vast majority of mackerel are landed by vessels which are not subject to the 3 mt possession limit; equity issue between LA herring and mackerel permit holders may be resolved by permitting similar levels of non-directed catch in both fisheries

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2)			
	VEC 1: Atlantic Herring	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Business and Communities**
Section 3.2.1.2, Alternative 2 - 100% Observer Coverage: Funding Option 2 - federal and industry funds States as Service Providers Option 2 - states authorized ****The Council selected this alternative for A/B vessels only, with industry funding starting in Year 2, target max $325/day; review coverage after 2 years***	Positive Benefits to resource would be highest under this alternative because it increases the likelihood of better documenting herring catch the most; may improve the precision of estimates of discards and/or landed bycatch; long-term effects may have low positive effects; relationship between observer coverage and precision important to consider at high levels of coverage	Positive Benefits from significant increase in sampling and coverage, which should lower CVs and increase precision of bycatch estimates in the herring fishery; relationship between observer coverage and precision important to consider at high levels of coverage	Neutral/Low Positive Measures are not likely to affect EFH; the effects to Protected Resources result from significant increase in sampling and observer coverage	Potentially High Negative Likely to create negative impacts on herring-related businesses or communities to the extent that Federal funds cannot pay for the additional observer coverage; full cost of 100% coverage of the A/B/C herring fishery is likely to be approximately $2.5M per year; costs of ***Preferred Alternative*** mitigated by limiting to A/B vessels only, phasing-in industry funding, and reviewing after two years
Section 3.2.1.3, Alternative 3 – Require SBRM Coverage Levels as Minimum: Funding Option 2 - federal and industry funds	Unknown/Potentially Low Positive Unclear how observer allocations may differ from the status quo; if sampling increases, may improve the precision of estimates of discards and/or landed bycatch; have low positive long-term effects	Unknown/Neutral Unclear how observer allocations may differ from the status quo; if sampling increases, will only affect a minor component of Northeast Region fisheries	Neutral/Unknown Measures are not likely to affect EFH or Protected Resources that may be encountered by the herring fishery	Unknown/Potentially Low Negative Similar to status quo; unclear what additional coverage would result from adopting this approach; would negatively affect fishery-related businesses if industry has to pay for additional coverage
Section 3.2.1.4, Alternative 4 - Council Specified Targets: Funding Option 2 - federal and industry funds	Low Positive May improve the precision of estimates of discards and/or landed bycatch; long-term effects may have low positive effects	Positive Allocation of additional observer coverage of river herring and haddock may lead to a great understanding and reliability of their bycatch estimates; would not impact the SBRM allocation scheme, and would therefore not cause other fisheries to be under-sampled	Neutral/Low Positive Measures are not likely to affect EFH; Protected Resources may benefit from additional monitoring	Potentially Negative Impacts depend on funding options for observer coverage; would negatively impact herring-related businesses if the industry has to pay for coverage; depends on the Council-specified targets/priorities

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Businesses and Communities
Section 3.2.2.2, Additional Measures Improve Sampling: Option 2A - requirements for a safe sampling station Option 2B - requirements for reasonable assistance Option 2C - requirements to provide notice Option 2D - requirements for trips with multiple vessels Option 2E - pair trawl communication Option 2F - visual access to net/codend	Neutral May have little impact on the Atlantic herring resource; several of the measures may provide some additional information on the contents of slipped nets, discards, and landed catch, but likely to be qualitative	Neutral Several of the measures may provide some additional information on the contents of slipped nets, discards, and landed catch, but likely to be qualitative and not likely to affect the outcome of future assessments of non-target species	Neutral Measures are not likely to affect EFH or Protected Resources	Neutral Minimal direct economic impacts on the herring fishery; the proposed steps for improving or maximizing sampling at sea are currently a part of every herring vessels' normal operating practices, according to interviewed captains; it is unknown how this measure may affect purse seine operations; any economic impacts to the herring fishery will be through increased administrative and regulatory burden, but expected to be slight
Section 3.2.3.2, Measures to Address Net Slippage: Option 2 - require released catch affidavit for slippage events	Unknown May improve accounting of Atlantic herring catch but still represents an estimate; may therefore be redundant and unlikely to affect herring resource	Neutral May improve accounting of non-target species/other fisheries catch, but still represents an estimate	Neutral Released catch affidavits are not likely to affect EFH or Protected Resources	Neutral Minimal impacts on the directed herring fishery
Section 3.2.3.3, Measures to Address Net Slippage: Option 3 - CAI Sampling Provisions	Positive Likely to improve accounting of Atlantic herring catch; may improve statistics used in stock assessment and reduce uncertainty to an unknown degree	Low Positive Likely to improve accounting of non-target species/other fisheries	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Minimal direct economic impacts on the herring fishery; however there may be new challenges associated with bringing operational discards on board for some vessels; increased times spent pumping fish to be sampled and observed; it is unknown how this measure may affect purse seine operations

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Measure Description	Potential Impacts of the Catch Monitoring at Sea Alternatives (Section 3.2) Continued VEC 1: Atlantic Herring	VEC 2: Non-Target Species /Other Fisheries	VECs 3 and 4: Essential Fish Habitat and Protected Resources	VEC 5: Fishery Related Businesses and Communities
Section 3.2.3.4, Measures to Address Net Slippage: Option 4 - catch deduction (and possible trip termination) for slippage events Option 4A -catch deduction, possible trip termination Option 4B - with CAI provisions Option 4C - with CAI provisions (10 events) Option 4D - with CAI provisions (5 events) ***The Council selected Option 4C, with trip termination thresholds (10) by gear type and management area***	Low Positive Would likely result in sub-ACLs being attained more quickly with subsequent directed fishery closures occurring sooner; possible increase in herring abundance	Neutral/Potentially Low Positive Effects difficult to predict; trip termination could reduce the amount of effective fishing effort in an area throughout the course of the fishing season, thereby reducing bycatch and mortality of non-target species; the extent of the impacts will be determined by how fishing effort shifts and whether or not the fleet moves into an area(s) with a higher potential of encountering these species.	Unknown Not likely to affect EFH; impacts to Protected Resources will vary based on reaction of the fleet to the new measures	Negative Trip termination increases costs to participants; sub-ACL deductions could reduce catch and revenue, although this is likely to have an effect only in Areas 1A and 1B unless sub-ACLs are fully utilized in other areas; aggregate revenues expected to decline by $12,000-$15,000 per slippage event in areas where ACLs are fully utilize -Potential safety concerns with trip termination and measures that are perceived as punitive ***Preferred Alternative*** likely to impact purse seine vessels in Area 1A and midwater trawl vessels fishing in all areas
Section 3.2.4.2, Alternative 2: Evaluation of maximized retention through the annual issuance of exempted fishing permits ***The Council selected Option 1 (No Action) – expected to have neutral impacts across all VECs and unknown impacts on fishery-related businesses and communities (see discussion)***	Unknown/Low Positive Would likely have little effect on the herring resource because it would not affect the mortality rate exerted on the stock; dealers may record previously undocumented catch	Unknown/Low Positive Could increase the scientific knowledge available to fisheries managers about bycatch of non-target species; impacts to mackerel fishery would need to be evaluated by NMFS when the alternative is developed	Neutral Exempted fishing permits are not likely to affect EFH or Protected Resources	Unknown Could degrade the quality of the catch by damaging in while in the fish hold; retention of non-marketable fish in the hold of a vessel reduces the amount of marketable fish which can be landed; magnitude of these effects are unknown at this time.

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

Potential Impacts of the Management Measures to Address River Herring Bycatch (Section 3.3)				
Measure Description	**VEC 1: Atlantic Herring**	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.3.2.2.1, 3.3.2.2.2, and 3.3.2.2.3; Alternative 2 - Monitoring/Avoidance Management Options: Option 1 - 100% Observer Coverage Option 2 - CAI sampling provisions Option 3 - trigger based monitoring	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Potentially Positive May improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring and could lead to possible reductions in river herring mortality if the fleet avoids those areas; more monitoring may mean more bycatch/discards information in specific areas where river herring may be missed; monitoring specific areas instead of across the full range of the species may miss important river herring encounters by the fleet	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Negative Potential for increased costs associated with industry payment for observers; could trigger additional losses, thereby affecting bait supplies; slightly higher regulatory/compliance costs; indirect users of the river herring resource may benefit if higher stock levels of river herring are achieved; uncertainty of trigger mechanisms makes business planning difficult; complexity of trigger reporting options likely to be very challenging for fishery participants to provide accurate catch information in a real-time manner; impact may be mitigated for shrimp fishery and large-mesh bottom trawl vessels if exemption is approved
Section 3.3.2.2.4, Alternative 2 - Monitoring/Avoidance Management Options: Option 4 - two phase bycatch avoidance approach based on SFC project	Neutral No direct biological impact on the herring resource; indirect long-term benefits if the industry can work cooperatively to develop a long-term avoidance strategy	Potentially Positive Could be reductions in river herring mortality in the bimonthly avoidance areas; would need to be adequate incentives in place for the fleet to avoid the areas	Neutral The shift in effort is not likely to affect EFH or Protected Resources	Low Negative Collaboration with trusted institutions may allow herring fishery participants to participate in observations and facilitate monitoring/sampling that will lead to appropriate adjustments of Monitoring/Avoidance Areas and to the development of avoidance strategies; could ultimately reduce costs associated with bycatch avoidance because the industry would likely prioritize cost-effectiveness when developing strategies

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

***Amendment 5 also proposes to establish river herring catch caps in the future, through the framework adjustment or specifications process; the impacts of this provision are not reflected in the table. See Section 3.3.5 for related discussion.*

Measure Description	Potential Impacts of the Management Measures to Address River Herring Bycatch (Section 3.3)			
	VEC 1: Atlantic Herring	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.3.3.2.1, Alternative 3 - River Herring Protection: Option 1 - closed areas	Neutral Not likely to affect total removals of herring from the fishery; many of the blocks proposed for seasonal closure under Alternative 3 overlap substantially with the herring fishery, suggesting that directed herring fishing effort may be reduced, at least seasonally, in some of the areas, but the areas are small and closed for short durations; other fishing activity is likely to occur as well; no benefits to the resource are expected	Potentially Positive May provide river herring protection during at-sea migrations, leading to reductions in mortality; fixed protection areas would not provide river herring mortality protection outside of protection areas; open areas could therefore have increased river herring encounter rates, depending on year-to-year variability associated with river herring distribution	Unknown Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Decreases in revenue in the directed fishery and/or increases in costs of fishing may occur with the closures; trawl fishery participants during the winter season may experience hardship due to the overlap with Protection Areas; may be straight-forward option to enforce; economic and social costs may be incurred though the variability of the hotspots; impact may be mitigated for shrimp fishery and large-mesh bottom trawl vessels if exemption is approved
Section 3.3.3.2.2, Alternative 3 - River Herring Protection: Option 2 - trigger based closed areas	Neutral Not likely to affect total removals of herring from the fishery; many of the blocks proposed for seasonal closure under Alternative 3 overlap substantially with the herring fishery, suggesting that directed herring fishing effort may be reduced, at least seasonally, in some of the areas, but the areas are small and closed for short durations; other fishing activity is likely to occur as well; no benefits to the resource are expected	Potentially Positive May provide river herring protection during at-sea migrations, reducing mortality; fixed protection areas would not provide river herring protection outside of the areas; open areas could therefore have increased river herring encounter rates, depending on year-to-year variability associated with river herring distribution; triggered closures may not be implemented quickly enough to protect river herring during migration	Unknown Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Decreases in revenue in the directed fishery and/or increases in costs of fishing may occur with the closures; trawl fishery participants during the winter season may experience hardship due to the overlap with Protection Areas; economic and social costs may be incurred though the variability of the hotspots, complexity of reporting catch under triggers, and uncertainty associated with reaching the triggers during the fishing year

Measure Description	Potential Impacts of the Management Measures to Address Midwater Trawl Access to Groundfish Closed Areas (Section 3.4)			
	VEC 1: Atlantic Herring	**VEC 2: Non-Target Species /Other Fisheries**	**VECs 3 and 4: Essential Fish Habitat and Protected Resources**	**VEC 5: Fishery Related Businesses and Communities**
Section 3.4.1, Alternatives 1, 2: No Action/ Pre-CAI Provisions	Neutral/Low Negative Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral/Low Negative Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral Maintain current provisions or adopt pre-CAI provisions; Alt 2 less restrictive by eliminating CAI sampling provisions	Neutral/Potentially Positive No impact (status quo); Alt 2 increases flexibility and fishing opportunities while decreasing the regulatory burden associated with fishing in CAI
Section 3.4.2, Alternative 3: 100% observer coverage in closed areas	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Low Positive May improve accounting and precision of estimates of discards and/or landed bycatch for non-target species, especially groundfish (i.e. haddock, cod); almost all groundfish catch by herring vessels is haddock, which is already managed under a catch cap	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Impacts depend on funding options for observer coverage; would only create negative impacts on herring-related businesses or communities if Federal funds were not used to pay for the additional observer coverage
Section 3.4.3, Alternative 4: Apply CAI provisions Option 4A - 100% observer coverage Option 4B - Less than 100% observer coverage	Low Positive No direct biological impact on the herring resource; indirect long-term benefits likely to result from improvements to catch sampling, increased sampling, and a reduction in unobserved catch	Low Positive Likely to improve accounting of non-target species/other fisheries; may improve estimation of principle bycatch species (herring, haddock, river herring, etc.)	Neutral/Low Positive Observer coverage levels are not likely to affect EFH; information gathering for Protected Resources may benefit from increased coverage	Potentially Low Negative Minimal direct economic impacts on the herring fishery; however there may be new challenges associated with bringing operational discards on board for some vessels; unknown how measure may affect purse seine operations; diminishing flexibility may result since the vessel operator would be required to provide notice if fishing in any of the closed areas
Section 3.4.4, Alternative 5: Closed Areas - prohibit midwater trawl fishing in year-round closed areas	Neutral/Low Positive Not likely to affect total removals because of shifts in fishing effort; may be beneficial for herring in Georges Bank closures (CAI and CAII) and in the more inshore closures in the Nantucket Lightship Closure, GOM Closure, and Cashes Ledge Closures; may offer protection for biodiversity rich areas	Positive May offer protection against groundfish mortality extended beyond existing gear exclusions; may be beneficial for haddock in GB closures (CAI and CAII) and a diverse suite of species (such as river herring, shad, and mackerel) in the more inshore closures in the Nantucket Lightship Closure, GOM Closure, and Cashes Ledge Closures; may offer protection for biodiversity rich areas	Neutral/ Potentially Low Positive Closed areas levels are not likely to affect EFH; Protected Resources impacts are unknown due to uncertainty in shift of effort	Negative Would likely reduce revenues for the midwater trawl fishery; number of midwater trawl trips would likely also decrease; midwater fleet is likely to fish in other, less productive areas while purse seine fleet benefits from their exclusion

The impacts of the Council's **Preferred Alternative are summarized in the shaded text.*

6.6.8 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 tables above are provided as a summary of likely cumulative effects found in the management alternatives contained in Amendment 5. Impacts are listed as no impact/neutral, positive, negative, or mixed. 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 resultant cumulative effect is the CEA baseline that, as described above in Table 199, represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. 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

As noted in Table 199, the combined impacts of past federal fishery management actions has helped the stock retain a not overfished status with overfishing not occurring. Future management efforts are also expected to yield a sustainable herring stock in the future. The actions proposed in this Amendment are expected to continue the trend, by increasing monitoring and improving reporting requirements for the fishery, thereby increasing the quality and quantity of information collected on the stock. The past and present impacts, combined with the Proposed Action and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield low positive impact to the Atlantic herring resource in the long term.

Non-Target Species and Other Fisheries

As noted in Table 199, the combined impacts of past federal fishery management actions have decreased fishing effort and improved habitat protection for non-target species, with the exception of river herring bycatch. Current management measures are expected to continue to control effort, and decrease bycatch and discards. The actions proposed by Amendment 5 are expected to continue this trend by increasing bycatch reporting and monitoring and it is also expected to increase either the protection or monitoring of river herring that is a bycatch of the herring fishery. The past and present impacts, combined with the Proposed Action and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield positive impacts to non-target species.

Physical Environment and EFH

As noted in Table 199, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore have been positive for habitat protection. In addition, better control of non-fishing activities has also been positive for habitat protection. However, both fishing and non-fishing activities continue to decrease habitat quality. No aspects of the Proposed Action are expected to have substantial impacts to habitat or EFH. Overall, the combination of past, present, and future actions is expected to reduce fishing effort and hence reduce damage to habitat; however, it is likely that fishing and non-fishing activities will continue to degrade habitat quality.

Protected Resources

As noted in Table 199, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore reduced interactions with protected resources. Current management measures are expected to continue to control effort and catch, and therefore continue to lessen interactions with protected resources. The actions proposed by Framework 46 are expected to continue this trend; however, as stocks rebuild to sustainable levels, future actions may lead to increased effort, which may increase potential interactions with protected species. Overall, the combination of past, present, and future actions is expected to stabilize protected species interactions and lead to positive impacts to protected species.

Fishery-Related Businesses and Communities

As noted in Table 199, the combined impacts of past federal fishery management actions have reduced effort, and therefore have curtailed fishing opportunities. Past and current management measures, including Amendment 4, will maintain effort and catch limit controls, which together with non-fishing impacts such as rising fuel costs have had significant negative short term economic impacts on human communities. The adjustments to the FMP may provide some benefit to fishing communities by improving catch reporting and notification requirements, but it may also simultaneously decrease vessels ability to sell herring as bait. Depending on the mechanism for funding that is decided upon, the catch monitoring at sea alternatives have the potential to create an immediate high negative effect on communities and businesses by requiring them to pay for the monitoring costs; operational costs may also increase with a few of the measures, and trip termination could also have a high negative impact. Similarly, the river herring bycatch measures would have an immediately negative impact if vessels were required to pay for the monitoring costs; the impacts of having to leave or be denied access to closed areas would also immediately impact vessels and the communities which depend on them. The impacts of the management measures to address midwater trawl access to groundfish closed areas range from potentially positive to negative, depending on the measure chosen; pre-Closed Area I provisions would reduce the regulatory burden on vessels, but prohibiting the midwater trawl fishery from groundfish closed areas could immediately effect vessels negatively. In the short term, this action has the potential to decrease revenue that will compound the significant economic impact on the fishing industry from past actions. Overall, the combination of past, present, and future actions is expected to enable a sustainable harvest of herring, however, which should lead to a long term positive impact on fishery-related businesses and communities.

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

7.1 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 the 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 management measures proposed in Amendment 5 were developed by the Council to achieve the goals and objectives of the Atlantic herring fishery management program, the primary goal of which is to manage the herring fishery at long-term sustainable levels, consistent with the National Standards of the MSA. The first objective of the Herring FMP is to prevent overfishing. Consistent with the MSA requirements for ACLs and AMs , the Atlantic herring fishery is managed through an overall ACL (reduced from the overfishing limit and acceptable biological catch to address scientific uncertainty and management uncertainty) and sub-ACLs that are designed to prevent overfishing on individual stock components. The herring management program also ensures that if catch levels are exceeded, that measures are taken to both offset the catch overage and prevent future overages. The most recent scientific information available (SAW 54, Section 5.1.4.7) indicates that the Atlantic herring resource is not overfished, and overfishing is not occurring. None of the measures proposed in this amendment are expected to affect this determination.

Amendment 5 was developed primarily to enhance catch monitoring for the Atlantic herring fishery. As discussed throughout the analysis in this document, improving catch monitoring may lead to better data for stock assessments, reduce management uncertainty, and increase confidence that the fishery can achieve OY and ACLs can be reached without being exceeded. The measures proposed in Amendment 5 should therefore advance the goals and objectives of the Herring FMP and improve the Council's ability to manage the resource at long-term sustainable levels consistent with National Standard 1.

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

The data sources considered and evaluated during the development of Amendment 5 include, but are not limited to: landings data from vessel trip reports, landings data from interactive voice response reports and vessel monitoring system reports, information from resource trawl and hydroacoustic surveys, sea sampling (observer) data, 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.

A thorough understanding of the strengths and weaknesses of the existing catch monitoring program was a fundamental first step towards designing a new and better program in this amendment. This was the focus of the Herring Committee, Herring Advisory Panel, and Council's discussions during and since the initiation of Amendment 5. The existing catch monitoring program is described in detail and evaluated to the extent possible as part of the description and discussion of the no action alternative in this document.

Biological information from stock assessments is used to evaluate stock condition. In early 2012, the 54th stock assessment workshop (SAW 54) completed an Atlantic herring benchmark stock assessment. 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 development of the Final EIS for Amendment 5 and were evaluated with respect to the proposed management measures.

The economic analyses 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 8.5 for more discussion related to the IQA).

(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. While most Atlantic herring are landed in Maine, Massachusetts, and Rhode Island, Atlantic herring landings have been reported in every state from Maine through Virginia. Most Atlantic herring are caught in the Exclusive Economic Zone (EEZ). In order to address the portion of the resource that is harvested in State waters, the FMP as well as Amendment 5 were developed in close coordination with the Atlantic States Marine Fisheries Commission. The Atlantic herring fishery specifications process requires close coordination with the ASMFC. The development of Amendment 5 was also closely coordinated with the Mid-Atlantic Council, due to the overlap and interaction between the Atlantic herring and mackerel fisheries. The Mid-Atlantic Council developed Amendment 14 to the Squid, Mackerel, and Butterfish FMP (similar goals/objectives as Amendment 5) concurrently with Amendment 5 to ensure coordination and streamline management of the interrelated stocks of fish and overlapping fisheries.

(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.

Fishing-related businesses and communities that participate in/depend on the Atlantic herring fishery are described in detail in Section 5.5 of this document. The management measures proposed in Amendment 5 do not discriminate between residents of different States. This action does not allocate or assign fishing privileges among various fishermen.

The measures in Amendment 5 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, even if the measures are designed to treat all permit holders the same, 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. 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 6.0 of this document; differential impacts are identified and evaluated to the extent possible in the analyses.

(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 action proposed in this amendment should promote efficiency in the utilization of fishery resources by implementing a program intended to improve catch monitoring, address river herring bycatch, minimize bycatch and bycatch mortality to the extent practicable, and ensure compliance with all provisions of the MSA and other applicable law. While economic impacts and the distribution of costs across affected participants in the fishery were important factors that the Council considered during the selection of final management measures for Amendment 5, none of the measures were selected based on economic allocation and/or with economic allocation as the sole purpose.

Efficiency is a very important consideration when it comes to utilizing fishery resources in a sustainable manner. Improving catch monitoring in particular should enhance long-term management of the herring resource, which ultimately should promote efficiency in the utilization of herring by the fishery. If catch statistics improve by implementing the proposed action, then management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty). Ultimately, improving catch reporting could lead to better catch data for stock assessments and may also reduce scientific uncertainty. This will lead to more effective long-term management, which should allow the fishery to achieve OY in the most efficient manner on a continuing basis.

(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 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.

These uncertainties make it difficult to predict exactly how the herring fishery will continue to develop and how it will respond to the measures proposed in this amendment. In order to provide the greatest flexibility possible for future management decisions, the Atlantic Herring FMP includes a framework adjustment mechanism with an extensive list of possible framework adjustment measures that can be used to quickly adjust the plan as conditions in the fishery change. This amendment builds on that process by adding items to the list of measures that can be implemented through a framework adjustment to the Herring FMP and authorizing some of these measures to be implemented through the fishery specification process as well, whichever is most expeditious. See Section 3.5 of this document for more information.

(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 this amendment when developing this action. Any costs incurred as a result of the measures proposed in this amendment 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 amendment are not duplicative and were developed in close coordination with NMFS, the Mid-Atlantic Fishery Management Council, the Atlantic States Marine Fisheries Commission (ASMFC), and other interested entities and agencies to minimize duplicity.

The measures proposed in Amendment 5 are intended to minimize costs and avoid unnecessary duplication, to the extent possible, by implementing a comprehensive catch monitoring program to achieve specific goals, the first of which is to create a cost-effective and administratively feasible program for the provision of accurate and timely records of catch of all species caught in the herring fishery (see Section 2.0 of this document for a thorough discussion of the goals/objectives of the herring management program and this amendment). To achieve this goal, an objective was set forth in Amendment 5 to review Federal notification and reporting requirements for the herring fishery to clarify, streamline, and simplify protocols. This occurred during the development of Amendment 5 through a cooperative effort by NMFS, the Council, and the industry. NMFS distributed detailed information clarifying reporting requirements and implemented changes to streamline herring catch reporting and enhance catch monitoring through rulemaking in the fall of 2011, addressing some of the issues identified in Amendment 5 in a more expeditious manner. The measures proposed in this amendment are intended to further streamline catch reporting provisions; issues/provisions addressed by NMFS during rulemaking in 2011 were eliminated from Amendment 5 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 5.5.3 of this document. Overall, the proposed action is not expected to jeopardize the sustained participation of fishing communities that have depended on the Atlantic herring resource. The Council carefully considered the importance of the herring resource to affected fishery-related businesses and communities when developing the management measures proposed in Amendment 5. The long-term impacts of improving catch monitoring is positive for fishery-related businesses and communities. As reporting and compliance improves, management uncertainty may be reduced (uncertainty about catch estimates is a component of management uncertainty), and long-term management of the herring fishery may improve. To the extent that scientific and management uncertainty can be reduced, additional yield can be made available to the herring fishery. The long-term impacts of reducing scientific and management uncertainty are likely to be positive.

During final decision-making, the long-term positive impacts of improving catch monitoring were weighed against the negative impacts of implementing the catch monitoring program (and other measures proposed in Amendment 5) on fishery-related businesses and communities. Some of the measures proposed in Amendment 5 are likely to impose a cost on the industry, and the impacts on fishery-related businesses and communities are therefore likely to be negative. The measure that is most likely to result in negative impacts on fishery-related businesses and communities is the proposed requirement for 100% observer coverage on Category A and B herring vessels, when combined with a requirement for industry funds to be utilized to support some or all of the coverage. To minimize the potential adverse economic impacts of this measure on herring-related fishing communities, the Council proposes to develop the details of the industry-funded element of the monitoring program during Year 1 under Amendment 5, targeting a maximum industry contribution of $325 per sea day. This approach will allow for a transition from Federal funding to a shared funding approach, while providing an opportunity to develop the details of the program cooperatively with NMFS, the NEFSC, the industry, and third-party service providers. The intent is to identify and reduce costs wherever possible. The Council also proposes to review the high coverage rates proposed in Amendment 5 two years after they become effective, recognizing that the significant costs of 100% observer coverage necessitate a formal review of observer data gathered since Amendment 5 and evaluation/reconsideration of the coverage rates that may be necessary to achieve the goals and objectives of the management program. This approach takes into account the importance of herring to affected fishing communities and attempts to provide for the sustained participation of these communities while minimizing, to the extent practicable, the adverse economic impacts of the measures proposed in Amendment 5.

(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 are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidental catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. Due to the high-volume nature of the Atlantic herring fishery, certain species, including river herring, shad, and some groundfish, may be either discarded or retained and/or sold when harvested during the Atlantic herring fishery. Therefore, for the purpose of this document, the terms "bycatch" and "incidental catch" are sometimes used interchangeably, and measures to "minimize bycatch to the extent practicable" refers to catch of species that may be both bycatch and incidental catch.

The data provided in this document indicate that the majority of catch by herring vessels on directed trips is Atlantic herring, with extremely low percentages of bycatch (discards). However, as noted, some non-targeted catch that is landed incidentally is not separated and identified as such; this is particularly true with species like river herring and shad, other alosine pelagic fish that look very similar to Atlantic herring. The Council recognizes the need to minimize all catch of river herring in the Atlantic herring fishery, bycatch and incidental, and the management measures proposed in this document are intended to do so. Addressing river herring bycatch in the herring fishery includes both minimizing bycatch at-sea to the extent practicable, consistent with the MSA definition of bycatch, and minimizing the landing of river herring as incidental catch in the herring fishery. Measures to address catch monitoring at-sea (Section 3.2) are focused on minimizing bycatch to the extent practicable by increasing observer coverage and addressing net slippage. Measures to address river herring bycatch (Section 3.3) focus on both at-sea bycatch reduction (through monitoring and avoidance) and minimization of river herring incidental catch through portside sampling (as part of the SMAST/SFC program) and measures to adjust the herring fishery management program (Section 3.1).

The Council identified one overall goal and four objectives for Amendment 5 (Section 2.0), three of which are:

- To implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;
- To implement other management measures as necessary to ensure compliance with the MSA; and
- To implement management measures to address bycatch in the Atlantic herring fishery.

Clearly, one of the primary focuses of this amendment is bycatch – bycatch monitoring, accounting, and avoiding and minimizing bycatch and bycatch mortality to the extent practicable, consistent with the MSA and National Standard 9. As noted above, also reducing incidental catch in the herring fishery is part of this focus. During the development of Amendment 5, the Council considered a wide range of alternatives to better document all catch and minimize bycatch/bycatch mortality. Stakeholders and industry members submitted proposals and suggestions for measures to improve catch monitoring and address bycatch, which the Council considered and ultimately developed into the range of alternatives presented in the Draft EIS. The action proposed in this amendment includes a suite of measures that the Council deemed most practicable at this time to minimize bycatch and bycatch mortality. Non-preferred alternatives are analyzed in this document (Section 6.0), and other alternatives considered but rejected are discussed in Section 4.0 of this document.

Catch monitoring is comprehensive in nature and relates to improving the collection of information regarding at-sea (including bycatch/discards and slippage/unsampled catch) and shoreside catch (landings of herring and other species), as well as improving vessel/dealer reporting and real-time quota (ACL/sub-ACL) monitoring. Shoreside monitoring in the form of portside sampling was considered to focus on accurate and real-time accounting of landings and incidental catch – all fish are is brought to port and offloaded from the vessel, either to a processing plant, a bait truck/dealer, other fish dealers, or to be disposed of as bycatch. The Council considered several alternatives to establish a portside sampling program in Amendment 5 (see Section 4.3) and ultimately determined that the primary focus for this action should be at-sea monitoring, coupled with numerous measures designed to improve reporting and enhance ACL-monitoring. Because of the costs and complexities, establishing a Federal portside sampling program, combined with the necessary at-sea component of the catch monitoring program in this amendment, would not be practicable at this time. Portside sampling is still widely supported by the Council, however, as expressed through the measures proposed to address river herring bycatch (including support for the SFC/SMAST/MA DMF river herring bycatch avoidance program, which includes a significant portside sampling element). The Council will continue to support these efforts and may reconsider a portside sampling program for the herring fishery in a future action.

The development of this amendment was a lengthy and comprehensive public process that focused on identifying problems with catch reporting and bycatch accounting and developing feasible solutions that can meet the overall goals and objectives of the management program. The management action proposed in Amendment 5 includes several measures to minimize bycatch and to ensure that mortality does not increase to a point that it would threaten the rebuilding of other stocks (with particular focus on haddock/groundfish and river herring). The amount and quality of the information collected can help managers and the industry to better assess conditions that may lead to higher levels of bycatch, thereby improving the ability of fishermen to avoid it. To achieve the goals/objectives of this amendment, and to ensure consistency with National Standard 9, 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 and continue to minimize the occurrence of bycatch (at-sea and landed) in the herring fishery. Amendment 5 has provided this opportunity, and the proposed measures specifically address monitoring, sampling, reporting, minimizing, and avoiding bycatch to the extent practicable. Many of the proposed adjustments to the fishery management program (Section 3.1) resulted from reviewing the existing monitoring/data collection program for the fishery and identifying areas in need of improvement. The proposed adjustments, in part, streamline the reporting process, which should improve reporting compliance, help ensure accuracy and completeness of data, and improve consistency between databases. Reducing the likelihood for errors in reporting, and consequently, in the calculation of catch statistics will enhance catch monitoring and ensure better compliance with this National Standard as well as all other requirements of the MSA.

Improving the collection of bycatch information through increased sampling is another focus of this amendment, and this directly relates to achieving the objective of minimizing bycatch to the extent practicable. Towards this end, the ***Preferred Alternative*** for catch monitoring at-sea proposes 100% observer coverage on Category A and B herring vessels. The Council believes that the provisions for observer coverage proposed in Amendment 5 can enhance catch monitoring and achieve many of the goals and objectives of this amendment. Support for 100% observer coverage on Category A and B herring vessels was largely supported by a majority of stakeholders who commented on the Amendment 5 DEIS and alternatives under consideration (see summary of comments and responses in Section 8.1.4 of this document and complete public comments in Appendix IX and X, Volume II). Many stakeholders, as well as some members of the herring industry, feel that 100% observer coverage is necessary for the most active vessels to either confirm or disprove the claims that have been made by many regarding bycatch in the herring fishery. The Council agrees that increasing observer coverage in the fishery for the upcoming

is the most practicable approach to determine the true nature and extent of bycatch in the fishery, and to better address and manage bycatch issues in the future.

Additional at-sea monitoring measures proposed in Amendment 5 focus on improving accounting and sampling of both total catch and bycatch, i.e., everything that enters the net and is either pumped aboard the fishing vessel or discarded at sea. During the development of Amendment 5, the Council identified several components of sampling the herring fishery at-sea that are critical to generating accurate information about bycatch and minimize bycatch/bycatch mortality to the extent practicable, two of which are sampling operational discards and slipped catch. The Council chose to address both of these components in Amendment 5.

1. Measures to Improve/Maximize Sampling At-Sea (Section 3.2.2) include requirements for vessel operators to provide observers with visual access to the net/codend after pumping has ended, before the pump is removed (and a similar requirement for bottom trawl vessels to bring the codend and any of its remaining contents on board). This addresses the need to better sample operational discards, small amounts of fish that cannot be pumped and that remain in the net at the end of pumping operations in a manner that still allows vessels to operate safely. To the extent that the proposed measure can improve the observers' access to all of the fish in the net, the observers' ability to identify species composition of operational discards and other discarded fish may improve. This may improve estimates of bycatch/discards of non-targeted species in the herring fishery and ultimately lead to a more reliable discard estimate that can be utilized for better managing bycatch in the fishery.
2. Measures to Address Net Slippage (Section 3.2.3) are intended to improve documentation and minimize the occurrence of full/partial slippage events by herring vessels. Slippage is defined in Amendment 5 as unobserved catch, i.e., catch that is discarded prior to being observed, sorted, sampled, and/or brought on board the fishing vessel. Slippage can include the release of fish from a codend or seine prior to completion of pumping or the release of an entire catch or bag while the catch is still in the water. The ability to document slippage events and determine the quantity and species composition of slipped catch has been a significant concern of the Council and many interested stakeholders during the development of Amendment 5. The ***Preferred Alternative*** addresses this concern by implementing provisions to better document slippage events and discourage the occurrence of slippage throughout the fishery, while continuing to promote safe and efficient fishing practices. The sampling provisions implemented in Closed Area I appear to have been successful in reducing slippage events to date, so the Council developed the ***Preferred Alternative*** based on the CA I provisions, with some modifications to allow for the measures to be applied throughout the fishery, on vessels using gear other than midwater trawl gear. Support for trip termination measures relates to accountability, as well as implementing a deterrent to discourage inappropriate use of the slippage exceptions (safety and mechanical failure). The success of the CA I sampling program, to date, is one of the primary reasons that the Council believes this approach to be the most practicable approach for addressing slippage concerns and further assuring consistency with this National Standard.

Amendment 5 includes specific management measures to address river herring bycatch (see Section 3.3). The proposed action establishes River Herring Monitoring/Avoidance Areas (where 100% observer coverage will be required by Category A/B vessels without any allowance for waivers) and adopts an approach to support the herring industry's current efforts for river herring bycatch monitoring and avoidance. As discussed throughout this document and noted above, 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, some river herring may be sold in combination with Atlantic herring as bait, and some discarding might take place in processing plants rather than at sea. Portside sampling through some State programs (ME, MA, for example) is providing a significant amount of information regarding landed river

herring "bycatch"; the measures in Amendment 5 focus more on documenting, sampling, and avoiding river herring bycatch at-sea.

The specific goal that the Council adopted in Amendment 5 to address river herring bycatch is river herring monitoring and avoidance. Inherent in this goal is minimizing river herring bycatch to the extent practicable. The management alternatives considered by the Council in Amendment 5 to address river herring bycatch were based on the river herring hotspot analysis developed by the Herring PDT (see details in Appendix IV, V, and VI). The intent of the structure of the alternatives was to better link the configuration of the river herring areas to the goals of the management program. The ***Preferred Alternative*** provides a mechanism for the Council to formally work in cooperation with the fishing industry to develop and support real-time bycatch avoidance in this fishery through increased monitoring and communication networking. This approach has proven successful for yellowtail flounder bycatch avoidance in the scallop fishery, and the Council intends to support a similar approach for the herring fishery. The Council chose this alternative because it builds off both the proposed requirements for observer coverage (Section 3.2.1.2) and the need to work in cooperation with the fishing industry to most effectively reduce bycatch across the fishery. Information reviewed during the development of Amendment 5 suggests that little is known about the nature, extent, and impact of river herring bycatch in the herring fishery on the river herring resource. Moreover, the impacts of area closures considered in Amendment 5 are not possible to predict at this time; perhaps even more uncertain is the potential for bycatch to increase outside small areas proposed for seasonal closure. In turn, the Council determined that the most practicable measures to implement in Amendment 5 to address river herring bycatch would be those that increase catch monitoring and bycatch accounting, and promote cooperative efforts with the industry.

Amendment 5 also includes a mechanism to establish a river herring catch cap for the herring fishery in the future, through a more expeditious process like framework adjustment (see Section 3.3.5). Ultimately, depending on the outcome of the SMAST/SFC program, the Council may advance the goal of river herring monitoring and avoidance by linking the approach proposed in Amendment 5 with a river herring catch cap and providing the industry with the incentive to develop their own approaches to minimizing bycatch and staying under the cap. Though Amendment 1 authorized the implementation of measures to address bycatch (including catch caps) through the framework adjustment process, the information and analyses presented in Amendment 5 more specifically address concerns related to river herring and include information to form the basis for implementing a catch cap and the necessary reporting and monitoring provisions to ensure its effectiveness. The measure has been more thoroughly evaluated in Amendment 5, allowing more timely and efficient implementation in the future through the framework adjustment process. The Council is aware of the pending ESA determinations for river herring and the potential effects that the determination could have on the herring industry, which is why the Council is also proposing Alternative 2, Option 4 (Two Phase bycatch avoidance approach based on SFC/SMAST/DMF project) to address river herring bycatch in this amendment. The two measures (river herring bycatch avoidance program and catch cap) ultimately may be most effective in combination with each other, and Amendment 5 lays the groundwork for developing this approach. As a data improves, so will the ability to perform analyses to inform management decisions and support effective, long-term management that minimizes bycatch to the extent practicable. In fact, at the time of this final drafting (March 2013), the Council has already initiated the development of Framework 3 to the Herring FMP, which will consider alternatives to establish river herring catch caps in the herring fishery. It is anticipated that this framework adjustment will be completed by the end of this year (2013).

Amendment 5 also proposes to eliminate midwater trawl vessels from year-round groundfish closed areas in an effort to minimize groundfish bycatch and further promote groundfish stock rebuilding. Section 5.2 of this document provides information to characterize the nature and extent of groundfish bycatch in the herring fishery. Although groundfish bycatch is not considered to be significant in the herring fishery, the Council believes that efforts to further minimize the occurrence of groundfish bycatch are necessary at this time, given the recent (overfished) status of some important groundfish stocks. The ***Preferred Alternative*** (Section 3.4.3) proposes to apply the Closed Area I sampling provisions with 100% observer coverage to all midwater trawl vessels fishing in the year-round closed areas and is consistent with the suite of measures proposed in this amendment to achieve the goals and objectives related to bycatch minimization. This alternative would provide a greater source of information regarding the nature and extent of bycatch. This measure also addresses perceived inequities expressed by many stakeholders during the DEIS comment period regarding the allowance of gear that is capable of catching groundfish into the groundfish closed areas. The proposed provisions for access to the year-round groundfish closed areas still allow the herring midwater trawl fishery to operate in the groundfish closed areas but ensure that monitoring and sampling are maximized based on measures that already have proven to be effective in Closed Area I. The success of the CA I sampling program, to date, is one of the primary reasons that the Council believes this approach to be the most practicable approach for addressing slippage concerns and further assuring consistency with this National Standard.

(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 Council is aware of the safety implications of its management decisions, both through extensive public comment and the practical experience of many of its members. Safety was evaluated relative to all of the alternatives considered in Amendment 5 during the Council/Committee/PDT discussions, and throughout the discussion of impacts on fishery-related businesses and communities. The management measures implemented through Amendment 5 were evaluated twice by the Council's Enforcement Committee, and safety was a significant focus of discussion related to management measures, particularly those that address catch monitoring at-sea (Section 3.2).

Amendment 5 promotes the safety of human life at sea through the measures to improve/maximize sea sampling (Section 3.2.2), which are focused on ensuring safe sampling and cooperative working conditions for fishery observers. These measures should improve the vessel owner/operator's understanding regarding expectations and the collection of information by observers during a fishing trip, and ensure safe working conditions for observers on all fishing vessels. In addition, the management measures proposed to address net slippage (Section 3.2.3) specifically authorize allowances for slippage events in instances when vessel safety is a concern (as well as instances when gear is damaged).

Consistent with the Enforcement Committee's recommendations, decisions regarding safety must always be left to the vessel captain. To ensure that safety is not compromised, the proposed measure includes ten-event thresholds per management area and gear type before trip termination measures apply. This allows for up to ten slippage events per year/management area/gear type for safety concerns and/or gear damage. Information presented in Section 6.3.2.1 suggests that this allowance should address safety concerns particularly in the offshore fishery, while still discouraging net slippage and improving the monitoring/documenting of slipped catch.

7.2 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;

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. None of the measures proposed in this amendment apply to foreign fishing vessels.

(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;

All of the information required by this provision can be found in this integrated Amendment 5 FEIS document. This document updates herring stock and fishery information through the 2010 fishing year and through 2011 when available. The measures proposed in this amendment 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 5.5). 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 amendment, 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 this 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;

Amendment 5 to the Atlantic Herring FMP proposes to improve catch monitoring and implement other measures to minimize bycatch and address the fishery management program, consistent with the MSA. 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 54). This information will form the basis of the upcoming Atlantic herring fishery specifications package, where OY is specified for the upcoming fishing years, and projections related to the overfishing limit (OFL), acceptable biological catch (ABC) and an overall ACL for herring (representing OY) are evaluated. Information related to SAW 54 and the updated Atlantic herring biological reference points is summarized in Section 5.1.4.7 of this document. Issues related to this required provision of the MSA will be further addressed during the Atlantic herring fishery specifications process.

(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;

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). Issues related to this provision of the MSA will be further addressed during the Atlantic herring fishery specifications process.

(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;

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 and provided in the Affected Environment (description of Fishery-Related Businesses, Section 5.5.1) of this document.

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 fishermen during the 2006 fishing year. This ensured that the fixed gear measures proposed in this amendment can be adequately monitored and enforced.

(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 this amendment 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 Amendment 5 (for more information, see discussion of National Standard 9 in previous section).

(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 amendment updates the description of the physical environment and EFH in Section 0 and evaluates the impacts of the proposed management action and other alternatives considered on EFH throughout Section 6.0. Overall, there are no additional impacts to the physical environment or EFH expected from the action proposed in this amendment.

Potential shifts in adverse effects are discussed for each of the alternatives proposed in this amendment. These assessments are qualitative, as changes in the direction and magnitude of fishing effort in response to management actions can be difficult to predict. The conclusions reached regarding the habitat impacts of individual management measures being considered in this action should be viewed in the context of the overall impacts that the herring fishery has on seabed habitats described in this document. Previous analyses have concluded that adverse effect to EFH that result from operation of the herring fishery do not exceed the more than minimal or more than temporary thresholds. In summary, it can be concluded that the herring fishery continues to have no more than minimal and temporary adverse effects on EFH. This is based on the previous finding that the fishery, as it existed in 2005, was not having more than a minimal or temporary impact on EFH and that there have not been any significant changes in this fishery since then that have caused this determination to change.

(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;

Data and research needs relative to Atlantic herring and its associated fisheries are described in Section 9.0 of this document. 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.

The Council also identified important research needs specific to the issues that are addressed in this amendment; these research needs are described in Section 9.1 of this document. During the development of the Amendment 5 alternatives, the Council considered several management approaches and different "tools" to utilize when developing a comprehensive catch monitoring program for the herring fishery. While some of those tools may not yet be fully tested and ready to implement across the herring fishery, there appears to be potential in the near future to utilize them to improve catch monitoring. The Council identified two research priorities for further enhancing catch monitoring in the future: (1) electronic monitoring (EM) applications for net sensors; and (2) EM through the use of video cameras on the vessels. The Council supports and encourages testing and development of these technologies in cooperation with the herring industry.

(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;

This amendment document includes analyses and discussion of the impacts of the proposed management action and all other alternatives considered by the Council on the affected human environment, including herring fishery participants and communities. The fishery impact statement for this amendment is contained throughout the analyses provided in Section 6.0 of this document (impacts on fishery-related businesses and communities).

Herring is managed by the New England Council in cooperation with the Atlantic States Marine Fisheries Commission. The Atlantic mackerel fishery is managed by the Mid-Atlantic Fishery Management Council. The overlap between the Atlantic herring and mackerel fisheries was an important consideration during the development of Amendment 5, 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. In recognition of the overlap between these fisheries, the Council developed the measures proposed in this amendment 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. Concurrently during the development of Amendment 5, the Mid-Atlantic Council developed Amendment 14 to the Squid, Mackerel, and Butterfish FMP to implement measures similar to those proposed in Amendment 5 for the Atlantic mackerel fishery.

Safety is always an important consideration and was a focus of discussion during the development of management measures to address at-sea monitoring in Amendment 5. The Council consulted twice with its Enforcement Committee during the development of Amendment 5 and received input regarding the management measures ultimately proposed in this document.

(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.

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 BMSY reference point (157,000 mt). Estimated fishing mortality in 2011 was 0.14, which is below FMSY (0.27). More information can be found in Section 5.1.4.7 of this document.

(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.

One of the primary goals of this amendment is to implement a comprehensive catch monitoring program for the herring fishery and address bycatch to the extent practicable. Additional discussion is provided relative to National Standard 9 in the previous section of this document.

(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;

The action proposed in this amendment 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;

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 5.5) and updates information provided in Amendments 1 and 4 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 fishing year 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 are addressed in this amendment, 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. For more information, see Section 5.1.4.7 of this document.

The overall harvest from the Atlantic herring fishery, including ABC, OY, DAH, DAP, ACLs, will continue to be reviewed, established, and analyzed through the fishery specification process, which includes buffers/reductions from an overfishing limit to account for scientific and management uncertainty. Action related to the specification process will 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 (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.

8.0 RELATIONSHIP TO OTHER APPLICABLE LAW

8.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

8.1.1 Introduction/FEIS Table of Contents

NEPA requires preparation of an Environmental Impact Statement (EIS) for major Federal actions that significantly affect the quality of the environment. The Council published a Notice of Intent (NOI) to prepare this Amendment in the *Federal Register* May 8, 2008. A second, Supplementary NOI was published on December 28, 2009 to announce the intent to prepare an EA for Amendment 4 and EIS for Amendment 5, after the two amendments were split. The purpose of both of the NOIs was to alert the interested public to the commencement of the scoping process and to provide for public participation in the development of this amendment, consistent with the requirements of NEPA. The Council prepared a scoping document that outlined some of the major issues and types of management measures that the Council might consider during the development of Amendment 5. The Council invited discussion on the scoping document and any other issues of concern at the scoping meetings as well as suggestions for appropriate management measures to consider during the development of this amendment. A summary of the scoping process and the comments received can be found in Section 1.3 of this document.

To prepare the Draft Amendment/DEIS, the Council also held many meetings of its Herring Oversight Committee, and Herring Advisory Panel. All of these meetings, as well as numerous Herring Plan Development Team meetings, were open to the public. A list of public meetings held during the development of Amendment 5 is provided in Section 10.0 of this document (p. 628). The proposed management action and other alternatives considered by the Council, described and analyzed in this integrated amendment/FEIS document, were the subject of public hearings during March/April 2012 (as a Draft Amendment/DEIS). The Council took public comment into consideration when selecting the final management measures for Amendment 5 later during 2012. Final selection of management alternatives for inclusion in Amendment 5 occurred at the June 2012 Council meeting. A summary of the public comments received and the Council's response is provided in Section 8.1.4 of this document. All of the public comments received on the Draft Amendment 5 document and the DEIS from both the MSA hearings and the NEPA comment period are provided in Appendix IX and X of this FEIS document (Volume II).

The following **Table of Contents for the Amendment 5 FEIS** is provided to aid reviewers in referencing the appropriate corresponding sections of this integrated document.

FEIS SECTION	AMENDMENT SECTION	PAGE
Cover Sheet	FEIS	i
Executive Summary	Executive Summary	Executive Summary
Background and Purpose		
Purpose and Need for Action	1.4	12
Goals and Objectives	2.0	13
Scoping Process	1.3	6
Areas of Controversy and Issues to be Resolved	8.1.3	599
Summary of Comments and Responses	8.1.4	601
Proposed Management Action and Other Alternatives Considered	3.0	16
Management Measures Considered but Rejected	4.0	103
Description of the Affected Environment	5.0	118
Atlantic Herring	5.1	118
Other Fisheries	5.2	152
Physical Environment and EFH	0	205
Protected Resources	5.4	227
Fishing Businesses and Communities	5.5	240
Environmental Impacts	6.0	359
Cumulative Effects	6.6	548
List of Preparers	11.0	631
Determination of Significance	8.9.2.5	625
FEIS Circulation List	8.1.4	601
List of Public Meetings	10.0	628
Index	13.0	638

8.1.2 Summary of Amendment 5 Scoping Process

A summary of the Amendment 5 scoping process is presented in Section 1.3 of this document.

8.1.3 Areas of Controversy and Issues to be Resolved

Amendment 5 was developed under close scrutiny, and there were mixed public reactions to the measures proposed in the Draft EIS and management action proposed in this document, especially on the topics of catch monitoring at-sea and river herring bycatch. Over 47,000 comments were received during the comment period that offered various concerns with the amendment measures (see following section). The comments are provided in Appendix IX and X of this document (Volume II) and are summarized in the comments and responses in the following subsection. The major areas of controversy relate to funding for observer coverage in the limited access directed herring fishery and developing appropriate measures to address river herring bycatch, given the current status of river herring and the recent petition to consider listing under the ESA.

Requirements for observer coverage in the fishery were a primary area of controversy, as indicated by both the scoping comments (Section 1.3) and the response to the DEIS comments (Section 8.1.4 below). Many stakeholders, as well as some members of the herring industry, feel that 100% observer coverage is necessary for the most active vessels to either confirm or disprove the claims that have been made by many regarding bycatch in the herring fishery. The Council agrees with the need to increase observer coverage in the fishery to determine the true nature and extent of bycatch in the fishery, and to better address and manage bycatch issues in the future. The has addressed these comments in this amendment by proposing a requirement for 100% observer coverage on Category A/B vessels with a review of coverage levels two years after implementation. Moreover, the Council recommends an industry-funded component of the monitoring program to be implemented within one year following implementation of Amendment 5, with a target maximum industry contribution of $325 per sea day.

Funding for observer days remains an issue to be resolved. To mitigate some of the negative economic impacts associated with high levels of observer coverage, the Council will target a per-sea-day industry contribution of $325 when developing the industry-funded portion of this program. The Council proposes to develop the details of this element of the program during the first year after Amendment 5 implementation. This approach allows NMFS to work with the Council, the herring industry, and service providers to develop the most efficient and effective approach for cost-sharing. Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be further developed by the NEFOP, in order to provide consistency across data collection. A complete description of the proposed measures to allocate observer coverage is provided in Section 3.2.1 of this document.

It is possible that program costs can be lowered with adequate planning and design time. However, a successful industry-funded monitoring program will probably take a significant amount of time to develop and incorporate into the current management system. Careful attention must be paid to designing the program properly to ensure data quality, reduce trouble-shooting with industry and service providers, increase efficiency, and reduce costs. While this should not delay the selection of final management measures and the completion of Amendments 5, the Council recognizes that this element of the program may require more time for implementation than others and is allowing one year for careful design and implementation. The Council will continue to resolve this issue as it moves forward developing the industry-funded component of the monitoring program under the provisions of Amendment 5.

Concerns about the status of the river herring resource and the impacts of river herring bycatch in the directed herring fishery were another major area of controversy during the development of Amendment 5. During the scoping period for Amendment 5, there was concern from several interested parties that bycatch of river herring by the Atlantic herring fleet was high. Some suggested that higher monitoring would allow for better estimates of the amount of river herring being caught. Others felt that more restrictive measures should be taken in the herring fishery. Some also requested that the Council consider spatial restrictions such as "safe zones", in which the Atlantic herring fleet would not be able to operate. Although many issues were mentioned with regard to degraded habitat in coastal areas and inland, most were in reference to how those issues are being addressed. The greatest concern for the decline in river herring populations was believed by many to be occurring during the ocean stage of the river herring's life.

The Council considered these concerns very seriously during the development of Amendment 5 and coordinated efforts with the ASMFC and the Mid-Atlantic Council to address the conservation needs of river herring in Federal waters. The Council has laid a framework in Amendment 5 to collect more and better information about river herring bycatch in the fishery and work with the industry to minimize bycatch to the extent practicable. This is an issue that the Council will continue to resolve in the future. The Council is aware of the pending ESA determinations for river herring and the potential effects that the determination could have on the herring industry, which is why the Council is also proposing Alternative 2, Option 4 (Two Phase bycatch avoidance approach based on SFC/SMAST/DMF project) to address river herring bycatch in this amendment. As a data improves, so will the ability to perform analyses to inform management decisions and support effective, long-term management that minimizes bycatch to the extent practicable.

The goal that the Council adopted for Amendment 5 is ***river herring monitoring and avoidance*** (See Section 3.3.2.2). The Council intends to further minimize river herring bycatch and bycatch mortality through the establishment of a river herring catch cap in the future. The management alternatives considered by the Council in Amendment 5 to address river herring bycatch were based on the river herring hotspot analysis developed by the Herring PDT (see details in Appendix IV, V, and VI in Volume II of this document). The intent of the structure of the Amendment 5 alternatives was to better link the configuration of the river herring areas to the goals of the management program. Ultimately, depending on the outcome of the SMAST/SFC program, the Council may advance the goal of river herring monitoring and avoidance by linking the approach proposed in Amendment 5 with a river herring catch cap and providing the industry with the incentive to develop their own approaches to minimizing bycatch and staying under the cap.

Though Amendment 1 authorized the implementation of measures to address bycatch (including catch caps) through the framework adjustment process, the information and analyses presented in Amendment 5 more specifically address concerns related to river herring and include information to form the basis for implementing a catch cap and the necessary reporting and monitoring provisions to ensure its effectiveness. The measure has been more thoroughly evaluated in Amendment 5, allowing more timely and efficient implementation in the future through the framework adjustment process. The Herring PDT provided a detailed discussion paper addressing the development of river herring catch caps, including a discussion of the potential challenges associated with implementing and monitoring, as well as the potential impacts of catch caps. The Herring PDT's discussion paper can be found in Volume II of this amendment (Appendix VII) and forms the basis for future development of river herring catch caps through a framework adjustment, or through the herring specifications process.

The Council believes that a river herring catch cap would provide a strong incentive for the industry to avoid river herring and help to minimize its overall catch. A river herring catch cap, in combination with the ***Preferred Alternative*** for river herring bycatch monitoring/avoidance (Alternative 2, Option 4, see previous discussion in Section 3.3.2.2.4), would form the basis for a long-term approach to managing river herring bycatch similar to that used for managing yellowtail flounder bycatch in the scallop fishery. The Council supports this approach as the most effective, least costly manner to allow the industry to manage its own bycatch.

8.1.4 DEIS Comments and Responses

8.1.4.1 Overview

At its June 19-21, 2012 meeting, the Council reviewed all public comments and selected final management measures to be submitted in Amendment 5. To select final management measures for Amendment 5,a review of public comments must be considered, which can be received either through public hearings or written form. Opportunities for public comment are required under both the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the National Environmental Policy Act (NEPA). Written comments on the draft amendment were accepted by the Council through mail, email, and/or facsimile from late February – April 19, 2012 and by NMFS from April 20, 2012 – June 4, 2012 (NEPA comment period); these comments are summarized below and are provided in ***Appendix IX***, Volume II of this document. In addition, the Council held eight public hearings during March 2012 to solicit comments on Draft Amendment 5 to meet the requirements of the MSA and one additional public hearing in April 2012 during the 45-day NEPA comment period. A full transcription of the public hearings is provided in ***Appendix X***, Volume II of this document. During the comment period, the full Amendment 5 DEIS and public hearing document were available on the Council website and copies were made available by request.

The total number of written letters and emails received during the comment period for Amendment 5 is 47,868; some are signed by multiple individuals due to being batched emails and signed "form letters." Many of these comments received were from stakeholders, industry groups, environmental organizations, and individuals (groundfish, tuna, bluefin, herring, lobstermen, and recreational fishermen, as well as other stakeholders). A list of the many groups providing comments includes (please see comment letters in Appendix IX for more information about the individual organizations and entities): PEW, Honest Bycatch, CHOIR, ABTA, Earthjustice, MCSBA, NRDC, SBCBA, Buckeye Brook Coalition, Oceana, Blue Ocean Society, Whale Watch Industries, MA Commercial Striped Bass Association, Stripers Forever, Innovative Stone, Cape Cod Conservation District, NAMA, Nantucket Angler's Club, MA Lobstermen's Association, Maine Lobstermen's Association, Town of Wellfleet, Lund's Fisheries, Recreational Fishing Alliance, RI bottom trawl fleet, NETC, Conservation Law Foundation, Watershed Action Alliance of SE Mass, Western Sea Fishing Company, Cape Seafoods Inc., New England Coastal Wildlife Alliance, Jones River Watershed, Alewife Harvesters of Maine, Coastal Conservation Association of NH, Town of Nantucket, MA, Dukes County Fishermen's Association, Cape Cod Commercial Hook Fishermen's Association, ME Association of Charterboat Captains, Save the Bay, ME Coast Fishermen's Association, Commercial Anglers Association, Great Egg Harbor Watershed Association & River Council, CT Charter and Party Boat Association, CIIFA, New England Aquarium, Bourne Consulting Engineering, Cape Cod Commercial Hook Fishermen's Association, National Coalition for Marine Conservation, ASMFC, Little Bay Lobster LLC, SF Offshore Inc., Island Institute, Penobscot East Resource Center, MSBA, MCFA and NORPEL.

There were a number of management actions discussed by many of those who submitted comments, but five issues provide a common theme throughout many of the written comments and those provided at public hearings:

1. 100% Observer Coverage on Category A/B Herring Vessels (little/no support for similar requirements on C/D vessels)
2. Implement Measures to Address Net Slippage – Closed Area I provisions and trip termination (10 slippage events vs. 5 slippage events)
3. Require Herring Dealers to Accurately Weigh All Fish
4. Prohibit Midwater Trawl (MWT) Vessel Access to Groundfish Closed Areas
5. Establish a River Herring Catch Cap immediately (not unanimously supported by those who expressed support for the other four issues identified above)

The letters and public hearing summaries should be referenced to gain a better perspective on individual comments (see Appendix IX and X in Volume II). ***MSA comment period*** and ***NEPA comment period***, indicated below, will identify the specific comments that were received during those comment periods. If the comment is not identified as such, then the same comment was expressed during both comment periods.

8.1.4.2 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels

Comment: **Industry, fishermen and environmental groups support 100% Observer Coverage on Category A/B Herring Vessels** (little/no support for similar requirements on C/D vessels) because they catch upwards of 97% to 98% of the total Atlantic herring catch. Many herring fishermen feel that this is the only way to prove that their fishery is a clean fishery. Some feel as though there should be a "sunset clause" of two years for 100% observer coverage and also feel that it should be an industry/government funded program ($320 -$325/day according to the west coast program) to be more cost effective amongst the herring fleet because there is a high risk possibility that 100% coverage could put small vessels out of business. Some comments suggested splitting the measures in Amendment 5 into those that address Category A/B vessels and those that address Category C/D vessels.

Response: The Council agrees that the Category A and B vessels represent the vast majority of the herring fishery (supported by information in Section 5.5 of this document) and has addressed these comments in this amendment by proposing a requirement for 100% observer coverage on Category A/B vessels with a review of coverage levels two years after implementation. Moreover, the Council recommends an industry-funded component of the monitoring program to be implemented within one year following implementation of Amendment 5, with a target maximum industry contribution of $325 per sea day. Funding Option 1 (Federal funds only) is proposed to be implemented for one year until funding Option 2 can be fully implemented. A complete description of the proposed measures to allocate observer coverage is provided in Section 3.2.1 of this document. Category C vessels are part of the limited access herring fishery, and while catch from C vessels represents a small component of total herring catch, the Council supports the inclusion of Category C vessels in other management measures proposed to address catch monitoring in Amendment 5 (ex., trip notification requirements, measures to maximize sampling, measures to address net slippage) to improve consistency and enhance the overall monitoring program.

Comment: **Several fishermen and other individuals expressed concern about the potential loss of fishing vessels due to the costs associated with 100% observer coverage.** It was suggested that this management action could create controversial funding issues amongst federal government and industry. Some individuals feel this could end the small herring boat fishery if industry has to pay for observers, which the small vessels would not be able to fund and/or compete with the larger vessels over the long-term.

Response: The Council has addressed these comments in this amendment by proposing an industry-funded program to be developed in cooperation with the industry and implemented one year following the implementation of Amendment 5 (see response above). Because of concerns associated with high levels of coverage and the costs of NMFS-approved observers, the Council is targeting a $325 contribution per sea day from the industry, although the details of the program still remain to be developed. The costs to the industry and economic impacts of the monitoring program will be evaluated further when the details of the program are fleshed out further. Due to concerns associated with impacts to smaller vessels and those less dependent on the herring fishery, the proposed requirements for observer coverage and industry funding are limited to Category A and B herring vessels, and there will be a review of the observer coverage levels after two years of implementation. Category A and B vessels generally represent the larger vessels in the fishery (see Section 5.5.1.3.1 for information about these vessels).

Comment: **(*NEPA comment period*) There were concerns expressed from fishermen regarding the safety of observers, particularly on small vessels.** These commenters generally supported 100% observer coverage, however, small vessels have limited deck space and due to safety concerns, observer may be limited in terms of their ability to perform their duties while fishing is occurring.

Response: The safety of the crew and observers is a top priority to consider when making management decisions. National Standard 10 of the MSA states that, "Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea." The qualifying phrase "to the extent practicable" recognizes that regulation necessarily puts constraints on fishing that would not otherwise exist. These constraints may create pressures on fishermen to fish under conditions that they would otherwise avoid. National Standard 10 instructs the Councils to identify and avoid those situations, if they can do so consistent with the legal and practical requirements of conservation and management of the resource. The management measures and/or provisions discussed and implemented through Amendment 5 were evaluated twice by the Council's Enforcement Committee, and safety was a significant focus of discussion related to management measures, particularly those that address catch monitoring at-sea (Section 3.2). Amendment 5 promotes the safety of human life at sea through the measures to improve/maximize sea sampling (Section 3.2.2), which are focused on ensuring safe sampling and cooperative working conditions for fishery observers. Consistent with the Enforcement Committee's recommendations, decisions regarding safety must always be left to the vessel captain.

Comment: **Many comments suggested there to be two or three observers monitoring a vessel at any one time.** Some fishermen (groundfish, tuna), industry, and environmental groups feel that two, three, or even four observers on a boat at one time are needed to handle the necessary and required actions of an observer for a 24-hour herring fishing operation. Some commented that observers should note the spawning condition of the fish when they are offshore as well as acknowledge if the fishery is clean in their documentation. Many felt that this is the only way that adequate and sufficient data would be recorded.

Response: The Council supports 100% observer coverage on Category A and B herring vessels in Amendment 5, but recognizes that there are funding concerns as well as safety concerns regarding two or more observers on a vessel at any one time (smaller vessels are not able to take more than one extra person due to vessel size). The measures proposed in Amendment 5 are intended to maximize observer coverage on the majority of herring vessels, while minimizing the economic burden on the industry, to the extent possible. The NEFOP observer program has developed a standardized program which involves procedures and protocols that maximize observer sampling while promoting safe work practices and the health and well-being of the observer and crew (such provisions are at the directive of the NEFOP program). Moreover, the measures to improve/maximize sea sampling would require an observer on every vessel in multi-vessel operations, which would enhance coverage to ensure all catch is observed when there are more than one or two vessels involved (Section 3.2.2). In addition, provisions for carrier vessels are also intended to improve observer sampling with intent of more flexibility (Section 3.1.3.2). Lastly, funds are limited at the present time and the priority is to ensure 100% coverage for Category A and B vessels. At that time it is likely that funding will be re-evaluated.

Comment: **(*MSA comment period*) Fishing Gear Loss amongst lobstermen.** Many lobstermen commented that there can be significant gear conflict between lobster pots and the midwater trawl gear and would like to see 100% observer coverage.

Response: The Council supports 100% observer coverage on Category A and B herring vessels in Amendment 5, which represent the majority of the directed herring fishery and the vast majority of the herring midwater trawl fleet. Any gear/fishery interactions should be better documented through the measures proposed in this amendment.

Comment: **Some herring fishermen feel that there should only be 100% observer coverage on those vessels that have documented significant bycatch events (based on the most recent observer data), while others feel that coverage should be set by gear type and not permit category; some comments expressed support for 100% coverage in Areas 1A and 1B only, and some expressed support for 100% coverage in groundfish Closed Areas only.** Several comments stated that the same results can be achieved without 100% coverage on category C, and D vessels (the concern is regarding C/D category vessels, which are generally smaller vessels that represent 1% - 3% of the herring catch). There is an array of opinions regarding what is considered "100% coverage" among the herring industry and other stakeholders; all have a significant concern about funding issues associated with 100% observer coverage. Many stakeholders noted that recent observer coverage has been around 30% and expressed concern about the unobserved 70%; however, the herring industry commented that there has been 75% or more coverage offshore because of the Closed Area I provisions, and that there has been a very low bycatch rate in the herring fishery in recent years.

Response: The Council has determined that 100% observer coverage on Category A and B herring vessels for at least two years after the implementation of Amendment 5 will provide the information necessary to determine the nature and extent of bycatch in the Atlantic herring fishery, identify sampling issues, and evaluate coverage needs for future years. The Council acknowledges concerns regarding Category C/D vessels. Based on the information/analyses provided in this document as well as extensive public comment, the Council has determined that the observer coverage requirements should be limited to Category A and B vessels at this time. Other measures to maximize sampling at sea and address net slippage apply to Category C vessels. Measures that apply to Category D vessels are identified accordingly in this document.

The Council has also determined that the requirement for 100% observer coverage on Category A/B vessels should be applied across the entire fishery, at least for the first two years following implementation. This means that 100% coverage will be required by all gear types with Category A and B permits, including trips fishing in the groundfish closed areas (and subject to any other provisions for those areas, including those proposed in Section 3.4.3 of this document). This is the most comprehensive and expeditious manner in which to collect observer data for the fishery in order to identify bycatch issues.

Comment: **Some fishermen and industry members support 100% observer coverage but only if the funding is 100% covered by the Federal government.** These individuals feel that the provision/measure is necessary in an effort to prove that the herring fishery is clean, but if the fishermen and/or the industry must pay for it then small boats will go out of business followed by the large vessels, due to lack of profit. The herring fish is mostly used as a bait fish and is not as profitable as many other species; thus, effort will go down as a result of 100% observer coverage funded by the industry.

Response: The Council has determined that 100% observer coverage on Category A and B herring vessels for at least two years after the implementation of Amendment 5 will provide the information necessary to determine the nature and extent of bycatch in the Atlantic herring fishery, identify sampling issues, and to evaluate coverage needs for future years. One year after Amendment 5 is implemented, the funding provisions intended to minimize costs to industry (to the extent practicable) are likely to be in effect (Section 3.2.1.2). Within that year is the intended timeframe in which industry and Federal government will work cooperatively to develop a program that minimizes costs and maximizes efficiency with target maximum contribution rate of $325 per sea day, a rate which is estimated to minimize monetary burden on industry. It is intended that this measure is reviewed after two years to determine if the 100% observer coverage-levels are still necessary.

8.1.4.3 Management Measures to Improve Sampling and Measures to Address Net Slippage

Comment: **Some commenters expressed concern about the provisions to improve/maximize sampling because they saw potential loopholes in the proposed provisions**. Environmental groups commented on that *Sub-Options 2D* (Requirements for Trips with Multiple Vessels) and *2F* (Visual Access to the Net/Codend) are of particular concern, and some stakeholders expressed opposition to these measures. The commenters believe that there should always be an observer required on all vessels taking on fish in a multi-vessel operation, and the phrasing in *Sub-Option 2D* contains an unacceptable loophole (the inclusion of the phrase "wherever/whenever" possible). Opposition to *Sub-Option 2F* related to the vague nature of the requirement.

Response: The Council is proposing management measures in Amendment 5 to address net slippage and ensure that sampling by observers in the herring fishery improve through safe, effective, and efficient means. By minimizing slippage events and better documenting slipped catch, the measure could improve bycatch estimates as well as be cost effective and administratively feasible while in support of the herring industry (Section 3.2.3). *Sub-Option 2D* states that, 'When observers are deployed on herring trips involving more than one vessel, observers would be required on any vessel taking on fish wherever/whenever possible.' The qualifying language recognizes potential funding limitations and acknowledges the role of the NEFOP in determining when it may be practical, possible, and/or safe to

deploy observers on all vessels in a multi-vessel operation. This issue is discussed more in the rationale provided for this measure in Section 3.2.3.4 of this document.

Sub-Option 2F states that, "Vessel operators would be required to provide and assist NMFS-approved observers in obtaining visual access to the codend (or purse seine bunt) and any of its contents after pumping has ended, before the pump is removed." The intent of this language is to improve the observer's ability to sample the entire contents of the bag, including operational discards, while recognizing the diversity of fishing operations and potential logistical/safety issues that may be associated with a requirement for all vessels to bring the net on board. In general, on trawl vessels, the codend and any remaining contents should be brought on board after pumping. If this is not possible, the vessel operator would be required to work with the observer to ensure that the observer can see the codend and its contents as clearly as possible. This issue is discussed more in the rationale provided for this measure in Section 3.2.3.4 of this document.

Comment: **Implement Measures to Address Net Slippage – Closed Area I (CAI) provisions and trip termination (10 slippage events vs. 5 slippage events).** There was widespread support by many stakeholders for the inclusion of management measures to address net slippage in Amendment 5; the majority of stakeholder comments expressed support for Option 4 in some form. There were many comments in support of the proposed threshold of ten (10) slippage events over five (5) events.

Response: Based on the comments received and the significant concern expressed about net slippage throughout the development of this amendment, the Council supports the inclusion of full sampling provisions (based on the Closed Area I rules, ***Preferred Alternative*** as drafted in Section 3.2.3.4) with a trip termination threshold of ten events by gear type and management area. The Council intends for this measure to improve documenting and accounting of slippage events in the fishery and discourage this practice to the extent possible, without compromising vessel safety or the safety of human life at sea.

The Council supports a threshold of ten slippage events at this time, but separated the thresholds by gear types and management areas due to concerns that the thresholds may be more prohibitive than intended. The Council believes that action is necessary to minimize slippage events to the extent possible, recognizing safety as the key concern. The intent is to discourage slippage events from happening while collecting data efficiently, not to impose measures that may be perceived as punitive or unfair. This measure should help make the industry more aware of this issue and discourage wasteful and inefficient fishing practices without significantly impacting the herring industry. Available slippage data and a discussion of impacts on fishery-related businesses and communities can be found in Section 6.3.2.1 of this document.

Comment: **There were a number of comments that opposed all measures proposed in Amendment 5 to address net slippage.** The majority of the herring industry acknowledged the importance of minimizing slippage and promoting clean and efficient fishing practices but opposed the measures proposed in Amendment 5 because they appear somewhat arbitrary and punitive. It was expressed that herring is a clean fishery in comparison with other fisheries and that may be dangerous to bring the pump or codend over the rail of a midwater trawl vessel during some fishing activities, and it may not be possible at all for other vessels. It was also noted that the observers and captains of the vessel do not have an issue with a visual inspection of the codend while alongside the vessel.

Response: The Council is aware and understands the herring industry's concerns regarding the measures to address net slippage. The measure's intent is to encourage responsible fishing practices without significantly impacting the herring industry or compromising vessel safety. Information presented in Section 6.3.2.1 suggests that a threshold of ten slippage events should not only address safety concerns particularly in the offshore fishery, but still discourage net slippage and improve the monitoring/documenting of slipped catch. The information presented in this section also suggests that purse seine vessels will be more impacted than midwater trawl vessels by the measures proposed to address net slippage.

Comment: **Many environmental groups and other stakeholders feel that there may be a loophole in the proposed measures to address net slippage regarding operational discards.** They feel that net slippage should apply to operational discards, not just full/partial slippage events as described in Amendment 5.

Response: Slippage is clearly defined in Amendment 5 as unobserved catch, i.e., catch that is discarded prior to being observed, sorted, sampled, and/or brought on board the fishing vessel. *Slippage* can include the release of fish from a codend or seine prior to completion of pumping or the release of an entire catch or bag while the catch is still in the water. This definition was developed by the Herring PDT working in close coordination with the NEFOP staff. Fish that cannot be pumped and that remain in the net at the end of pumping operations are considered to be operational discards and not slipped catch. Observer protocols include documenting fish that remain in the net in a discard log before they are released, and existing regulations require vessel operators to assist the observer in this process.

The Council chose to address the need to better sample both operational discards and net slippage through separate management measures in Amendment 5.

- Measures to Improve/Maximize Sampling At-Sea (Section 3.2.2) include requirements for vessel operators to provide observers with visual access to the net/codend after pumping has ended, before the pump is removed (and a similar requirement for bottom trawl vessels to bring the codend and any of its remaining contents on board). This addresses the need to better sample operational discards, small amounts of fish that cannot be pumped and that remain in the net at the end of pumping operations. To the extent that the proposed measure can improve the observers' access to all of the fish in the net, the observers' ability to identify species composition of operational discards and other discarded fish may improve. This may improve estimates of bycatch/discards of non-targeted species in the herring fishery and ultimately lead to a more reliable discard estimate that can be utilized for better managing bycatch in the fishery.
- The Council supports the inclusion of full sampling provisions (based on the Closed Area I rules, ***Preferred Alternative*** as drafted in Section 3.2.3.4) with a trip termination threshold of ten events by gear type and management area, which will also address the bycatch estimate with the intent to discourage the practice of net slippage (*Option 4C*). The ability to document slippage events and determine the quantity and species composition of slipped catch has been a significant concern of the Council and many interested stakeholders during the development of Amendment 5 (reference NS9).

Moreover, the proposed requirement for 100% observer coverage on Category A and B herring vessels will further ensure the effectiveness of the measures proposed to address/improve the sampling of both operational discards and net slippage.

Comment: ***(MSA comment period)*** **It was suggested that an additional question be added to observer program protocols to document whether or not fish are on board the vessel prior to the start of a fishing trip.** It was stated that this may be a common scenario amongst the fleet for a number of reasons (ex. not enough trucks show up to pump the fish off the vessel). Some felt that this may help improve catch estimates from observer data and reduce discrepancies between data sets.

Response: This issue was raised during the final selection of measures for Amendment 5 at the June 2012 Council meeting but was not addressed in the DEIS for Amendment 5. The Council Chairman ruled the motion regarding this issue "out of order." The Council may address this issue through a future action if the need arises.

8.1.4.4 Reporting Requirements for Federally-Permitted Herring Dealers

Comment: **The vast majority of those individuals and organizations who commented, including the herring industry, expressed support for measures to require that dealers accurately weigh all fish.** Many feel that there are too many methods being utilized throughout the Northeast and that there should be a standardized method or approach to weighing herring without significantly affecting the fishery.

Response: The Council agrees with these comments and is proposing that federally-permitted herring dealers accurately weigh all fish, which is described in Option 2 (2B) and also states that dealers need to document how composition of mixed catch is estimated for every landings submission. During the development of Amendment 5 Council evaluated numerous methods for weighing fish, including using flow scales and hopper scales, truck scales, and volumetric measurements. These methods of weight are detailed further in Appendix I of this document (Volume II): Discussion Paper: *Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery.* It was determined, due to the diversity of fishing operations and the many different methods for processing/utilizing herring that the industry work with NMFS to develop appropriate weighing methods to ensure compliance and accuracy and minimize costs. The Council also determined that the volumetric methods that have been applied in this fishery for years appear to be relatively consistent and accurate, which are generally described in the discussion of impacts of this measure on fishery-related business and communities (Section 6.1.4).

While it is recognized that dealers already weigh fish and it is required that federally-permitted dealers are required to report the weight of fish they purchase in pounds (for all fisheries/transactions), the Council believes that establishing this specific requirement by regulation will improve catch monitoring in the herring fishery due to diversity within the fishery and the numerous methods for offloading/weighing/selling Atlantic herring. These various methods have been reviewed by the Council and are described in detail in Appendix I of this document (Volume II). Improving documentation of the methods by which dealers weigh all catch and requiring vessels to confirm the amount of fish landed will result in better overall estimates of catch and help ensure that catch limits are not exceeded. Accurate landings data will also aid in monitoring any catch caps that may be established in the future, and in achieving better catch and bycatch estimates of small-bodied fish that are often landed with herring, such as river herring and shad.

Comment: **Many stakeholders who commented on this issue felt that there should be a more consistent method to weigh herring catch and/or that the methods used currently are not reliable.** Many suggested that using a standard volumetric weighing method would be sufficient and less burdensome for the industry; it was noted that European countries use a method to measure their vessels tanks volumetrically at 98% accuracy. Environmental groups suggested that Option 2 be implemented in combination with all sub-options under consideration.

Response: The Council is proposing Option 2 with Sub-Option 2B as the ***Preferred Alternative*** in Amendment 5. This measure would require federally permitted Atlantic herring dealers to accurately weigh all fish as well as document how composition of mixed catch is estimated for every landings submission. If dealers do not sort by species, they would be required to document (for individual landing submissions) how they estimate the relative composition of a mixed catch, to facilitate quota monitoring and cross-checking with other data sources.

The two other options considered were Sub-Option 2A and Sub-Option 2C. Sub-Option 2A would 'Require dealer to annually document how composition of mixed catch is estimated' and Sub-Option 2B would 'Require dealer to obtain vessel representative confirmation of SAFIS transaction record at first point of sale.' Sub-Option 2A will not provide sufficient data for quota monitoring because it is qualitative as is Sub-Option 2B, however Sub-Option 2B is less burdensome on the herring industry; Sub-Option 2C was indicated as an increase in administrative and reporting burden for the herring industry.

In reference to the above comment the various methods have been reviewed by the Council and are described in detail in Appendix I of this document (Volume II): Discussion Paper: *Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery*. At this time, the Council is not specifically requiring the use of scales to weigh all fish, although the proposed measure certainly supports this approach. The requirement is left more general at this time so that all acceptable forms of weighing fishing can be utilized to minimize the costs associated with this requirement. The potential administrative costs and burden on the herring industry should be minimized because the priority at this time is to address the need for more observer coverage in the fishery as well as the costs that will be associated with an industry-funded monitoring program.

8.1.4.5 Management Measures to Address River Herring Bycatch

Comment: ***(NEPA comment period)*** **Many commenters expressed support for a river herring bycatch avoidance program that is operated in real time via SMAST in cooperation with the fishing industry (Sustainable Fisheries Coalition) and other agencies.** They feel that the SMAST/SFC/MA DMF program will help bring more data and science to management of bycatch in the fishery.

Response: The Council also supports the river herring bycatch avoidance initiative led by the Sustainable Fisheries Coalition (SFC) in cooperation with SMAST and Massachusetts Division of Marine Fisheries. This forms the basis of the ***Preferred Alternative*** for management measures to address river herring bycatch in Amendment 5. SFC members account for the majority of US landings of Atlantic herring and mackerel. River herring species are also encountered in these directed fisheries. Minimizing unintended bycatch has been a goal of SFC members since fisheries managers alerted the industry in 2006 that the river herring species complex was depressed. The SFC/SMAST collaboration seeks to develop (1) a predictive model of where alosines are likely to occur in space and time, (2) a real-time bycatch avoidance intra-fleet communication system, and (3) additional support for port sampling to inform the initiative.

The goal that the Council adopted for Amendment 5 is ***river herring monitoring and avoidance*** (See Section 3.3.2.2). The Council intends to further minimize river herring bycatch and bycatch mortality through the establishment of a river herring catch cap in the future. The management alternatives considered by the Council in Amendment 5 to address river herring bycatch were based on the river herring hotspot analysis developed by the Herring PDT (see details in Appendix IV, V, and VI). The intent of the structure of the alternatives was to better link the configuration of the river herring areas to the goals of the management program. Ultimately, depending on the outcome of the SMAST/SFC program, the Council may advance the goal of river herring monitoring and avoidance by linking the approach proposed in Amendment 5 with a river herring catch cap and providing the industry with the incentive to develop their own approaches to minimizing bycatch and staying under the cap.

Comment: **Many commenters supported the implementation of an immediate catch cap for river herring and other management measures to address river herring and shad conservation.** Some suggested that this measure was already authorized in Amendment 1 to the Atlantic Herring FMP. Some comments expressed support for "hotspots," which are referred to as "Monitoring/Avoidance Areas" in Amendment 5, with a 3 to 10 mile barrier along the coastline and would close down the fishery once the "hotspots" reached a specific threshold (provide allowance for future expansion).

There are many environmental groups that feel there should be river herring closures to protect and improve the river herring stock as well as address river herring in federal waters because of the pending ESA listing on the species. Industry and fishermen suggested daily reporting on river herring bycatch. Many commented that it should be addressed with cooperation through the industry and an outside academic-partner.

Response: The management measures under consideration in Amendment 5 to address river herring bycatch relate to the overall goal of Amendment 5: to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These measures also directly address the first three objectives of Amendment 5: (1) to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery; (2) to implement other management measures as necessary to ensure compliance with the MSA; and (3) to implement management measures to address bycatch in the Atlantic herring fishery. Amendment 5 is designed to specifically address National Standard 9 (bycatch) with particular attention to river herring. Information reviewed during the development of Amendment 5 (presented in this document and Volume II) indicates that in order to address river herring bycatch, it is equally as important to collect more and better information as it is to implement measures to encourage bycatch avoidance and minimization at this time.

The Council will consider establishing a river herring catch cap for the Atlantic herring fishery as one of several potential measures to reduce bycatch. The catch cap will be considered by the Council through a framework adjustment to the Herring FMP or the Atlantic herring fishery specifications process after the ASMFC completes its stock assessment (Section 3.3.5). Though Amendment 1 authorized the implementation of measures to address bycatch (including catch caps) through the framework adjustment process, the information and analyses presented in Amendment 5 more specifically address concerns related to river herring and include information to form the basis for implementing a catch cap and the necessary reporting and monitoring provisions to ensure its effectiveness. The measure has been more thoroughly evaluated in Amendment 5, allowing more timely and efficient implementation in the future through the framework adjustment process. The Council is aware of the pending ESA determinations for river herring and the potential effects that the determination could have on the herring industry, which is why the Council is also proposing Alternative 2, Option 4 (Two Phase bycatch avoidance approach based on SFC/SMAST/DMF project) to address river herring bycatch in this amendment. As a data improves,

so will the ability to perform analyses to inform management decisions and support effective, long-term management that minimizes bycatch to the extent practicable.

Comment: **Some environmental groups and fishermen made note of habitat concerns and other issues that are likely related to river herring stock declines.** Some feel that issues such as degradation of habitat of rivers and streams reduce river herring numbers, as well as their sensitivity to light and sound. There were comments raising concern about the adult and juvenile life cycle stages at sea and suggested that the Council should support more research regarding this. A commenter noted that plankton (river herring's primary food source) is declining, causing lower numbers and slower growth in the stock and increasing mortality rate. A real time daily reporting method was suggested for river herring. One comment suggested that the mortality rate of the fish may be double due to its smaller size than in the past.

Response: The Council agrees that the importance of habitat is essential to the river herring's livelihood. The Council as well as industry and the public are aware and interested in what influences the river herring resource such as river pollution, water run-off, dams, as expressed above their sensitivity to noise and light, predators, decreased food resource (plankton), as well as the outcome of fishing mortality on the species. The river herring resource is a collective and complicated problem not solely due to bycatch issues. As a result, the Council supports continued research regarding river herring and any other important factors that may be involved to make the resource sustainable and flexible for the herring industry.

Additionally, the impacts of the measures to address river herring bycatch on essential fish habitat (EFH) are expected to enhance monitoring requirements; enhanced monitoring requirements are not expected to result in any additional impacts to seabed habitats/EFH, and while predetermined seasonal closures could influence spatial patterns of fishing effort, the changes are difficult to predict. Furthermore, river herring is currently being looked at as an ESA listing, which considers the importance of habitat influences. It will become even more important in the future to work cooperatively with towns, states, and other Federal agencies to develop a comprehensive approach to rebuilding river herring stocks throughout the range.

8.1.4.6 Measures to Address Midwater Trawl Access to Groundfish Closed Areas

Comment: **There was widespread support for prohibiting midwater trawling in the year-round groundfish closed areas (Alternative 5).** Many fishermen expressed support for this measure because they believe that the gear does fish the bottom. Tuna fishermen also noted that they believe the midwater trawl fleet can create a noise disturbance causing the bluefin tuna to move out of an area. Many commenters wondered why midwater trawling has been prohibited in other fisheries/areas but not the groundfish closed areas. Also, many environmental groups felt that midwater trawl vessels should only be allowed in groundfish areas with an experimental fishing permit (EFP).

Response: The Council acknowledges the comments concerning the impact of the midwater trawl fleet in the groundfish closed areas and supports increased monitoring and sampling of herring midwater trawl vessels in these areas. Although the data analysis presented in Amendment 5 (Section 5.2.2.3 and 6.5) do not indicate groundfish bycatch by herring vessels as a significant problem and/or one that compromises groundfish stock rebuilding, the Council believes that the concerns are significant enough that precautionary measures should be taken to ensure that impacts on groundfish from other fisheries like the midwater trawl fishery continue to be minimized.

Section 5.2.2.3 and 6.5of this document provides information to characterize the nature and extent of groundfish bycatch in the herring fishery. Although groundfish bycatch is not considered to be significant, the Council believes that efforts to further minimize the occurrence of groundfish bycatch are necessary at this time, given the recent (overfished) status of some important groundfish stocks (reference NS9). In response to the public concern during the development of Amendment 5, the Council is taking steps to ensure that midwater trawl trips in the closed areas are fully sampled by proposing 100% observer coverage on midwater trawl vessels with additional sampling provisions like those currently effective in Closed Area I (Section 3.4.3). Closed Area I provisions have proven successful in terms of increasing sampling and discouraging slippage.

Though the concern the environmental groups pose about groundfish closed areas is acknowledged, the scientific data and recommendations provided by the Herring PDT were examined by the Council, and it was determined that Alternative 4 would be more beneficial at this time because it would provide an increased level of data needed for a more accurate assessment of groundfish bycatch issues in the future.

Comment: **Many commenters from the herring fishing industry do not support measures to restrict midwater trawl activity in groundfish closed areas and want the herring fishery to operate at current or possibly increased levels.** The majority of these commenters feel that there is little to no interaction with groundfish in the midwater trawl herring fishery. They feel that the collapse of the groundfish in the GOM is due to predation of pelagic species, which is creating a difficult time for cod and haddock to recover. Others in the herring industry supported criteria to re-establish measures for midwater trawl vessel access to the groundfish closed areas through *Alternative 2*, especially given the healthy status of the herring resource. Concern was expressed if a prohibition from fishing in the groundfish closed areas results in a shift in effort to areas outside, with more groundfish bycatch.

Response: Though groundfish bycatch is not considered to be a significant problem, the Council believes that efforts to further minimize the occurrence of groundfish bycatch are necessary at this time due to the recent (overfished) status of some important groundfish stocks (see response to the comment above). The Council is aware of the possible predation of the pelagic species that is driving the cod and haddock stocks to a severely depressed level, but more data and analysis are needed. It was suggested that Alternative 4 would provide a greater source of information regarding the nature and extent of bycatch (versus Alternative 2). The proposed provisions for access to the year-round groundfish closed areas still allow the herring midwater trawl fishery to operate in the groundfish closed areas but ensure that monitoring and sampling are maximized based on measures that already have proven to be effective in Closed Area I.

8.1.4.7 Proposed Adjustments to Fishery Management Program

Comment: **The herring industry expressed support for many of the proposed adjustments to the fishery management program in Amendment 5.** Comments from the herring industry included support for *Option 2 (Modify and Extend the Pre-Trip Notification Requirements)* and *Option 3 (Extend Pre-landing Notification Requirement)*. Some also expressed support to allow utilization of the VMS system on the carrier vessels for trip declarations to provide flexibility; some are also in favor of the at-sea herring dealer permit.

Response: Under the Trip Notification Requirements provision the Council recommended ***Preferred Alternative – Option 2 and Option 3*** (Section 3.1.4) and agrees with the comments presented above. Many support modifying and extending the pre-trip notification requirements to all limited access herring vessels through the PTNS and VMS declarations (***Preferred Alternative Option 2***) because it would help to ensure timely deployment of observers to the limited access vessels in the fishery and would facilitate enforcement; extending the pre-landing notification requirements to all limited access herring vessels (***Preferred Alternative Option 3***) would facilitate both enforcement and portside sampling of the fishery (State, Federal, or other). These options provide increased flexibility amongst the herring fleet for A/B and C herring vessels.

Extending the VMS pre-landing requirement to all limited access herring vessels encountering herring on a trip would have been a more effective provision if the catch monitoring program developed in this amendment included a dockside monitoring/sampling program. However, extending the VMS pre-landing requirement may still facilitate enforcement and could provide consistency regarding vessels that would be subject to pre-trip and pre-landing notification requirements and may reduce the complexities associated with declarations into/out of the fishery. The notification can still facilitate the deployment of dockside samplers through State programs, to the extent that States can work with NMFS to coordinate sampling throughout the fishery.

Extending the pre-trip and pre-landing notification requirements may improve allocation of observers and help ensure the timely sampling of the Atlantic herring fishery. Thus, data collected via the observer program may be more likely to achieve management goals (e.g., CV targets on discard estimates). Subsequently, management uncertainty may be reduced (uncertainty about discard estimates is a component of management uncertainty) and long-term management of the herring fishery may improve. Ultimately, this could lead to better catch data for stock assessments and may also reduce scientific uncertainty over the long-term.

Comment: **Commenters expressed support for Option 2 for the Limited Access Mackerel Vessels with open access herring permits fishing in Areas 2/3.** The support for this option is regarding the establishment of the new open access herring permit for limited access mackerel fishery participants, in Areas 2/3 only, for those vessels that did not qualify for a limited access herring permit. It was noted that Option 2 includes a proposed possession limit that is most consistent with the allowances in the Mackerel FMP.

Response: The Council agrees and supports Option 2 as the ***Preferred Alternative*** in Amendment 5. This measure creates a form of reciprocity between limited access herring fishery participants and limited access mackerel fishery participants. Since each are likely to catch the other's targeted species as bycatch/incidental catch, the equity issue may be resolved by permitting similar levels of non-directed catch in both fisheries. The restriction to Areas 2/3, the proposed possession limit, and reporting

requirements assure that the ACLs will not be breached by allowing mackerel boats increased possession limits of herring. Mackerel vessels that may qualify and choose to obtain the new open access permit for herring would have the same notification and reporting requirements as those for Category C herring vessels.

8.1.4.8 Other Comments

Comment: **Many commenters, including representatives from the herring industry, suggested reconsideration of a portside/dockside monitoring program for the herring fishery.** Many feel that this is a useful tool for comprehensive sampling of catch in the herring fishery and for stock assessment purposes. They also noted that the cost for this program is much less than at-sea monitoring using a NEFOP observer, while recognizing that observers serve an important role documenting at-sea discards.

Response: The portside/dockside monitoring program was considered by the Council in Amendment 5, but eliminated due to administrative/resource issues identified by NMFS and NEFSC, however it was recognized that the sampling provided by portside/dockside monitors is of great value, especially in combination with observer data. However, there were problems that existed regarding the program such as only monitoring full offloads and not partial offloads because some vessels are not equipped to land in facilities that are amenable to sampling full offloads. Logistical issues were identified, but the most significant problems in Amendment 5 related to administrative costs and the general funding for a comprehensive portside sampling program. However, the Herring PDT strongly supports portside sampling for the herring fishery and provided comprehensive analyses for the Council to evaluate in Amendment 5 (see Appendix II in Volume II of this document). The Council may revisit this issue for reconsideration in a future action.

Comment: ***(MSA comment period)*** **Maximum Sustained Yield vs. Maximum Sustained Value and other related issues.** Some comments suggested that the Council should be considering maximum sustained value instead of maximum sustained yield for herring because herring may be more valuable indirectly to industries like whale watching and ecotourism.

Response: Maximum sustained yield (MSY) is a specification that is mandated by the Magnuson Stevens Act, and the Council is required to manage fisheries based on MSY reference points for each stock. However, it is recognized by the Council that the economic value of fisheries extends well beyond ex-vessel revenues, particularly for a species like herring that is linked to so many other commercial and recreational species (and non-consumptive industries) in this region. Amendment 5 considers non-consumptive industries (ex. whale watching and eco-tourism) and other fisheries that rely on herring. Related information is presented in Section 5.0 of this document, and impacts on these sectors are considered throughout the analyses.

Comment: **Concerns about predator-prey relationships with Atlantic herring.** Some stakeholders noted the importance of predator-prey relationships and expressed concern that there was not adequate discussion in Amendment 5 about this issue, given the fact that it is included as one of the objectives of the amendment.

Response: Atlantic herring is recognized as an important forage species in the Northeast Region ecosystem. While available information to quantify the importance of herring as a forage species is limited, there is a substantial amount of literature that describes the role that herring plays in the ecosystem and estimates the amount of herring consumed by predators. Observational and empirical evidence suggests that there are four major groups of predators on Atlantic herring in the Gulf of Maine-Georges Bank region. Marine mammals, large pelagic fishes, seabirds, and medium demersal fishes consume herring. Extensive analysis was done by the Council on this subject and provided in Amendment 1, further information about the role of herring in the ecosystem, particularly as a forage species and the ongoing research related to these important issues is located in Appendix V (Volume II) in a paper entitled 'The Role of Atlantic Herring, *Clupea Harengus*, in the Northwest Atlantic Ecosystem.' This paper was prepared by Council staff in order to document and summarize available literature regarding this subject and should be referenced for additional information.

Furthermore, of the four objectives mentioned in Amendment 5, the fourth objective refers to herring as a forage fish and states, '…to consider the health of the herring resource and the important role of herring as a forage fish and a predator fish throughout its range.' Predator-prey relationships related to herring are assessed in this amendment to the extent possible, with respect to the potential impacts of the measures proposed in Amendment 5. Moreover, this issue is evaluated thoroughly in the Atlantic herring stock assessment when developing specific biological reference points. The Herring PDT recently noted (August 2012) that natural mortality and consumption have been evaluated more thoroughly for Atlantic herring than assessments for other species in the Northeast region.

Comment: **Some comments expressed concern and/or identified flaws with the analyses provided in the Amendment 5 DEIS.**

Response: This Draft EIS presents a range of alternatives under consideration in Amendment 5, which relate to the goals and objectives outlined in the document. This document also includes a detailed description of the affected environment and valued ecosystem components, and analyses of the impacts of the measures under consideration on the affected environment. It addresses the requirements of the National Environmental Policy Act (NEPA), the MSA, the Regulatory Flexibility Act (RFA), and other applicable laws. Consistent with NEPA, there are five VECs that are described in this amendment, including: Atlantic herring, non-target species and other fisheries, physical environment and essential fish habitat (EFH), protected resources, and fishery-related businesses and communities. The concern regarding the flaws in the analysis is acknowledged, however, the analysis goes through a rigorous process to comply with the MSA and NEPA. The concerns have been addressed in the information and analyses presented in this FEIS document, to the extent possible.

The development of Amendment 5 is very long and extensive and includes numerous documents, materials, information, and analyses, not all of which are contained in the Draft EIS, but were considered by the Council during the development of the alternatives considered and the selection of the proposed management action. The data sources considered and evaluated during the development of Amendment 5 include, but are not limited to: landings data from vessel trip reports, landings data from interactive voice response reports and vessel monitoring system reports, information from resource trawl and hydroacoustic surveys, sea sampling (observer) data, 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. In early 2012, the 54th stock assessment workshop (SAW 54) completed an

Atlantic herring benchmark stock assessment. Conclusions and results were available during development of the Final EIS for Amendment 5 and were evaluated with respect to the proposed management measures.

The economic analyses 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 8.5 for more discussion related to the IQA).

8.1.5 FEIS Circulation List

The final Amendment 5 document and FEIS is available on the NEFMC web page, www.nefmc.org. Copies were provided to all Council members. Announcements of the documents availability will be made in the Federal Register and to the interested parties mailing list. In addition, copies were distributed to the following:

US Environmental Protection Agency
EIS Filing Section
Office of Federal Activities
Ariel Rios Building (South Oval Lobby)
Mail Code 2252-A
1200 Pennsylvania Avenue N.W.
Washington, DC 20460

United States Environmental Protection Agency (USEPA), Region 1
One Congress Street, 11th Floor
Boston, MA 02203
higgins.elizabeth@epa.gov

USEPA, Region 2
290 Broadway, 25th Floor
New York, NY 10007
212.637.3738
musumeci.grace@epa.gov

USEPA, Region 3
1650 Arch Street
Philadelphia, PA 19106
215.814.3367
arguto.william@epa.gov

USEPA, Region 4
61 Forsyth Street
Atlanta, GA 30303
404.562.9611
chris.hoberg@epa.gpv

District Commander
First Coast Guard District
408 Atlantic Avenue
Boston, MA 02210
6178.223.8480

Office of Marine Conservation
Department of State
2201 "C" Street, N.W.
Washington, DC 20520

Acting Executive Director
Marine Mammal Commission
4340 East-West Highway
Bethesda, MD 20814

Office of Environmental Affairs
Department of Interior
1849 "C" Street, N.W.
Washington, DC 20520
202.208.3100

8.2 MARINE MAMMAL PROTECTION ACT (MMPA)

A description of marine mammals potentially affected by the measures proposed in Amendment 5 is provide in Section 5.4 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 marine mammals, see Section 6.0 of this document. The NEFMC has reviewed the impacts of the alternatives under consideration 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.

8.3 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 Amendment 5 is provided in Section 5.4 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 6.0 of this document.

8.4 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.

With significant changes to the catch monitoring program proposed for the Atlantic herring fishery, Amendment 5 contains new collection of information requirements subject to the PRA, including changes to permits, reporting requirements, and notification requirements, among other things. The PRA package prepared in support of this action and the information collection required by the proposed action, including forms and supporting statements, will be submitted when Amendment 5 is submitted.

8.5 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

This document includes: 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.

The information being provided in this amendment concerning the status of the herring fishery is based on information contained in the Draft EIS for Amendment 5 to the Atlantic Herring FMP and other recent documents. The information is updated through the 2010 fishing years throughout the document, and 2011 data are provided if available. Information presented in this document is intended to support the proposed management action, which has 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 Amendment 5 document and FSEIS 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

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

In preparing this amendment document, the Council(s) must comply with the requirements of the Magnuson-Stevens Act, Regulatory Flexibility Act, Administrative Procedures Act, Paperwork Reduction Act, Coastal Zone Management Act, Endangered Species Act, Marine Mammal Protection Act, Data Quality Act, and Executive Orders 12612 (Federalism), 12630 (Property Rights), 12898 (Environmental Justice), 12866 (Regulatory Planning), and 13158 (Marine Protected Areas). The policy choices (i.e., management measures) proposed in this amendment are supported by the best available scientific information. The Council's rationale for the Proposed Actions (described throughout Section 3.0) further addresses the issues. Qualitative discussion is provided in cases where quantitative information was unavailable, utilizing appropriate references as necessary.

This document uses information of known quality from sources acceptable to the relevant scientific and technical communities. 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 interactive voice response reports, information from resource trawl and hydroacoustic surveys, sea sampling (observer) data, 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. 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.

The review process for any action under an FMP involves the New England Fishery Management Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries headquarters. The document was prepared by staff of the Council and Center with expertise in Atlantic herring resource issues, habitat issues, economics, and social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the specifications document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the specifications document and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.6 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. No comments were received from any State officials relative to any federalism implications that may be associated with this action.

8.7 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.

8.8 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 Amendment 5.

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

8.9.1 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.

8.9.1.1 Statement of the Problem/Goals and Objectives

The purpose of the action and need for management is described in Section 1.4 of this document, and goals and objectives of the management program and Amendment 5 are found in Section 2.0.

8.9.1.2 Management Alternatives and Rationale

The proposed management action is identified as the Council's ***Preferred Alternative*** throughout Section 3.0 of this document (Proposed Management Action and Other Alternatives Considered). The Council's rationale for selecting the ***Preferred Alternative*** is provided in Section 3.0 as well. Management measures that the Council considered but rejected during the development of Amendment 5 are discussed in Section 4.0.

8.9.1.3 Description of Small Entities

Information about fishery-related businesses and communities potentially affected by the measures proposed in Amendment 5 is presented in detail in Section 5.5 of this document. 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. A portion of the proposed regulations affect fish (herring) dealers. The small business standard for fish and seafood wholesalers (NAICS 424460) is one hundred employees. Some of the dealers are also processors. The small business standard for Fresh and Frozen Seafood Processing (NAICS 311712) is five hundred employees. Neither small organizations nor small governmental jurisdictions are expected to be affected by measures proposed in Amendment 5.

In the 2011 calendar year, there were 2,240 fishing vessels which held herring permits for at least some period of time. 2,147 of these vessels held Category D (open access vessels), and 93 held limited access Category A,B, and/or C permits. Two vessels which held Category A permits had gross receipts from fishing over $4M in either 2010 or 2011. One additional Category A vessel had revenues over $3.8M in at least one of these years. The 2,147 Category D and 91 Category A/B/C vessels are considered small entities for RFA purposes. Two vessels are considered large entities for RFA purposes. Category D vessels participate incidentally in the fishery and would only be minimally affected by the proposed regulations. Therefore, attention is focused on the 91 small vessels.

Vessels frequently work in temporary, short-term partnerships for paired seine or trawling activities. It is possible that vessels may be considered affiliated under the "Common Management" (13CFR121.103, section 4e) or "Identity of Interest" (section 4f). Vessels with common owners may also be affiliated entities under "Stock Ownership," and "Common Management" clauses. Finally, vessels may also be affiliated with processing plants and the relevant entity for SBA RFA purposes would be the joint vessel-plant company. However, NMFS currently has no data regarding vertical integration or ownership. The entity in the harvesting sector for the purposes of RFA analysis is the individual vessel.

At this time information about employees and all dealers/processors are treated as small entities.

8.9.1.4 Summary of Economic Impacts

The primary goal of RFA analysis is to consider the effect of regulations on small entities, recognizing that regulations frequently do not provide for short-term cash reserves to finance operations through several months or years until the positive effects of the regulation start paying off.

The economic impacts of the proposed regulations and alternatives are described in Sections 6.2.6, 6.3.2.2.6, 6.4.6, and 6.5.6 of this document. The proposed regulations and alternatives are expected to have similar economic impacts on all entities (regardless of SBA designation of small). Note that many small entities (particularly Category D permit holders) will not be impacted by these proposed rules.

The proposed rules which are most likely to impact business profitability are the rules which require additional catch-monitoring at-sea (Section 3.2.1), which address river herring bycatch (Section 3.3) and address access to groundfish closed areas (Section 3.4). The target maximum industry contribution is $325 per sea day, it is not clear what will occur if this target cannot be met.

The alternatives for 100% observer coverage (with a $325 target cost target in Year 2) may reduce profitability of all entities, including small entities (see Table 160 and Table 161). The magnitude of this effect depends on the final costs of sea days and cannot be determined at this time. However, the minimum and likely maximum costs can be described and placed into the context of current daily operating costs and daily gross revenues.

Relative to the daily operating costs for the fishery, the cost of an observer for limited access herring vessels is fairly high. For example, at full cost (estimated around $1,200/day), a NEFOP observer would increase the per-day costs of Category A and B single midwater trawl, pair trawl, purse seine and bottom trawl by 28%, 36%, 67%, and 153% respectively (see Table 160 and Table 161 in Section 6.2.6). If the industry contribution is limited to $325 per sea day, the impact on revenues and operating costs is greatly reduced (8%, 11%, 19%, and 45% for midwater trawl, pair trawl, purse seine, and bottom trawl, respectively). The impacts of the industry-funded element of the monitoring program will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5). The firms defined as "small" and "large" by SBA size standards have similar revenue per day and cost-per day figures, with the exception of vessels which use bottom trawl gear. However, vessels which use bottom trawl gear are typically Category D permit holders and the 100% coverage options would not apply to these entities.

Relative to daily revenues, the full cost of an observer would represent about 9%, 8%, 6%, and 22% of average daily revenues for the Category A and B midwater, pair trawl, purse seine, and bottom trawl vessels respectively and significantly less if the industry contribution is $325 per sea day (Table 161). These figures are presented for illustration; it is possible that the type of data required in this fishery could result in higher or lower per-day costs than the $1,200 amount used. The costs of observers and the impacts of the industry-funded element will be more thoroughly evaluated in the action that implements the details of the program (one year following the implementation of Amendment 5).

Alternatives to address Midwater Access to Groundfish Closed Areas (Section 3.4) may also impact small entities. The preferred option (option 4A).requires 100% observer coverage. Depending on funding of observers, this may increase costs of operation for small entities. While Section 3.2.1.2 explicitly includes a waiver process for fishing if no observer is available, Section 3.4.3 (***Preferred Alternative***) does not include a waiver process for fishing in any of the Groundfish Closed Areas if observers are not available. Therefore, the fishing practices of small entities may negatively affected if observers are not available.

The Office of Advocacy at the SBA suggests two criteria to consider in determining the significance of impacts, namely, *disproportionality* and *profitability*. The disproportionality criterion compares the effects of the regulatory action on small versus large entities (using the SBA-approved size definition of "small entity"), not the difference between segments of small entities. Amendment 5 is not expected to have significant regulatory impacts on the basis of the disproportionality criterion. Because Category D permit holders participate minimally in the fishery and would not be subject to the 100% monitoring rule, we focus on the 91 small and 2 large vessels which hold A/B/C permits. Although these measures could affect some vessels within the limited access herring fleet differently than others, these differential impacts are not relevant for the disproportionality criterion. The profitability criterion will apply if the regulation significantly reduces profit for a substantial number of small entities compared to no action scenario. This section provides a summary of the economic impacts expected from the proposed action, alternatives, and the mitigating factors. The relevant sections of Amendment 5, which discuss the rationale and impacts of these measures, are also identified.

8.9.2 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.

8.9.2.1 Statement of the Problem/Goals and Objectives

The purpose of the action and need for management is described in Section 1.4 of this document, and goals and objectives of the management program and Amendment 5 are found in Section 2.0.

8.9.2.2 Management Alternatives and Rationale

The proposed management action is identified as the Council's ***Preferred Alternative*** throughout Section 3.0 of this document (Proposed Management Action and Other Alternatives Considered). The Council's rationale for selecting the ***Preferred Alternative*** is provided in Section 3.0 as well. Management measures that the Council considered but rejected during the development of Amendment 5 are discussed in Section 4.0.

8.9.2.3 Description of the Fishery

Information about fishery-related businesses and communities potentially affected by the measures proposed in Amendment 5 is presented in detail in Section 5.5 of this document.

8.9.2.4 Summary of Impacts

The expected effects of each alternative relative to the status quo for the fishery related businesses and communities are described in Section 6.2. 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 impacts of almost all of the alternatives described in Amendment 5 will be confined to the fishery-related businesses and communities. However, certain alternatives may have effects which spill into other fisheries or onto the federal government.

Alternatives to "Allocate Observer Coverage on Limited Access Herring Vessels" (Section 3.2.1), "River Herring Monitoring/Avoidance" (3.3.2), and Measures to "Address Midwater Trawl Access to Groundfish Closed Areas" (Section 3.4) may change observer coverage of the fishery. Currently, observer coverage is designed to achieve a certain level of precision regarding the estimates of bycatch by allocating coverage various fishing fleets. Observer coverage is costly, therefore it is important to properly allocate observer coverage in order to achieve the desired levels of precision at least cost.

The three alternatives above all propose to change (increase) monitoring of the herring fleet through the use of at-sea monitors. If all additional monitoring costs are paid by industry, then there are no further implications for these alternatives. However, if these costs are not paid by the industry, then they will be paid for by reducing coverage from the current "optimal" allocation of observers. This will result in less data and less precise estimated of catch and bycatch in the fisheries which have fewer observers. While these costs cannot be quantified, the impacts of reallocating observer coverage will be felt by other fisheries. Finally, the creation of a limited access permit category with a higher possession limit for vessels which hold limited access mackerel permits will have positive economic impacts for participants in the mackerel fishery who encounter herring incidentally.

8.9.2.5 Determination of Significance

Based on the analyses provided in this document, Amendment 5 to the Atlantic Herring FMP is not expected to constitute a "significant regulatory action." It is 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. It is 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.

8.10 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. As of the date of submission of this document, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

9.0 DATA AND RESEARCH NEEDS

9.1 AMENDMENT 5 RESEARCH PRIORITIES

During the development of Amendment 5, the Council considered several management approaches and different "tools" to utilize when developing a comprehensive catch monitoring program for the herring fishery. While some of those tools may not yet be fully tested and ready to implement across the herring fishery, there appears to be potential in the near future to utilize them to improve catch monitoring. The Council identified two research priorities for further enhancing catch monitoring in the future: (1) electronic monitoring (EM) applications for net sensors; and (2) EM through the use of video cameras on the vessels. The Council supports and encourages testing and development of these technologies in cooperation with the herring industry.

Explore Net Sensor Technology Through "Study Fleet

The Council encourages research projects to investigate the feasibility of using the study fleet technology in the Atlantic herring fishery and test applications of passive monitoring systems for midwater, bottom trawl, and purse seine vessels. New technologies could be incorporated into the fishery management program as quickly as possible once their applicability and usefulness is tested.

The technology developed by Northeast Fisheries Science Center for the study fleet has significant potential for providing greatly improved monitoring of the herring fishery, including the goal of near real-time TAC-monitoring. As the Council is likely aware from prior briefings by the Science Center, the Study Fleet technology includes a computer, sensors, and software that can be integrated into a ship's systems and VMS, creating a combination of computerized reporting and passive collection of a wide variety of data. This technology can help identify conditions leading to higher rates of bycatch, improve the quality and timeliness of reporting, and, potentially even help measure the extent of slippage.

The industry has suggested that through testing, the technology may be developed to measure incidences of slipped hauls on unobserved trips and provide fine-scale effort data. It may be feasible to tie the computer system (which currently is designed and tested to collect, among other variables, GPS data, vessel speed, and depth/temperature data) into the winch and pump systems. If feasible, this could provide a means by which incidents of slippage – i.e., hauls that are not pumped. This could also help detect whether there is an "observer effect" – i.e., a difference in the incidence of slippage between observed and unobserved trips. The industry has encouraged the Council to identify the testing of this technology as a research priority for funding under the research set-aside program. If it can be successfully adapted to the herring fishery, this monitoring system can provide high quality information in a very cost effective manner.

Explore Video Monitoring Through a Pilot Program

A top priority for cooperative research (including use of future RSA funds, if available) should be to investigate the feasibility of video monitoring in the Atlantic herring fishery through a video monitoring pilot program. Currently, a similar pilot program is underway in the northeast multispecies (groundfish) fishery, which could form the basis of a similar study in the herring fishery.

9.2 OTHER HERRING-RELATED RESEARCH PRIORITIES

In addition, over the last few years, the Council, in consultation with the Herring PDT, has identified several ongoing needs for data and cooperative research in the Atlantic herring fishery. These are listed below and identified as either high, medium, or low priority.

High Priority

- Continue to utilize the inshore and offshore hydroacoustic and trawl surveys to provide an independent means of estimating stock sizes. Collaborative work between NMFS, DFO, state agencies, and the herring industry on acoustic surveys for herring should continue to be encouraged.
- Develop tagging and morphometric studies to explore uncertainties in stock structure and the impacts of harvest mortality on different components of the stock. Although tagging studies may be problematic for assessing survivorship for a species like herring, they may be helpful in identifying the stock components and the proportion of these components taken in the fishery on a seasonal basis.
- Continue commercial catch sampling of Atlantic herring fishery according to ACCSP/ME DMR protocols.
- Organize annual US-Canada workshops to coordinate stock assessment activities and optimize cooperation in management approaches between the two countries.
- Develop a strategy for assessing individual spawning components to better heavily exploited portion(s) of the stock complex.
- Examine the root causes of the discrepancy between Forward Projection and ADAPT assessments.
- Investigate bycatch and discards in the directed herring fishery.
- Synthesize predator/prey information and conduct investigations to address information gaps

Medium Priority

- Develop a stock assessment for the Gulf of Maine component of the stock complex.
- Conduct an otolith methods workshop to address aging differences between DFO, NMFS and ME DMR readers after age 5.
- Investigate possible density-dependence reduced growth rates affecting both the entire complex and inshore subcomponent.

Low Priority

- Develop socio-economic analyses appropriate to the determination of optimum yield.
- Consider potential discards if fishing mortality increases in the future.
- Develop economic analyses necessary to evaluate the costs and benefits associated with different segments of the industry.

9.3 OUTREACH PROGRAMS

The Council recommends that NMFS conduct outreach programs with the implementation of Amendment 5 (and Amendment 14 to the MAFMC's Squid, Mackerel, Butterfish FMP). The reporting requirements for the herring fishery are complex, and compliance will likely improve with a greater understanding of the requirements in both the herring and mackerel regulations.

Outreach Program to Ensure Consistency in Reporting and Improve Compliance

The Council will work with NMFS to structure an outreach program for improving reporting compliance by vessels and dealers once Amendment 5 is implemented. The Atlantic herring fishery is discrete enough that NMFS could work with the majority of participants in the fishery to standardize and clarify reporting requirements and better ensure that landings/catch data are provided to NMFS in a consistent and complete format.

Outreach Program to Foster Cooperation with Catch Monitoring Program

The Council will work with NMFS to structure an outreach program for enhancing communication and fostering cooperation between vessel operators, dealers, processors, and managers upon the implementation of the catch monitoring program proposed in this amendment.

10.0 LIST OF PUBLIC MEETINGS

Table 200 provides a list of all Council-related public meetings during which discussion focused on the development of management measures for consideration in Amendment 5.

Table 200 List of Public Meetings Related to the Development of Amendment 5

DATE	MEETING	LOCATION
November 6-7, 2007	Council Meeting	Newport, RI
March 26, 2008	Herring Oversight Committee	Portland, ME
April 9, 2008	Herring PDT	Mansfield, MA
April 15-17, 2008	Council Meeting	Providence, RI
April 30, 2008	Herring Advisory Panel	Peabody, MA
April 30, 2008	Amendment 4 Scoping Hearing	Peabody, MA
May 22, 2008	Amendment 4 Scoping Hearing	Portland, ME
May 22, 2008	Herring Oversight Committee	Portland, ME
June 2, 2008	Amendment 4 Scoping Hearing	Portland, MA
June 10, 2008	Amendment 4 Scoping Hearing	Atlantic City, NJ
July 30, 2008	Joint Herring Oversight & Advisory Panel	Portland, ME
August 14, 2008	Herring PDT	Danvers, MA
Sept. 30. – Oct. 1, 2008	Herring Oversight Committee	Portland, ME
October 7-9, 2008	Council Meeting	Mystic, CT
November 12, 2008	Herring PDT	Mansfield, MA
December 16, 2008	Herring Oversight Committee	Danvers, MA
February 9-11, 2009	Council Meeting	Portsmouth, NH
January 14, 2009	Herring PDT	Mansfield, MA
January 28, 2009	Herring Oversight Committee	Warwick, RI
March 24, 2009	Herring Oversight Committee	Portland, ME
April 7-9, 2009	Council Meeting	Mystic, CT
May 8, 2009	Enforcement Committee	Danvers, MA
May 14, 2009	Herring Advisory Panel	Portsmouth, NH
May 26, 2009	Herring PDT	Mansfield, MA
June 4-5, 2009	Herring Oversight Committee	Portland, ME
June 22-25, 2009	Council Meeting	Portland, ME
November 17-19, 2009	Council Meeting	Newport, RI
January 6 7 11, 2010	Public Hearing	Gloucester, MA
January 7, 2010	Public Hearing	Fairhaven, MA
January 11, 2010	Public Hearing	Portland, ME
March 30-31, 2010	Herring Oversight Committee	Portland, ME
April 8, 2010	Herring PDT	Mansfield, MA
May 17, 2010	Herring Oversight Committee	Portsmouth, NH
June 15, 2010	Herring PDT	Mansfield, MA
July 15, 2010	Herring PDT	Mansfield, MA
July 27-28, 2010	Herring Oversight Committee	Portland, ME
August 19, 2010	Herring PDT	Mansfield, MA
August 25, 2010	Herring Advisory Panel	Portland, ME
September 1-2, 2010	Herring Oversight Committee	Portsmouth, NH

October 4, 2010	Herring PDT Conference Call	N/A
November 30, 2010	Herring Oversight Committee	Portsmouth, NH
December 2, 2010	Herring PDT	Mansfield, MA
December 20, 2010	Herring Oversight Committee	Portsmouth, NH
January 25-27, 2011	Council Meeting	Portsmouth, NH
February 24, 2011	Herring PDT	Newburyport, MA
April 26-28, 2011	Council Meeting	Mystic, CT
May 11, 2011	Herring PDT	Mansfield, MA
June 21-23, 3011	Council Meeting	Portland, ME
June 29, 2011	Herring PDT	Gloucester, MA
August 10, 2011	Herring PDT	Mansfield, MA
August 31, 2011	Herring PDT Conference Call	N/A
September 7, 2011	Herring PDT Conference Call	N/A
Sept. 22, 2011	Herring Advisory Panel	Danvers, MA
November 3, 2011	Herring PDT Conference Call	N/A
November 14-16, 2011	Council Meeting	Newport, RI
March 14, 2012	Amendment 5 Public Hearing	Annisquam, MA
March 15, 2012	Amendment 5 Public Hearing	Portsmouth, NH
March 19, 2012	Amendment 5 Public Hearing	Fairhaven, MA
March 21, 2012	Amendment 5 Public Hearing	Portland, MA
March 27, 2012	Amendment 5 Public Hearing	Plymouth, MA
March 28, 2012	Amendment 5 Public Hearing	Warwick, RI
March 29, 2012	Amendment 5 Public Hearing	Cape May, NJ
May 22, 2012	Herring PDT and MAFMC FMAT	Warwick, RI
May 31, 2012	Herring Advisory Panel	Peabody, MA
June 6, 2012	Herring Oversight Committee	Plymouth, MA
June 19-21, 2012	Council Meeting	Portland, ME

11.0 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
- Talia Bigelow and Rachel Neild, NEFMC Staff
- Michelle Bachman, NEFMC Staff
- Matt Cieri, ME DMR Biologist, ASMFC Herring TC Chair
- Amy van Atten, Sara Weeks, Debra Duarte, 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
- Timothy Cardiasmenos, Lindsey Feldman, Aja Szumylo, Robert Vincent, NMFS NERO
- Chris Vonderweidt, and Bob Beal, ASMFC Staff

The following agencies were consulted during the development of Amendment 5, either through direct communication/correspondence and/or participation on the Herring Committee or Herring PDT:

- NOAA Fisheries, National Marine Fisheries Service, Northeast Regional Office, Gloucester MA
- Northeast Fisheries Science Center, Woods Hole MA
- Atlantic States Marine Fisheries Commission and Atlantic Herring Section
- Mid-Atlantic Fishery Management Council

12.0 GLOSSARY

ABC: Acceptable Biological Catch. 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. ABC should be based on F_{MSY} or its proxy for the stock if overfishing is not occurring and/or the stock is not in a rebuilding program, and should be based on the rebuilding fishing mortality (F_{reb}) rate for the stock if it is in a rebuilding program. The specification of ABC will consider scientific uncertainty and will be recommended to the Council by its Scientific and Statistical Committee.

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.

ACL: Annual Catch Limit. 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 serves as the level of catch that determines whether accountability measures (AMs) become effective.

Adult stage. one of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect. any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation. a group of animals or plants occurring together in a particular location or region.

AM: Accountability Measure(s). 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.

Anadromous species. fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amendment. a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure" (see below). The Commission prepares amendments and submits them to the Commission's Atlantic Herring Section for approval. Implementing regulations are adopted by the states.

Atlantic herring. *Clupea h. harengus*. The species that will be managed by the management plans developed by the Council and the Commission and described in this document. Sometimes referred to as sea herring.

Benthic community. *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom.

B_{MSY}. stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$.– 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$.

B_{target}. desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Bycatch. 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.

Capacity. the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch. Catch is defined in the NS1 Guidelines as the total quantity of fish, measured in weight or numbers of fish, taken in commercial, recreational, subsistence, tribal, and other fisheries. Catch includes fish that are retained for any purpose, as well as mortality of fish that are discarded. The ACLs established for the herring fishery should relate to total catch in the fishery, including landings and discards.

Continental shelf waters. waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Crustaceans. invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent. an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Demersal species. most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Ecosystem-based management. a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective.

Egg stage. one of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch. any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment. a bay or an indentation in a coastline resembling a bay.

Environmental Impact Statement (EIS). an analysis of the expected impacts of a fishery management plan (or some other Proposed Action) on the environment and on people, initially prepared as a "Draft" (DEIS) for public comment. After an initial EIS is prepared for a plan, subsequent analyses are called "Supplemental" (i.e., DSEIS, FSEIS).

Essential Fish Habitat (EFH). those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Exclusive Economic Zone (EEZ). for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exploitation rate. the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fathom. a measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing effort. the amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size and horsepower.

Fishing mortality (F). (see Mortality)

FMP (Fishery Management Plan). also referred to as a "plan," this is a document that describes a fishery and establishes measures to manage it. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation. The Atlantic States Marine Fisheries Commission prepares FMPs and implementing regulations are adopted by the States.

Framework Adjustments. adjustments within a range of measures previously specified in a fishery management plan (FMP). A change can usually be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Gonadosomatic Index (GSI). a measure of the stage of spawning condition.

GRT. gross registered tons. Measure of vessel size based on volume.

Internal Waters Processing (IWP). an operation by a foreign vessel processing fish caught by U. S. vessels. The foreign vessel is located in the internal waters of a state. "IWP" is usually a reference to the fish allocated for these operations.

Joint Venture (JV). any operation by a foreign vessel assisting fishing by U.S. fishing vessels, including catching, scouting, processing and/or support. (A joint venture generally entails a foreign vessel processing fish received from U.S. fishing vessels and conducting associated support activities.) "JVP" is usually a reference to the fish allocated for joint venture operations.

Juvenile stage. one of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings. the portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage. one of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited entry (or access). a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation and the participants remain constant over time (with the exception of attrition).

Meter. a measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton. a unit of weight equal to a thousand kilograms (1 kg = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Mortality

Fishing mortality (F). (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. Fishing mortality (F) is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

$\mathbf{F_{target}}$ – the fishing mortality that management measures are designed to achieve.

Natural mortality (M). a measurement of the rate of fish deaths from all other causes other than fishing such as predation, disease, starvation and pollution. The rate of natural mortality may vary from species to species.

Total mortality. the rate of mortality from all sources (fishing, natural, pollution). Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year).

Minimum biomass level. the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term. If a stock is at this level, fishing mortality must be reduced to as near zero as possible until the stock rebuilds.

Observer. any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this action.

OFL: Overfishing Level. 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. Catches that exceed this amount would be expected to result in overfishing. The annual OFL can fluctuate above and below MSY depending on the current size of the stock. This specification will replace the current specification of *allowable biological catch* in the herring fishery.

Open access. describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum Yield (OY). the amount of fish which –
(a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;
(b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and
(c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished. a conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing. a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Pelagic gear. mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are midwater trawls and pelagic longlines.

Plan Development Team (PDT). a group of technical experts responsible for developing and analyzing management measures under the direction of the Council or the ASMFC. The ASMFC uses the term **Technical Committee** during the development of a plan and **Plan Review Team** after a plan is adopted.

Prey availability. the availability or accessibility of prey (food, **forage**) to a predator. Important for growth and survival.

Primary production. the synthesis of organic materials from inorganic substances by photosynthesis.

Proposed rule. a federal regulation is usually published in the *Federal Register* as a proposed rule with a time period for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding schedule. a plan to increase the biomass of a fishery stock, based on a target fishing mortality applied over a period of time.

Recovery time. the period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment. the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be recruitment to the fishery.

Recruitment overfishing. fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regional Administrator. Regional Administrator, NOAA/NMFS Northeast Region, Gloucester, MA.

Regulated groundfish species. cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation. an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Secretarial review process. a process which normally takes 140 days from the time the Council submits a plan or amendment to the Secretary of Commerce until its implementation. The Secretary of Commerce reviews and possibly approves the plan or amendment which must meet the National Standards established by the Magnuson Stevens Fishery Conservation and Management Act as well as other federal requirements (the National Environmental Policy Act, the Marine Mammal Protection Act, the Endangered Species Act and other applicable law.)

Spawning component. reference to a group of herring that spawn in a general location. There is evidence herring return to the same areas to spawn. These fish may, in fact, comprise different "stocks" but the evidence is ambiguous; they are identified as components to allow the development of measures for their protection. A healthy herring resource depends on maintaining spawning in as many areas as possible.

Spawning stock biomass (SSB). the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Species assemblage. several species occurring together in a particular location or region

Species composition. a term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity. the number of different species in an area and their relative abundance.

Species richness. see *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Status Determination. a determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock. a grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species.

Stock assessment. a process for determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock.

Technical Committee. a group of biologists assembled by the Commission to assess the (herring) resource.

Tolerance. a reference to a management measure used in the original Commission herring management plan. This measure allows fishing in a spawning closure as long as only a certain percentage of the fish caught contain spawn (roe or milt).

VMS. an electronic vessel monitoring system, which may also be used for communications. Previously referred to as a vessel tracking system, or VTS.

Year class. also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc.

13.0 INDEX

ACLs, iii, v, xvi, xix, 1, 3, 5, 6, 8, 14, 36, 104, 194, 202, 242, 243, 244, 246, 247, 248, 309, 360, 363, 367, 371, 378, 379, 381, 384, 385, 386, 387, 389, 395, 421, 426, 435, 467, 468, 469, 472, 473, 474, 477, 488, 490, 498, 499, 535, 536, 543, 551, 554, 559, 565, 572, 575, 581, 591, 597, 614, 633

Affected Environment, iii, v, xiv, xxiii, 2, 118, 359, 361, 365, 372, 375, 386, 405, 406, 409, 410, 428, 435, 473, 478, 479, 486, 492, 548, 549, 570, 591, 592, 596, 598

AMs, iii, 1, 5, 6, 194, 498, 499, 551, 554, 559, 565, 581, 632

ASMFC, iii, v, viii, x, xxiii, 1, 3, 8, 13, 62, 93, 94, 105, 108, 110, 174, 175, 176, 177, 178, 179, 180, 181, 182, 184, 185, 186, 223, 227, 233, 240, 293, 294, 297, 298, 486, 487, 492, 493, 532, 551, 553, 565, 568, 582, 584, 592, 594, 600, 601, 610, 631, 636, 641, 647

Atlantic herring, iii, iv, v, vi, vii, ix, x, xi, xiv, xvi, xviii, xx, 1, 3, 4, 7, 8, 13, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 31, 32, 33, 35, 36, 39, 41, 42, 43, 44, 46, 47, 50, 53, 58, 60, 61, 62, 63, 64, 67, 68, 69, 70, 79, 81, 82, 93, 94, 97, 100, 103, 104,107, 108, 115, 116, 118, 119, 121, 122, 138, 139, 140, 141, 142, 143, 144, 146, 147, 149, 150, 152, 154, 165, 168, 169, 170, 172, 173, 190, 191, 192, 201, 205, 210, 216, 223, 224, 225, 226, 238, 240, 242, 243, 244, 246, 247, 249, 252, 280, 284, 285, 287, 300, 301, 308, 309, 310, 311, 315, 317, 318, 320, 321, 324, 329, 331, 343, 348, 351, 353, 356, 358, 359, 360, 361, 362, 363, 365, 367, 368, 369, 371, 372, 373, 374, 375, 376, 378, 379, 380, 383, 384, 385, 386, 388, 391, 392, 393, 395, 396, 397, 398, 401, 403, 404, 406, 408, 409, 410, 413, 418, 421, 423, 424, 425, 430, 432, 434, 435, 437, 438, 461, 466, 467, 468, 469, 472, 477, 479, 480, 486, 488, 489, 490, 491, 494, 496, 497, 498, 500, 501, 514, 516, 517, 521, 522, 528, 529, 532, 533, 535, 536, 537, 544, 545, 546, 548, 549, 550, 551, 552, 554, 558, 561, 562, 564, 565, 566, 572, 574, 576, 579, 581, 582, 583, 584, 585, 586, 591, 592, 593, 594, 595, 596, 597, 600, 602, 604, 605, 608, 609, 610, 613, 615, 618, 619, 626, 627, 628, 632, 641, 642, 645, 647, 650

Atlantic mackerel, vii, 6, 35, 36, 149, 152, 168, 172, 190, 191, 216, 238, 249, 285, 289, 351, 373, 383, 388, 393, 432, 493, 594, 595

bottom trawl, xii, xiii, xx, xxi, 21, 57, 115, 122, 127, 135, 150, 153, 154, 165, 169, 172, 173, 190, 194, 224, 267, 411, 423, 424, 433, 438, 439, 507, 508, 516, 525, 576, 577, 588, 601, 607, 622, 623, 626

bycatch, i, iii, iv, v, vi, vii, viii, ix, x, xii, xiii, xvii, xix, xx, xxii, 1, 3, 6, 7, 9, 12, 14, 15, 17, 20, 29, 30, 33, 34, 35, 36, 43, 51, 52, 54, 56, 57, 58, 63, 67, 69, 79, 80, 81, 93, 94, 95, 98, 100, 101, 102, 106, 107, 108, 112, 113, 115, 116, 117, 152, 155, 167, 168, 169, 170, 171, 172, 173, 181, 183, 196, 224, 227, 232, 233, 234, 284, 286, 287, 294, 359, 377, 378, 383, 384, 386, 387, 389, 391, 392, 393, 394, 396, 401, 404, 405, 406, 408, 409, 410, 414, 418, 420, 432, 434, 446, 462, 465, 466, 467, 468, 469, 470, 471,

477, 478, 479, 480, 481, 485, 486, 488, 490, 491, 492, 494, 495, 496, 498, 499, 501, 502, 503, 505, 514, 516, 521, 522, 523, 525, 526, 527, 528, 533, 534, 535, 541, 542, 544, 552, 560, 561, 563, 564, 566, 568, 573, 575, 576, 578, 579, 580, 582, 583, 586, 587, 588, 589, 590, 592, 595, 596, 599, 600, 601, 604, 605, 607, 608, 609, 610, 611, 612, 613, 616, 619, 622, 624, 625, 626, 627, 633, 641, 642, 644, 648, 650
carrier vessels, iv, x, 18, 19, 20, 22, 23, 26, 28, 30, 103, 109, 360, 362, 363, 364, 365, 366, 370, 604, 613
catch monitoring, i, iv, vi, vii, viii, ix, x, xii, xv, 6, 12, 14, 15, 17, 18, 20, 23, 25, 33, 36, 38, 41, 43, 44, 52, 58, 60, 62, 63, 67, 79, 102, 109, 110, 113, 114, 115, 116, 155, 243, 359, 360, 362, 371, 391, 425, 434, 438, 465, 466, 468, 485, 486, 488, 489, 490, 495,505, 522, 530, 535, 552, 561, 571, 580, 581, 582, 583, 584, 585, 586, 587, 590, 592, 594, 596, 599, 602, 603, 608, 610, 613, 618, 626, 628
Closed Area I sampling, v, vii, viii, xiv, 58, 75, 98, 99, 445, 468, 485, 495, 505, 513, 534, 535, 536, 545, 588, 590
Essential Fish Habitat, 649
Fishery-Related Businesses and Communities, v, x, 8, 118, 240, 362, 363, 364, 365, 369, 373, 381, 386, 387, 398, 421, 426, 427, 429, 433, 436, 472, 479, 495, 497, 505, 516, 527, 545, 548, 565, 580, 596
forage, 7, 9, 10, 11, 12, 13, 14, 146, 147, 149, 300, 311, 421, 505, 516, 591, 593, 596, 615, 636
framework adjustment, v, xx, 35, 64, 79, 80, 81, 82, 93, 94, 102, 111, 116, 152, 393, 432, 484, 532, 533, 576, 584, 589, 592, 595, 600, 610, 632, 634
funding options, xii, xvii, xxii, 45, 47, 374, 397, 404, 409, 415, 417, 419, 427, 507, 573, 578
Gloucester, 341
haddock, viii, xvii, xxii, 5, 8, 9, 29, 31, 46, 47, 49, 72, 73, 74, 87, 88, 89, 97, 98, 100, 105, 107, 108, 111, 150, 157, 196, 197, 199, 200, 201, 202, 207, 208, 285, 286, 287, 293, 314, 319, 330, 335, 338, 355, 357, 401, 403, 408, 410, 413, 414, 420, 493, 496, 499, 514, 517, 531, 534, 537, 538, 541, 542, 543, 544, 551, 552, 554, 558, 562, 565, 573, 578, 587, 592, 612, 637
incidental catch, iii, iv, 4, 8, 16, 33, 34, 35, 36, 37, 63, 103, 224, 249, 259, 264, 269, 389, 521, 522, 586, 587, 613
industry-funded, v, xii, xiii, xiv, 38, 40, 41, 42, 43, 44, 102, 152, 390, 392, 393, 396, 397, 404, 405, 408, 409, 415, 416, 418, 419, 422, 423, 424, 426, 427, 428, 432, 506, 507, 513, 546, 552, 558, 561, 585, 595, 599, 602, 603, 609, 622, 623
LOAs, 20, 23, 280, 282, 283, 366, 555
lobster bait, xv, 9, 277, 289, 292, 298, 299, 300, 315, 317, 318, 320, 321, 324, 326, 329, 331, 343, 348, 351, 356, 571
mackerel vessels, v, ix, x, xi, xvi, 7, 34, 36, 84, 102, 192, 373, 383, 384, 385, 386, 388, 389, 555, 557, 572
MAFMC, iii, xxiv, 1, 41, 62, 93, 103, 105, 107, 190, 191, 194, 223, 249, 297, 493, 553, 555, 556, 557, 558, 559, 560, 628, 630, 647
management uncertainty, v, vi, x, xi, xvi, 190, 243, 360, 362, 363, 367, 371, 372, 373, 378, 385, 395, 396, 421, 426, 435, 467, 477, 488, 490, 498, 499, 535, 536, 572, 581, 583, 585, 597, 613
maximized retention, v, xix, 7, 38, 60, 61, 62, 105, 106, 107, 112, 113, 434, 476, 477, 478, 479, 575
midwater trawl, i, iv, v, vi, vii, viii, ix, x, xii, xiv, xix, xxii, 5, 6, 7, 21, 27, 28, 29, 31, 57, 58, 96, 97, 98, 99, 100, 101, 117, 119, 154, 155, 156, 169, 170, 172, 190, 194, 196, 201, 224, 225, 238, 239, 285, 286, 287, 330, 352, 354, 373, 374, 408, 414, 423, 424, 429, 430, 437, 438, 439, 440, 445, 446, 455, 459, 475, 502, 508, 534, 535, 536, 537, 541, 542, 543, 544, 545, 546, 547, 552, 554, 555, 563, 565, 575, 578, 580, 588, 590, 604, 606, 607, 611, 612, 622
NEPA, i, iii, xxiv, 1, 2, 6, 307, 309, 548, 551, 554, 565, 579, 597, 601, 602, 603, 609, 615
New England Fishery Management Council, 645
Non-Target Species and Other Fisheries, v, vii, 118, 152, 361, 364, 368, 372, 380, 382, 386, 405, 409, 410, 435, 469, 478, 491, 492, 494, 495, 497, 499, 537, 548, 553, 568, 579
Northeast multispecies, vii, 152, 196, 365, 393, 432, 595
observer coverage, v, vi, vii, viii, ix, xii, xiii, xiv, xvi, xvii, xxii, 7, 9, 11, 28, 29, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 63, 68, 70, 75, 79, 97, 98, 99, 101, 102, 108, 109, 111, 115, 116, 117, 374, 390, 391, 392, 393, 394, 395, 396, 397, 398, 401, 403, 404, 405,406, 408, 409, 410, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 432, 433, 437, 440, 441, 446, 453, 459, 474, 475, 481, 485, 489, 495, 505, 506, 507, 508, 509, 514, 515, 523, 526, 528, 530, 534, 535, 536, 537, 541, 542, 543, 544, 545, 546, 547, 554, 560, 565, 572, 573, 578, 585, 587, 588, 590, 595, 599, 602, 603, 604, 605, 607, 609, 612, 622, 623, 624, 625

offload, iv, xv, 17, 22, 103, 104, 113, 361, 571
pair trawl, xi, xii, xiii, xviii, 8, 10, 11, 18, 51, 113, 153, 154, 190, 238, 239, 267, 369, 423, 424, 434, 435, 438, 440, 453, 455, 459, 473, 475, 508, 514, 537, 574, 622, 623
Physical Environment and Essential Fish Habitat (EFH), v, 118, 548, 562
Portland, 313
pre-trip notification, xvi, 26, 27, 28, 29, 38, 41, 42, 68, 69, 70, 98, 99, 371, 372, 374, 390, 396, 405, 406, 416, 418, 427, 545, 555, 572, 613
Protected Resources, v, ix, xv, xvi, xvii, xviii, xix, xx, xxi, xxii, 118, 227, 237, 361, 364, 368, 373, 380, 382, 387, 417, 418, 420, 436, 471, 479, 503, 504, 544, 548, 563, 569, 571, 572, 573, 574, 575, 576, 577, 578, 580, 598
purse seine, xii, xiii, xiv, xviii, xix, xxii, 5, 11, 12, 17, 19, 21, 27, 29, 51, 52, 53, 57, 59, 62, 100, 113, 119, 121, 153, 154, 155, 157, 173, 190, 224, 238, 239, 267, 318, 370, 373, 374, 423, 424, 430, 434, 437, 438, 439, 440, 445, 453, 455, 458, 467, 472, 475, 507, 508, 513, 517, 547, 555, 574, 575, 578, 606, 607, 622, 623, 626
regulatory definitions, vi, xv, 17, 359, 360, 361, 362, 571
reporting requirements, iv, 4, 7, 15, 19, 21, 24, 25, 26, 31, 33, 35, 36, 37, 38, 62, 102, 104, 201, 246, 359, 367, 368, 369, 370, 373, 375, 378, 381, 387, 389, 481, 490, 579, 584, 614, 618, 628
RFA, i, iii, xxv, 1, 615, 621, 622, 651
river herring, i, iii, iv, v, vi, vii, viii, ix, x, xii, xvii, xx, xxi, xxii, 2, 6, 7, 12, 16, 28, 30, 33, 38, 42, 46, 47, 63, 64, 67, 70, 72, 73, 74, 75, 79, 80, 81, 82, 85, 87, 88, 89, 90, 93, 94, 95, 102, 105, 106, 108, 110, 113, 115, 116, 165, 168, 169, 172, 173, 175, 178, 181, 182, 183, 186, 227, 380, 386, 390, 391, 394, 396, 401, 403, 405, 406, 409, 410, 413, 416, 418, 420, 427, 480, 481, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 505, 506, 514, 515, 516, 517, 518, 521, 522, 523, 525, 526, 527, 529, 530, 532, 533, 534, 535, 548, 552, 553, 554, 558, 559, 561, 565, 567, 568, 573, 576, 577, 578, 579, 580, 583, 586, 587, 588, 589, 599, 600, 601, 608, 609, 610, 611, 622, 641, 642, 645
river herring catch cap, v, 81, 94, 484, 532, 589, 600, 601, 610
River Herring Monitoring/Avoidance Areas, v, vii, xiii, 38, 42, 63, 64, 65, 66, 67, 68, 69, 70, 75, 76, 77, 78, 79, 80, 102, 390, 396, 405, 416, 418, 422, 427, 480, 481, 482, 485, 488, 489, 490, 495, 496, 502, 505, 506, 507, 509, 513, 588
scientific uncertainty, v, vi, x, xi, 146, 246, 360, 362, 363, 367, 371, 373, 378, 385, 395, 396, 421, 426, 435, 468, 469, 477, 488, 489, 490, 498, 499, 535, 536, 581, 583, 613, 632
slippage, iv, v, vi, vii, xi, xii, xviii, xix, 29, 38, 53, 55, 56, 57, 58, 59, 62, 63, 100, 102, 110, 111, 112, 434, 437, 438, 441, 442, 446, 447, 453, 455, 456, 457, 458, 459, 462, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 485, 489, 495, 506, 531, 557, 574, 575, 587, 588, 590, 602, 604, 605, 606, 607, 612, 626
transfer at sea, xv, 17, 103, 361, 368, 571
transfers at-sea, iv, 368, 370
trip termination, v, vi, viii, xi, xii, xix, 55, 56, 57, 58, 59, 100, 102, 112, 458, 465, 467, 469, 470, 471, 473, 474, 475, 534, 545, 557, 575, 580, 588, 591, 602, 606, 607
VECs, i, v, xiv, xv, xvi, xvii, xviii, xix, xx, xxi, xxii, 118, 359, 382, 390, 434, 465, 480, 532, 533, 535, 548, 549, 550, 551, 552, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 615
VMS, iv, x, xv, xvi, xxv, 7, 18, 19, 20, 22, 23, 24, 25, 27, 28, 29, 30, 32, 40, 41, 53, 55, 56, 72, 87, 103, 104, 113, 240, 242, 243, 244, 246, 247, 273, 280, 359, 360, 361, 362, 363, 364, 365, 366, 371, 372, 374, 379, 406, 467, 555, 571, 572, 592, 613, 626,638, 649

14.0 REFERENCES

Ames, Edward P. 2004. Atlantic Cod Stock Structure in the Gulf of Maine in Fisheries 29, 1, 10-28 (January).

Anthony, V.C. and G. Waring. 1980. The assessment and management of the Georges Bank herring fishery. Rapp. P.-v. Reun. Cons. Int. Explor. Mer 177: 72-111

Aguilar, A. 2002. Fin whale, Balaenoptera physalus. In: Perrin, W.F., B. Würsig and J.G.M. Thewissen(eds) Encyclopedia of Marine Mammals. pp 435-438.

ASMFC TC (Atlantic States Marine Fisheries Commission Technical Committee). 2007. Special Report to the Atlantic Sturgeon Management Board: Estimation of Atlantic sturgeon bycatch in coastal Atlantic commercial fisheries of New England and the Mid-Atlantic. August 2007. 95 pp.

ASSRT (Atlantic Sturgeon Status Review Team). 2007. Status review of Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus). National Marine Fisheries Service. February 23, 2007. 188 pp.Atlantic Herring Amendment 1 Implementation Small Entity Compliance Guide, Department of Commerce, National Marine Fisheries Service, Northeast Region, March 9, 2007

Best, P.B., J. L. Bannister, R.L. Brownell, Jr., and G.P. Donovan (eds.). 2001. Right whales: worldwide status. J. Cetacean Res. Manage. (Special Issue) 2. 309pp.

Bethoney ND. 2012. Avoidance program IDs river herring hot spots. Commercial Fisheries News 39(9):21-22.

Bolles, Karen L. 2006. Morphometric discrimination among Atlantic herring (Clupea harengus) in the northwestern Atlantic ocean. Thesis (M.S.)--University of Massachusetts Amherst. 76 pp.

Bowen, B.W., A.L. Bass, S.-M. Chow, M. Bostrom, K.A. Bjorndal, A.B. Bolten, T. Okuyama, B.M. Bolker., S. Epperly, E. Lacasella, D. Shaver, M. Dodd, S.R. Hopkins-Murphy, J.A. Musick, M. Swingle, K. Rankin-Baransky, W. Teas, W.N. Witzell, and P.H. Dutton. 2004. Natal homing in juvenile loggerhead turtles (Caretta caretta). Molecular Ecology 13:3797-3808. CBS News-Canada. 2010. P.E.I. tuna catch reaches quota in 2 days. September 6, 2010. Viewed online November 10, 2011 http://www.cbc.ca/news/canada/prince-edward-island/story/2010/10/06/pei-tuna.html

Braun-McNeill, J., and S.P. Epperly. 2004. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). Mar. Fish. Rev. 64(4):50-56.

Breton-Honeyman, K., C. Furgal, M. Hammill, W. Doidge, V. Lesage, B. Hickie. 2010. Investigation of Beluga (Delphinapterus leucas) Habitat Ecology Through Traditional Ecological Knowledge (TEK) in Northern Quebec (Nunavik), Canada. Presented at State of the Arctic. March 16-19. http://soa.arcus.org/abstracts/investigation-beluga-delphinapterus-leucas-habitat-ecology-through-traditional-ecological-

Brown, M.W., O.C. Nichols, M.K. Marx, and J.N. Ciano. 2002. Surveillance of North Atlantic right whales in Cape Cod Bay and adjacent waters—2002. Final Report to the Division of Marine Fisheries, Commonwealth of Massachusetts. 29pp.

Cape May County. June 26, 2006 “Beach Conference 2006-Presentation by Freeholder Desiderio”.. Web. http://www.capemaycountygov.net/Cit-e-Access/news/archnews.cfm?NID=5711&TID=5&jump2=0

CBS News-Canada. 2010. P.E.I. tuna catch reaches quota in 2 days. September 6, 2010. Viewed online November 10, 2011 http://www.cbc.ca/news/canada/prince-edward-island/story/2010/10/06/pei-tuna.html

CEI. 2002. “Preserving Commercial Fishing Access: A Study of Working Waterfronts in 25 Maine Communities”. A report by Coastal Enterprises, Inc. submitted to the Maine State Planning Office Coastal Program. 2002.

Cetacean and Turtle Assessment Program (CeTAP). 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report #AA551-CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp.

Chase, Bradford. 2002. “Differences in diet of Atlantic bluefin tuna (Thunnus thynnus) at five seasonal fishing grounds on the New England continental shelf.” Fishery Bulletin 100: 168-180.

CHOIR Coalition. 2011. “About Us.” http://www.choircoalition.org/ Viewed online November 7, 2011.

Cieri, M. 2011. 2010 estimate of rive herring catch. Prepared for the DEIS for NEFMC Herring FMP A5.

Cieri, M., G. Nelson, and M. A. Armstrong. 2008. Estimates of river herring bycatch in the directed Atlantic herring fishery. Report prepared for the Atlantic States Marine Fisheries Commission, Washington, DC. September 23, 2008.

Clapham PJ, et al. 2002. The JARPN II program: A critique. Paper SC/54/O26 presented to the IWC Scientific Committee. Available at: www.nefsc.noaa.gov/psb/pubs/jarpn2.pdf.

Clapham, P.J., S.B. Young, and R.L. Brownell. 1999. Baleen whales: Conservation issues and the status of the most endangered populations. Mammal Rev. 29(1):35-60

Claw Island. August 19, 2011. N.d. Web. <http://clawislandfoods.com/ >.

Colvocoresses, J. and J. Musick (1984). "Species associations and community composition of Middle-Atlantic Bight continental shelf demersal fishes." Fishery Bulletin 82: 295-313.

Conant, T.A., P.H. Dutton, T. Eguchi, S.P. Epperly, C.C. Fahy, M.H. Godfrey, S.L. MacPherson, E.E. Possardt, B.A. Schroeder, J.A. Seminoff, M.L. Snover, C.M. Upite, and B.E. Witherington. 2009. Loggerhead sea turtle (Caretta caretta) 2009 status review under the U.S. Endangered Species Act. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service, August 2009. 222 pp.Cournane, J. M., M. Cieri, and S. J. Correia. 2010. Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery. Report prepared for the NEFMC Atlantic Herring PDT. December 2010.

Coastal Conservation Association of New Hampshire. 2009. “Home”. Nd. Web. <http://www.ccanh.org/>

Coastal Enterprises, Inc. August 19, 2011. “A Development Approach to Fisheries and Maine’s Working Waterfront.” n.d. Web. < http://www.ceimaine.org/Fisheries >.

Community Development Department. August 19, 2011. City of Portsmouth Demographic Profile. Web. http://www.cityofportsmouth.com/community/demographic-profile.htm.

Cournane, J. M., M. Cieri, and S. J. Correia. 2010. Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery. Report prepared for the NEFMC Atlantic Herring PDT. December 2010.

Dadswell, M. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. Fisheries 31: 218-229.

Dovel, W. L. and T. J. Berggren. 1983. Atlantic sturgeon of the Hudson River estuary, New York. New York Fish and Game Journal 30: 140-172.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (Acipenser oxyrinchus) within the Northwest Atlantic Ocean determined from five fishery-independent surveys. Fish. Bull. 108:450-465.

Fintalk.com. August 19, 2011. "Point Pleasant Beach, Cape May, NJ. New Jersey Fishing Charters". Nd. Web. http://www.fintalk.com/business/new-jersey-fishing.html

Fisheries and Oceans Canada. 2006. Atlantic Bluefin Tuna management plan (effective 2007). Accessed online

Fisheries Survival Fund. August 19, 2011. "Welcome to the FSF Homepage". N.d. Web. http://www.fisheriessurvival.org/

Fishing Partnership Health Plan. August 19, 2011. "Providing Access to Health Coverage, Services and Education for Commercial Fishing Families". N.d. Web. http://www.fphp.org/index.html

Fogarty, M. and R. Myers. 1998. Implications of Localized Stocks for Analysis of Fisheries catch and Survey data. In I. H. von Herbing, I Kornfield, M. Tupper and J. Wilson, eds. The Implication of Localized Fishery Stocks: Proceedings from a conference sponsored by the U. of Maine and Maine Sea Grant Program. South Portland, ME. Oct 31-Nov 1, 1997.

French, Edward 2011. Perry Marine plans to set up site in Eastport. *Quoddy Tides* 43:6 (February 25).

Cape-Ann.com. August 19, 2011. "Gloucester, Massachusetts -Fishing Charters". N.d. Web. http://www.cape-ann.com/gloucester.html.

Cape Ann Fresh Catch. August 19, 2011. "Community Supported Fisheries." N.d. Web. http://www.capeannfreshcatch.org/.

Commercial Fisheries Center of Rhode Island. August 19, 2011. "About the Commercial Fisheries Center of Rhode Island". N.d. Web. http://cfcri.com/about.htm

Gabriel, W. L. (1992). Persistence of demersal fish assemblages between Cape Hatteras and Nova Scotia, Northwest Atlantic. J. Northw. Atl. Fish. Sci. 14: 29-46.

Gaines, Richard. April 21, 2011. "Fishing Health-Care Coverage Folding." Gloucester Times. Web. < http://www.gloucestertimes.com/local/x69807474/Fishing-health-care-coverage-folding>.

Garden State Seafood Association. August 19, 2011. "A Voice for the Fish and Seafood Industry Throughout New Jersey"; "Cape May/Wildwood". N.d. Web. http://www.fishingnj.org/gssa/gssahome.htm

Garland, Joseph. 1995. Gloucester on the Wind. NH: Arcadia Publishing.

Gauvin JR, Haflinger K, Nerini M. 1996. Solving bycatch: Considerations for today and tomorrow - implementation of a voluntary bycatch avoidance program in the flatfish fisheries of the eastern Bering sea. Fairbanks, AK: Alaska University. Report nr 96-03. 79 p.

GMRI. August 19, 2011. "The Gulf of Maine Research Institute." n.d. Web. http://www.gmri.org/

Go Fish Charters. "Fishing the Coastal and Offshore Waters of Southern Maine. August 19, 2011. Web. n.d. http://www.gofishmaine.com/

Great Bay Aquaculture. August 19, 2011. "About GreatBay Aquaculture." N.d. Web. <http://www.gbanh.com/aboutus.html>

Great Bay National Estuarine Research Reserve. August 19, 2011. "Visit Us." N.d. Web. http://greatbay.nh.gov/visit/index.htm.

Hall-Arber, M. C. Dyer, J. Poggie, J. McNally; R. Gagne. 2001. New England's Fishing Communities. Cambridge: MIT Sea Grant College Program. MITSG 01-15

Hampton Area Chamber of Commerce. August 19, 2011. "Business Directory". n.d. Web. http://216.247.60.150/directory.cfm.

Hampton Library. August 19, 2011 "The Hampton Beach Masterplan". N.d. Web. http://www.hampton.lib.nh.us/hampton/town/masterplan/mastplan3e.htm

Harbormasters.org. August 19, 2011. "City of Gloucester. N.d. Web. <http://www.harbormasters.org/cities/gloucester.shtml>.

Harrington, J.M., Myers, R. A. and A. A. Rosenberg. 2005. Wasted fishery resources: discarded bycatch in the USA. *Fish and Fisheries*, 6(4), pp. 350–361 and supplemental material.

He, P., D. Goethel, and T. Smith. 2007. Design and test of a topless shrimp trawl to reduce pelagic fish bycatch in the Gulf of Maine pink shrimp fishery. *J. Northw. Atl. Fish. Sci.*, 38:13–21.

Hendrickson, L. and Curti, K. 2011. Part I - Preliminary Analyses for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan. Report prepared for the FMAT. May 10, 2011.

Herring Alliance. 2009. "Out of Balance: Industrial Fishing and the Threat to Our Ocean." Accessed online November 7, 2011 http://www.herringalliance.org/resources

Holland, B.F., Jr., and G.F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. Division of Commercial and Sports Fisheries, North Carolina Dept. of Natural and Economic Resources, Special Scientific Report No. 24. 130pp.

Horwood, J. 2002. Sei whale, Balaenoptera borealis. In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 1069-1071.

Howell, W. H., and Langan, R. 1992. Discarding of commercial groundfish specie in the Gulf of Maine shrimp fishery. *North Am. J. Fish. Manage*. 12, 568-580.

ICCAT. 2010. Report of the 2010 Atlantic Bluefin Tuna Stock Assessment Session (Madrid, Spain—September 6-12, 2010).

International Whaling Commission (IWC). 2001. Report of the workshop on the comprehensive assessment of right whales: A worldwide comparison. Reports of the International Whaling Commission. Special Issue 2.

Island Fishermen's Wives Association. N.d. 2011. Web. http://www.ifwa.2ya.com/.

Island Institute. August 19, 2011. "About Us."; "Maine Islands Coalition." n.d. Web. http://www.islandinstitute.org/

James, M.C., R.A. Myers, and C.A. Ottenmeyer. 2005a. Behaviour of leatherback sea turtles, Dermochelys coriacea, during the migratory cycle. Proc. R. Soc. B, 272: 1547-1555.

Kanwit, J. K., and D. A. Libby. 2009. Seasonal movements of Atlantic herring (Clupea harengus):results from a four year tagging study conducted in the Gulf of Maine and Southern New England.J. Northw. Atl. Fish. Sci., 40: 29–39. doi:10.2960/J.v40.m577.

Katona, S.K., V. Rough, and D.T. Richardson. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution Press, Washington, D.C. 316pp.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginia's sea turtles: 1979-1986. Virginia J. Sci. 38(4): 329-336.

Kelly, K.H. and J.R. Moring. 1986. Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates - Atlantic herring. U.S. Fish Wildl. Serv. Biol. Rept. 82(11.38). TR EL-82-4. 22 pp.

Kenney, R.D. 2002. North Atlantic, North Pacific, and Southern hemisphere right whales. In: W.F.Perrin, B. Wursig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 806-813.

Kynard, B. and M. Horgan. 2002. Ontogenetic behavior and migration of Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus, and shortnose sturgeon, A. brevirostrum, with notes on social behavior. Environmental Behavior of Fishes 63: 137-150.

Laney, R.W., J.E. Hightower, B.R. Versak, M.F. Mangold, W.W. Cole Jr., and S.E. Winslow. 2007. Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988-2006. In Anadromous sturgeons: habitats, threats, and management (J. Munro, D. Hatin, J.E. Hightower, K. McKown, K.J. Sulak, A.W. Kahnle, and F. Caron (eds.)), p. 167-182. Am. Fish. Soc. Symp. 56, Bethesda, MD.Lessard, R. B. and M. D. Bryan. 2011. At-sea distribution and fishing impact on river herring and shad in the NW Atlantic. Unpublished manuscript. January 14, 2011

Leatherback Turtle Expert Working Group (TEWG). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555. 116 pp.Lohr, S. L. 1999. Sampling: Design and Analysis. Brooks/Cole Publishing Company: Pacific Grove, California.New England Fishery Management Council (NEFMC). 2011. Framework Adjustment 46 to the Northeast Multispecies FMP Working Draft, April 14, 2011.

Little Bay. August 19, 2011. "About Little Bay"; "The Freshest New England Lobsters Direct from the Boat to Your Door." N.d. Web. <http://www.littlebaylobster.com/>.

Lobster Institute. "Welcome to the Lobster Institute." n.d. Web. August 19, 2011. http://www.lobsterinstitute.org/.

Love, Norma. 2011. “NH proposed budget ends state’s shellfishing.” Deseret News. April 7, 2011. Web. <http://www.deseretnews.com/article/700125301/NH-proposed-budget-ends-states-shellfish-fishing.html >.

Mainebiz News Staff. November 15, 2010. “Linda Bean Buys Vinalhaven Wharf.” MaineBiz. Web. August 19, 2011. <http://www.mainebiz.biz/article.php?RF_ITEM[]=Article$0@47163;Article>

“Maine Fishermen’s Monument.” August 19, 2011. n.d. Web. http://www.mainefishermensmonument.org/

Maine Sea Grant Program. August 19, 2011. “Welcome to the Maine Sea Grant Program at the University of Maine”. N.d. Web.. http://www.seagrant.umaine.edu/

Maritime International, Inc. August 19, 2011. “Your East Coast Storage and Housing Connection Since 1893.” N.d. Web. http://www.maritimeinternational.org/index.htm

Massachusetts Fishermen’s Partnership. August 19, 2011. “Who We Are”. N.d. Web. < http://www.mass-fish.org/who.html >.

Maxner, E.E., G.D. Melvin, and M.J. Power. 2010. The 2009 German Bank Spawning Ground Tagging Turnover Rates. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/110: vi + 34 p.

ME DMR. “Maine Lobster Zone Councils.” 2011. Maine Department of Marine Resources. N.d. Web. http://www.maine.gov/dmr/council/lobsterzonecouncils/index.htm, 2011.

ME DMR. 2008. “Most Recent Maine Commercial Landings”. Maine Department of Marine Resources. N.d. Web. <http://www.maine.gov/dmr/commercialfishing/recentlandings.htm>.

ME DMR. 2006. “Knox County, Rockland/Thomaston Area, Maine Sportfishing Charter Boats. Maine Department of Maine Resources. Web. http://www.maine.gov/dmr/recreational/forhirefleet/knoxcounty.htm

ME DMR. 2006. “Hancock County, East Penobscot Bay / Deer Isle / Mount Desert Island Region, Maine Sportfishing Charter Boats. Maine Department of Maine Resources.

MLA. 2011. Maine Lobstermen’s Association Business Member Directory. N.d. Web. <http://www.mainelobstermen.org/directory.asp>.

Morreale, S.J. and E.A. Standora. 1998. Early life stage ecology of sea turtles in northeastern U.S. waters. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-413, 49 pp.

Morreale, S.J. and E.A. Standora. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp’s ridley and loggerhead sea turtles. Chel. Conserv. Biol. 4(4):872-882.Munroe, T.A. 2002. Herrings. Family Clupeidae. *In* B.B. Collette and G. Klein-MacPhee eds. Bigelow and Schroeder’s fishes of the Gulf of Maine. 3rd Edition. p. 111-160. Smithsonian Institution Press, Washington, DC. 748 p.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pp. 137-164 In: Lutz, P.L., and J.A. Musick, eds., The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Neilson, John, Alex Hanke and Stacey D. Paul. 2011. Spatial And Temporal Characteristics Of Recent Landings Of Western Atlantic bluefin Tuna In The Canadian Zone, In Relation To A Program Of Biological Sampling Proposed As Part Of The Grande bluefin Tuna Year Program. SCRS/2011/022. Accessed online November 8, 11. www.iccat.es/GBYP/Documents/.../SCRS-

11-022_Neilson_et_al.pdf Cieri, M. 2011. 2010 estimate of rive herring catch. Prepared for the DEIS for NEFMC Herring FMP A5.

National Research Council (NRC). 1990. Decline of the Sea Turtles: Causes and Prevention. Committee on Sea Turtle Conservation. Natl. Academy Press, Washington, D.C. 259 pp.New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council and National Marine Fisheries Service. 2007. Northeast Region Standardized Bycatch Reporting Methodology: An Omnibus Amendment to the Fishery Management Plans of the New England and Mid-Atlantic Fishery Management Councils. June 2007. 642p

New Bedford Area Visitor Guide. August 19, 2011."Fishing Charters." N.d. Web.

New England Fishery Management Council (NEFMC). 1999. Final Atlantic herring fishery management plan. Incorporating the environmental impact statement and regulatory impact review. Volume I. NEFMC in consultation with the ASMFC, MAFMC, and NMFS. Final document submitted March 8, 1999.

New England Fishery Management Council (NEFMC). 1998. Final Amendment #11 to the Northeast Multispecies Fishery Management Plan, #9 to the Atlantic Sea Scallop Fishery Management Plan, Amendment #1 to the Monkfish Fishery Management Plan, Amendment #1 to the Atlantic Salmon Fishery Management Plan, and components of the proposed Atlantic Herring Fishery Management Plan for Essential Fish Habitat, incorporating the environmental assessment. October 7, 1998.

New Hampshire Department of Environmental Services. August 19, 2011. "New Hampshire Coastal Program Online Directory". N.d. Web. http://des.nh.gov/organization/divisions/water/wmb/coastal/resources/commercial_industrial.htm

NMFS and U.S. Fish and Wildlife Service (USFWS). 1991a. Recovery plan for U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.

NMFS and USFWS. 1991b. Recovery plan for U.S. population of Atlantic green turtle. National Marine Fisheries Service, Washington, D.C. 58 pp.

NMFS and USFWS. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, MD. 139 pp.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007a. Loggerhead sea turtle (/Caretta caretta/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 65 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007b. Leatherback sea turtle (/Dermochelys coriacea/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 79 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007c. Kemp's ridley sea turtle/ (Lepidochelys/ /kempii/) 5 year review: summary and evaluation.

National Marine Fisheries Service, Silver Spring, Maryland. 50 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2007d. Green sea turtle (/Chelonia mydas/) 5 year review: summary and evaluation. National Marine Fisheries Service, Silver Spring, Maryland. 102 pp. Available at: http://www.nmfs.noaa.gov/pr/listing/reviews.htm.

National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). 2008. Recovery plan for the Northwest Atlantic population of the loggerhead sea turtle (Caretta caretta), second revision. National Marine Fisheries Service, Silver Spring, Maryland.

NMFS. 1998. Recovery Plan for the blue whale (Balaenoptera musculus). Prepared by R.R. Reeves, P.J. Clapham, R.L. Brownell, Jr., and G.K. Silber for the National Marine Fisheries Service, Silver Spring, MD. 42pp.NMFS. 2005. Recovery Plan for the North Atlantic right whale (Eubalaena glacialis). National Marine Fisheries Service, Silver Spring, MD. 137pp.

NMFS (National Marine Fisheries Service). 1991a. Final recovery plan for the North Atlantic right whale (Eubalaena glacialis). Prepared by the Right Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 86 pp.

NMFS. 1991. Final recovery plan for the humpback whale (Megaptera novaeangliae). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

NMFS (National Marine Fisheries Service). 2007. Final Environmental Impact Statement for amending the Atlantic Large Whale Take Reduction Plan: broad-based gear modifications. Volume I of II.O'Connor, S., Campbell, R., Cortez, H., and Knowles, T. 2009. Whale Watching Worldwide: tourism numbers, expenditures and expanding economic benefits, a special report from the International Fund for Animal Welfare, Yarmouth MA, USA, prepared by Economists at Large.

NOAA Fisheries. 2012. 54th Northeast Regional Stock Assessment Workshop (54th SAW) Assessment Report. U.S. DOC, NEFSC Ref. Doc. 12-18: 600 pp.

NOAA Fisheries. 2003. "Fisheries of the United States—2002." NOAA Fisheries Office of Science and Technology. Web. http://www.st.nmfs.noaa.gov/st1/fus/fus09/index.html

NOAA Fisheries. 2010. "Fisheries of the United States—2009." NOAA Fisheries Office of Science and Technology. September 3, 2010. Web. http://www.st.nmfs.noaa.gov/st1/fus/fus09/index.html

O'Keefe C. E., DeCelles G., Georgianna D., Stokesbury K. D. E. and Cadrin S. X. 2010. Confronting the bycatch issue: An incentive-led approach to maximizing yield in the US sea scallop fishery. ICES CM; September 20-24; Nantes,France. 4 pp.

Overholtz, W.J. & Link, J.S. (2007). Consumption impacts by marine mammals, fish, and seabirds on the Gulf of Maine-Georges Bank Atlantic Herring (Clupea harengus) complex during 1977-2002. ICES J. Mar. Sci. 64:83-96.

Overholtz, W. J. and A. V. Tyler (1985). "Long-term responses of the demersal fish assemblages of Georges Bank." Fishery Bulletin 83(4): 507-520.

Palmer, M. C. and S. E. Wigley. 2007. Validating the stock apportionment of commercial fisheries landings using positional data from Vessel Monitoring Systems (VMS). US Department of Commerce, Northeast Fish Science Center Reference Document 07-22, 35 pp.

Penobscot East Resource Center. August 19, 2011. "About Us."; "Collaborators and Partners" n.d. Web. <http://www.penobscoteast.org/about.asp>

Pew Environmental Group. 2008. Out of Balance: Industrial Fishing and the Threat to Our Ocean. May 21, 2008. Accessed online October 28, 2011. http://www.pewtrusts.org/our_work_report_detail.aspx?id=39592

Portland Fish Exchange. October 11, 2011. "About the Auction." n.d. Web. <http://www.pfex.org/about/auction.htm>

Portsmouthnh.com. August 19, 2011. "Excursion Boats: Deep-Sea Fishing". n.d. Web. http://www.portsmouthnh.com/port/boats.cfm

Pratt, S. (1973). Benthic fauna. In: Coastal and offshore environmental inventory, Cape Hatteras to Nantucket Shoals. Univ R.I. Mar. Pub. Ser.

Patrician, M. R., Biedron, I. S., Esch, H. C., Wenzel, F. W., Cooper, L. A., Hamilton, P. K., Glass, A. H. and Baumgartner, M. F. 2009. Evidence of a North Atlantic right whale calf (Eubalaena glacialis) born in northeastern U.S. waters. Marine Mammal Science, 25: 462–477.

Perrin, W.F., B. Wursig, and J.G.M. Thewissen (eds.). 2002. Encyclopedia of Marine Mammals. Academic Press, CA.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Mar. Fish. Rev. Special Edition. 61(1): 59-74.Reid, R.N., L. M. Cargnelli, S. J. Griesbach, D. B. Packer, D.L. Johnson, C.A. Zetlin, W.W. Morse, and P.L. Berrien. 1999. Essential Fish Habitat Source Document: Atlantic Herring, *Clupea harengus* L., Life History and Habitat Characteristics. NMFS, Highlands, NJ.

RI DEM. 2003. Current Boat Listings By Location. Department of Environmental Management. 12/01/03.

Richards, A. and L. Hendrickson. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine Northern shrimp fishery. *Fisheries Research* 81: 100-106.

Rhode Island Fishermen's Alliance. August 19, 2011. "Home". N.d. Web. http://www.rifishermensalliance.com/

Rhode Island Lobstermen's Association. August 19, 2011. "Home." N.d. Web. http://www.rilobstermen.com/

Rhode Island Marine Trades Association. "Welcome to RIMTA". Nd. Web. http://www.rimta.org/

Rhode Island Saltwater Anglers. August 19, 2011. "Representing over 6,500 Anglers". N.d. Web. http://www.risaa.org/

Rhode Island Science & Technology Advisory Council. August 19, 2011. "About RI STAC". N.d. Web. http://stac.ri.gov/about/

Rhode Island Sea Grant. August 19, 2011. “Coastal Communities, Rhode Island Ports & Harbors Inventory”. N.d. Web. http://seagrant.gso.uri.edu/coast/portsharbors.html

Ruais, Rich. 2006. Herring Midwater Trawl Madness. CHOIR COALITION Press Release, November 5. Accessed online October 28, 2011. http://www.comminternet.com/websites/choircoalition.org/media/detail.php?id=28

Schmitt, Kathleen. 2002. “UNH Helping Portsmouth fisherman’s Cooperative Survive and Evolve. October 10, 2002. Web. <http://www.unh.edu/news/archive/2002/october/ks_20021010fishcoop.html>.

Sears, R. 2002. Blue Whale, Balaenoptera musculus. - In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp.112-116.

Saving Seafood. August 19, 2011. “About Us.” N.d. Web. < http://www.savingseafood.org/about-us.html>.

Seelye, Katharine. In Maine, Last Sardine Cannery In The U.S. Is Clattering Out. New York Times, April 4, 2010. Available on June 25, 2011at http://www.nytimes.com/2010/04/04/us/04cannery.html

Shepherd, G., M. Cieri, and W. Overholtz. 2009. Transboundary Resources Assessment Committee Gulf of Maine/George’s Bank Atlantic herring stock assessment update. Transboundary Resources Assessment Committee Reference Document 2009/04.

Sherman, K., N. A. Jaworski, et al. (1996). The northeast shelf ecosystem - assessment, sustainablity, and management. Cambridge, MA, Blackwell Science.

Shoop, C.R. and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetol. Monogr. 6: 43-67.Steimle, F. W. and C. Zetlin (2000). "Reef Habitats in the Middle Atlantic Bight: Abundance, Distribution, Associated Biological Communities, and Fishery Resource Use." Marine Fisheries Review 62(2): 24-42.

Smedbol, R.K and R. Stephenson. 2001. The importance of managing within-species diversity in cod and herring fisheries of the north-western Atlantic in Journal of fish Biology 49 (Supplement A): 109-128

Stein, A. B., K. D. Friedland, and M. Sutherland. 2004a. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. North American Journal of Fisheries Management 24: 171-183.

Stein, A.B., K. D. Friedland, and M. Sutherland. 2004b. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. Transaction of the American Fisheries Society 133:527-537.

Stevenson, D., L. Chiarella, et al. (2004). Characterization of fishing practices and marine benthic ecosystems of the northeast US shelf, and and evaluation of potential effects of fishing on Essential Fish Habitat. National Marine Fisheries Service NOAA Technical Memorandum. Gloucester, MA. NMFS-NEFSC 181: 179.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. Mar. Mamm. Sci. 9: 309-315.

The Gloucester Fishermen's Wives Association. August 19, 2011. "Once a Vision, Now a Reality". N.d. Web. < http://www.gfwa.org/memorial/memorial.html>.

The Recreational Fishing Alliance. August 19, 2011. "About the RFA". N.d. Web. http://www.joinrfa.org/About_Us.htm.

The School of Marine Sciences. "Welcome." n.d. Web. August 19, 2011. http://www.umaine.edu/marine/.

Theroux, R. B. and R. L. Wigley (1998). Quantitative Composition and Distribution of the Macrobenthic Invertebrate Fauna of the Continental Shelf Ecosystems of the Northeastern United States. NOAA Technical Report NMFS 140**:** 240p.

Theroux, R. B. and M. D. Grosslein (1987). Benthic fauna. Georges Bank. R. H. Backus and D. W. Bourne. Cambridge, MA, MIT Press**:** 283-295.

Thornton, Thomas F., Madonna L. Moss, Virginia L. Butler, Jamie Hebert and Fritz Funk. 2010. Local and Traditional Knowledge and the Historical Ecology of Pacific Herring in Alaska. Journal of Ecological Ecology 14(1):81-88. Thornton, Thomas F., Madonna L. Moss, Virginia L. Butler, Jamie Hebert and Fritz Funk. 2010. Local and Traditional Knowledge and the Historical Ecology of Pacific Herring in Alaska. *Journal of Ecological Ecology* 14(1):81-88.

TRAC. 2009. Status Report for Atlantic Herring Stock Complex.

TRAC. 2006. Report of the meeting held May 2006. Transboundary Resource Assessment Committee. Woods Hole, MA.

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp's ridley (Lepidochelys kempii) and loggerhead (Caretta caretta) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

Turtle Expert Working Group (TEWG). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC-444, 115 pp.

Turtle Expert Working Group (TEWG). 2009. An assessment of the loggerhead turtle population in the northwestern Atlantic Ocean. NOAA Technical Memorandum NMFSSEFSC-575.

U.S. Census. 2010. "American Fact Finder." Web. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_DP_DPDP1&prodType=table

Valentine, P.C. and R.G. Lough (1991). The sea floor environment and the fishery of eastern Georges Bank. U.S. Dep. Inter., U.S. Geol. Surv. Open File Rep. 91-439, 25 p.

Vinalhaven Fisherman's Co-op. August 19, 2011. "Vinalhaven Fisherman's Co-op Located on the island of Vinalhaven, Maine". N.d. Web. <http://vinalhavencoop.com/>

Waldman, J. R., J. T. Hart, and I. I. Wirgin. 1996. Stock composition of the New York Bight Atlantic sturgeon fishery based on analysis of mitochondrial DNA. Transactions of the American Fisheries Society 125: 364-371.

Waltling, L. (1998). Benthic fauna of soft substrates in the Gulf of Maine. In: Dorsey, E.M.; Pederson, J. eds. Effects of fishing gear on the seafloor of New England. MIT SeaGrant Pub. 98-4: 20-29.

Waring, G.T., D.L. Palka, P.J. Clapham, S. Swartz, M. Rossman, T. Cole, L.J. Hansen, K.D. Bisack, K. Mullin, R.S. Wells, D.K. Odell, and N.B. Barros. 1999. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 1999. NOAA Technical Memorandum NMFS-NE-153.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley, Editors. 2006. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2005. NOAA Tech. Memo. NMFS-NE-194, 352pp.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley, Editors. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2006. NOAA Tech. Memo. NMFS-NE-201, 378 pp.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley, Editors. 2008. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments-2007. Available at: http://www.nmfs.noaa.gov/pr/sars.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley, eds. 2010. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2009. Available at: http://www.nmfs.noaa.gov/pr/sars.

Whitehead, H. 2002. "Sperm whale Physeter macrocephalus". In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen (eds.), Encyclopedia of Marine Mammals. Academic Press, CA. pp. 1165-1172.

Wigley, S. E.., Blaylock, J., and P. J. Rago. 2009. River Herring Discard Estimation, Precision and Sample Size Analysis. US Dept Commerce, Northeast Fish Science Center Reference Document 09-20; 15 pp.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, Megaptera novaengliae, in the mid-Atlantic and southeast United States, 1985-1992. Fish. Bull., U.S. 93:196-205.

Yankee Fisherman's Cooperative. August 19, 2010. "About Us". Web. http://www.yankeefish.com/about-us

Zinkevich, V.N. 1967. Observations on the distribution of herring, *Clupea harengus* L., on Georges Bank and in adjacent waters in 1962-65. ICNAF Res. Bull. No. 4, pp. 101-115.

VOLUME II

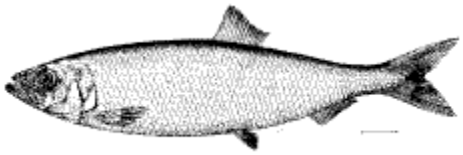
AMENDMENT 5

to the

Fishery Management Plan (FMP)

for

Atlantic Herring



APPENDICES

Prepared by the

New England Fishery Management Council

in consultation with

National Marine Fisheries Service

Atlantic States Marine Fisheries Commission

Mid-Atlantic Fishery Management Council

Date Submitted (NEFMC Final): March 25, 2013

Intentionally Blank

Appendix I
Discussion Paper:
Potential Applicability of Flow Scales, Hopper Scales, Truck Scales and Volumetric Measurement in the Atlantic Herring Fishery

Prepared by Council Staff for the Herring Committee July 2010

Amendment 5 Draft EIS
Fall 2011

Table of Contents

1.0 Fishing Vessel Equipment and Procedure 3
1.1 Harvesting 3
1.2 Offloading 7
1.3 Equipment 14
2.0 Processing Facilities 15
3.0 Flow Scales 22
3.1 Description 22
3.2 Cost 23
3.3 Maintenance 23
3.4 Experiences 24
4.0 Hopper Scales 24
4.1 Description 24
4.2 Cost 26
4.3 Maintenance 26
5.0 Truck Scales 27
5.1 Fixed Truck Scales 27
5.2 Existing Truck Scales 28
5.3 Portable Truck Scales 34
5.3.1 Large Portable Scales 34
5.3.2 Wheel Pads 34
5.3.3 Axle Pads 35
5.4 Accounting for Ice and Water 35
6.0 Certified Volumetric Estimates 36
6.1 Sealing and Measurements 36
6.2 Volumetric Unit Conversion 37
7.0 Regulations Requiring Weighing of Fish or Volumetric Measurement 38
7.1 State of Maine 38
7.2 Fisheries of the Exclusive Economic Zone Off Alaska 38
7.3 Europe 39
7.4 Canada 39
8.0 Summary 40
9.0 Appendix A 45
10.0 Appendix B 49

1.0 FISHING VESSEL EQUIPMENT AND PROCEDURE

The following information was collected via personal communication with several helpful industry members.

1.1 HARVESTING

On a typical herring boat the net is brought alongside the boat and a vacuum pump is lowered into the net to draw the fish out of the net and onto the boat. The catch enters the boat through a “bell” (Figure 1) and are pumped through a series of tubes and pipes (Figure 2).



Figure 1. A bell, the beginning of the pumping process on a herring vessel



Figure 2. Example of tubing used for pumping fish

The catch is first drawn across a de-watering box (Figure 3, Figure 4) where some of the water that the pump brought on board with the fish is removed. If there are a number of particularly small fish in the catch then the de-watering box mesh may get clogged, and the efficiency of water removal decreases (Figure 5). From the dewatering box a series of metal chutes are employed which can be blocked off in differing areas to force the catch

in different directions (Figure 3, Figure 6), in order to channel the catch to different holding tanks (Figure 7).

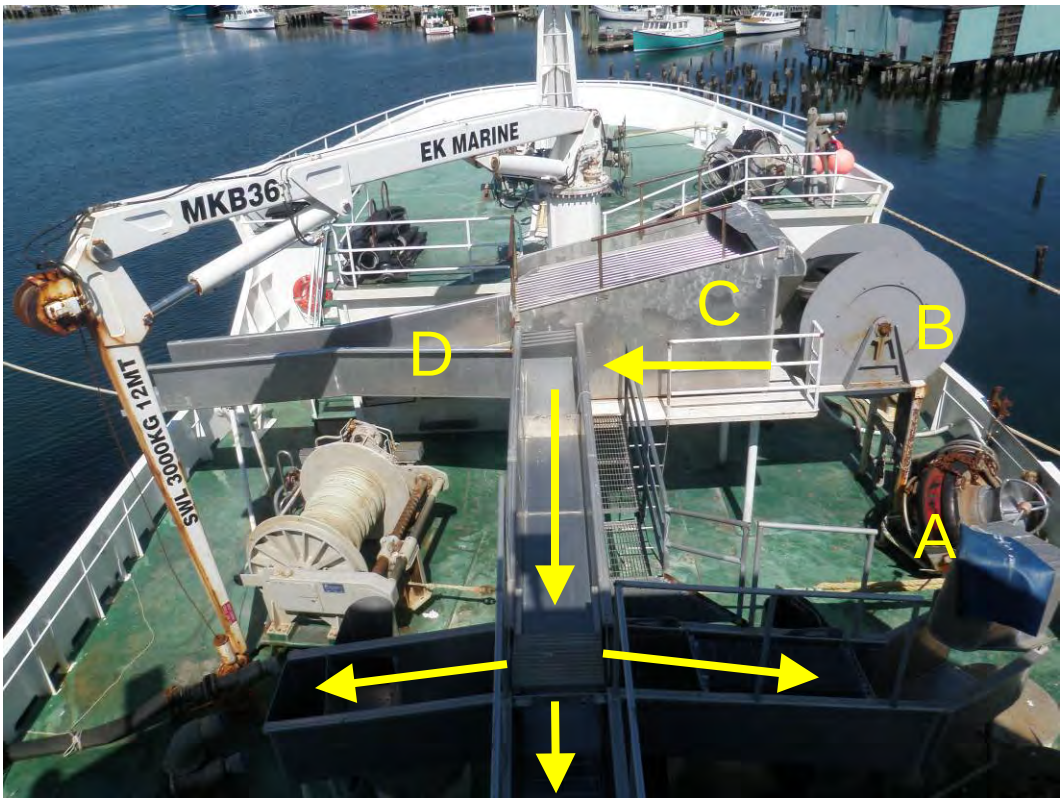


Figure 3. One vessel's system for pumping fish, where fish would move from the bell (A), through the extendable tubing (B) to the de-watering box (C) and through a series of metal chutes to various holding tanks. The arrows demonstrate the movement of fish, while the chute marked (D) channelizes the removed water off the boat



Figure 4. A De-watering box on another vessel, from the front

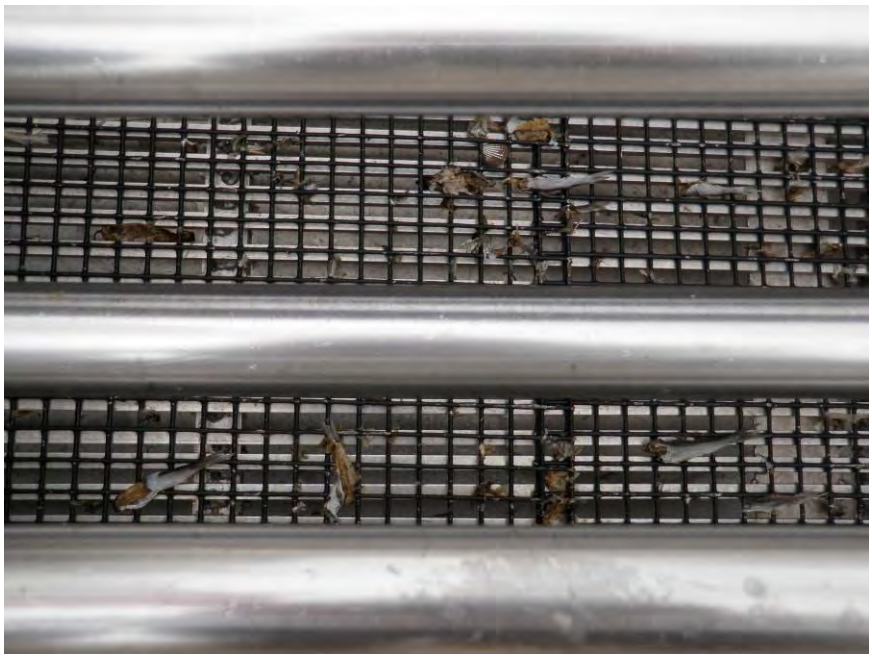


Figure 5. Detail of the lower half of a de-watering box, demonstrating how small marine life and detritus can catch and clog on the mesh

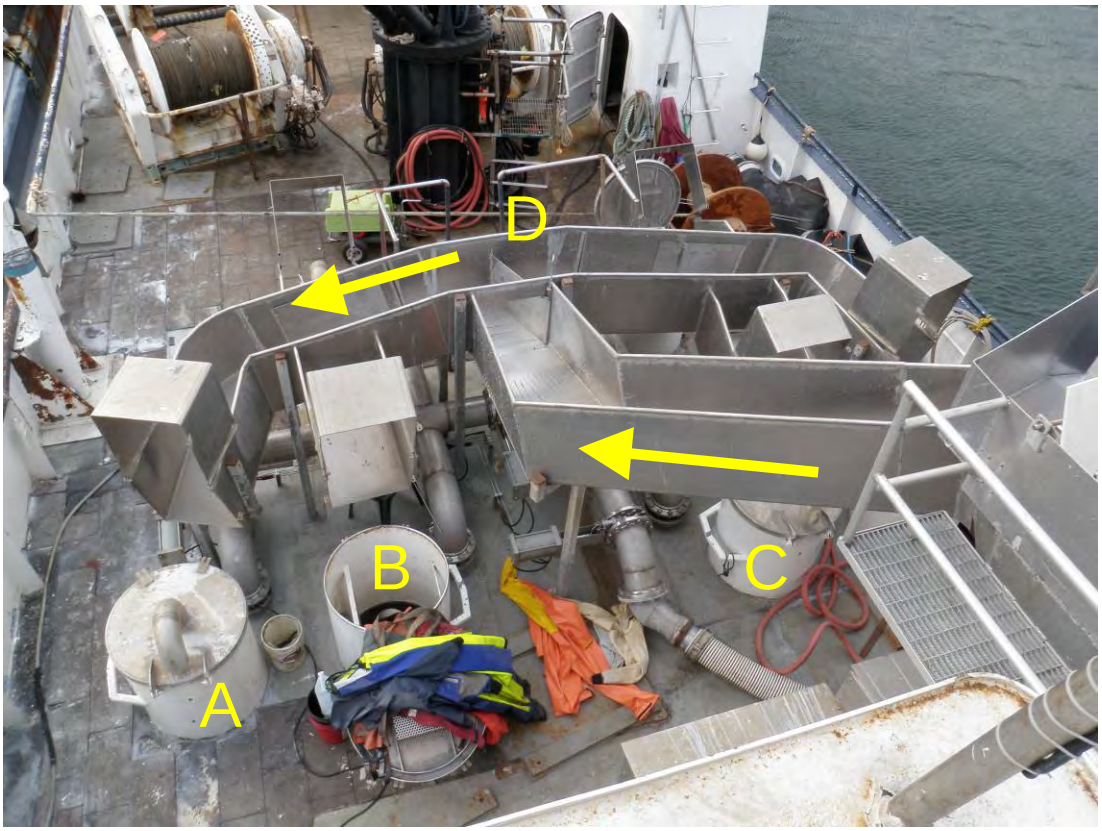


Figure 6. A different boat's metal chutes, used to channelize the fish to the different holds (A, B, C), with one side closed off (D)



Figure 7. Detail of channelization (A) into the holding tank (B)

Once in the holding tank cold water is employed to keep the fish fresh (Figure 8, Figure 9). Some boats will dewater the tank out at sea to get rid of the enzymes from the herring's stomachs and re-fill the holding tank with fresh water. The enzymes can build up in warm water and cause the fish to decompose and potentially lose their skin.



Figure 8. A holding tank, empty



Figure 9. A full holding tank, with fish and water

1.2 OFFLOADING

Once the boat docks, the fish are pumped back out of the hold onto shore; in some ports a pump which is separate from the vessel, typically located on the dock, is employed to move the fish off of the vessel (Figure 10) and in other ports the vessel has to reverse the boat pump. During offloading a series of tubes and pipes are employed to move the fish (Figure 11). This process varies with different boats and different ports, but in most cases the fish run back over another de-water box and out to fill up either containers or trucks (Figure 11, Figure 12, and Figure 13).



Figure 10. This pump, situated on a dock, is used to move the herring from the boat and into the de-watering box and eventually a truck or container, situated portside.



Figure 11. When a boat offloads at this port the herring move in the pipes, some 20 feet off the ground (yellow arrow), into the dewatering box (A) and then into a truck (not pictured).

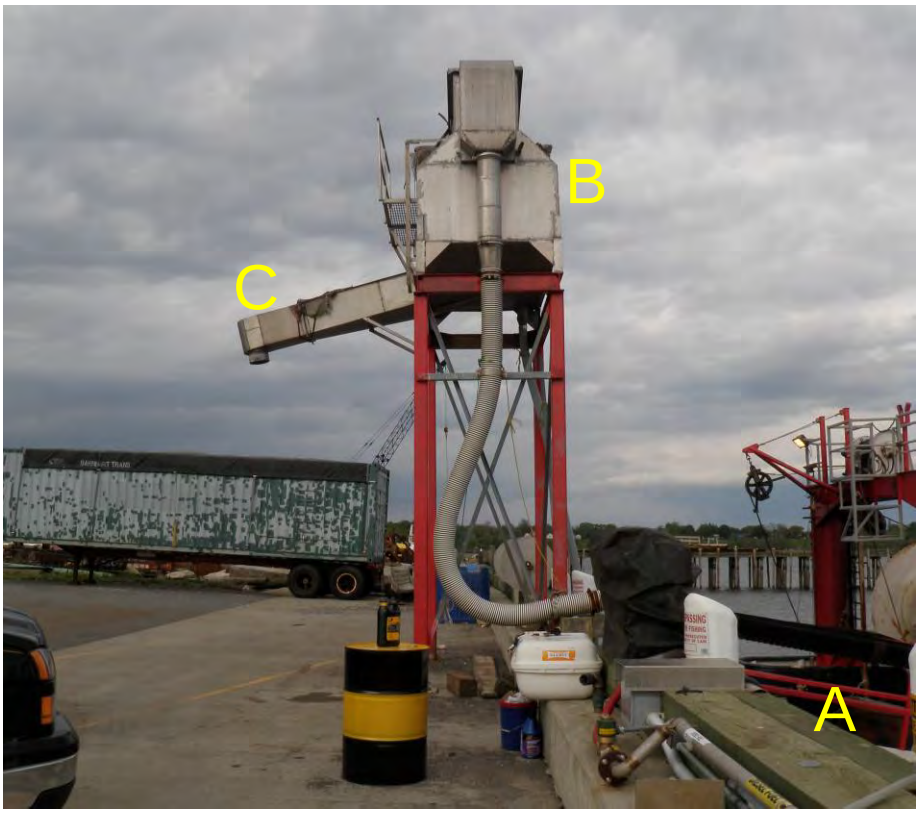


Figure 12. At this port herring are unloaded from the vessel, into tubes on the dock (A), up through another tube and into a dewatering box (B). Trucks drive under the end of the dewatering box (C) and fish are dumped into containers or the truck itself (not pictured).

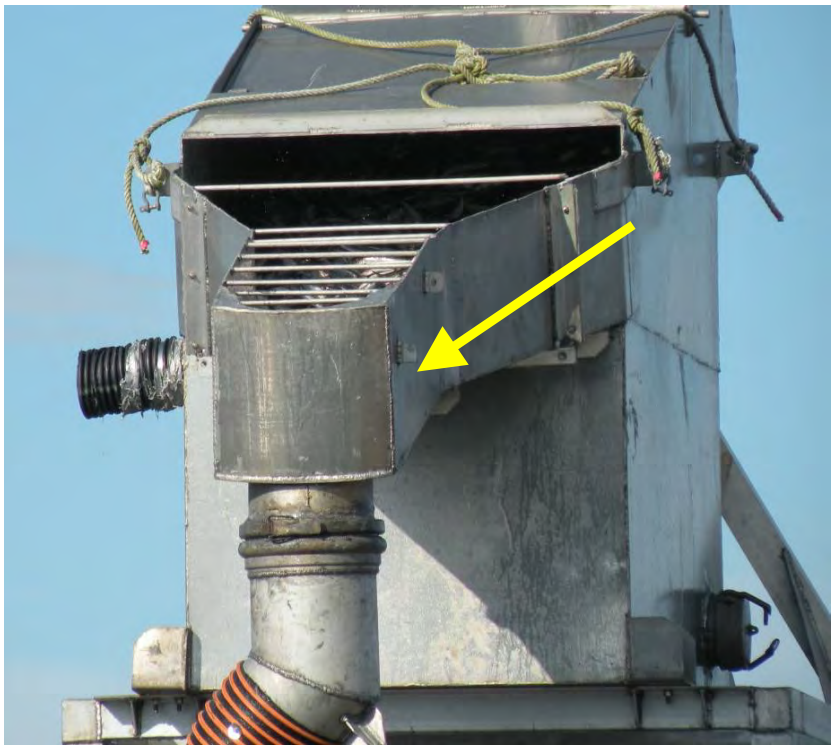


Figure 13. A de-watering box with fish on their way to the truck

The containers and trucks vary in size and dimensions that depend on the buyer, location, and time of year(Figure 14 and Figure 15). Truck sizes can range from 18 wheel trucks to box trucks, and containers can vary from bags to large bait containers (Figure 16). Some extended, 22 wheel trucks may also be employed to carry the herring.



Figure 14. Trucks picking up herring in Portland, ME clog the streets as they wait to be filled.



Figure 15. A flatbed truck carrying bait containers as it is being filled from the de-watering box. A man holds a tube in place to direct the flow of herring.



Figure 16. Bait containers wait to be filled on the side of the dock.

Although the de-watering box gets rid of some water, this process in not very thorough and some of the water stays with the fish (Figure 17 and Figure 18). Some trucks will pull aside, allow the water to flow out of the truck and the fish to settle, and then will come back to be filled further (Figure 19 and Figure 20). With current regulations most boats can only land their fish two days out of the week, and therefore the scene at the dock can be crowded and hectic during those days, and deserted on other days (Figure 21 and Figure 14).

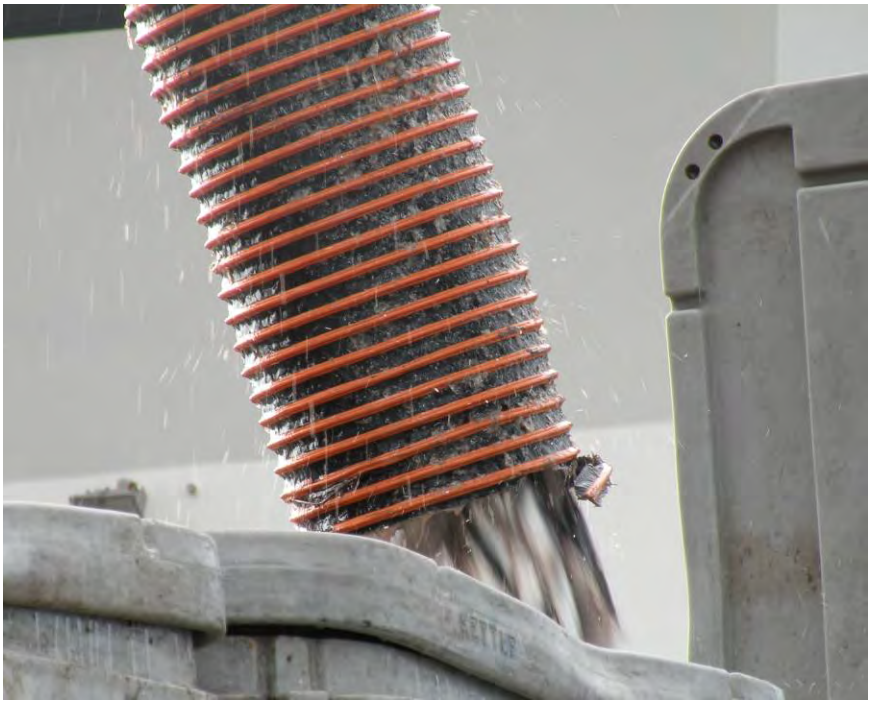


Figure 17. Herring and water are pumped into a bait container



Figure 18. Filled bait containers to the point of overflowing.



Figure 19. A bait truck waits to de-water after the truck is filled with herring.



Figure 20. The amount of water discharged from a bait truck after being filled with herring for only a few minutes.



Figure 21. Trucks line up down the road, all waiting to be filled with herring.

Ice is occasionally employed for keeping fish cool within a truck; however the cold water systems on the vessels maintain temperatures for long enough to ensure the quality of fish for bait purposes. If the herring are for human consumption, ice will likely be used. The filled trucks can be destined for many locations from down the street to several states away. Buyers of herring differ based on the seasons, and therefore so do the destinations.

Payment is typically received after the fish arrives at a destination, when the two parties will agree on how many pounds of fish were received. The number of pounds purchased may be agreed upon based on assumed volumes, which come from the container or truck used, and herring are not often weighed. A typical assumption used by captains and buyers is that 5% of the estimated volume of fish once in the containers is comprised of only water.

1.3 EQUIPMENT

Although the sizes of the vessels and the holding tanks therein differ, the size of hose or pipe used is relatively standard. Similarly, the de-watering boxes tend to be the same on the vessels, although on land they come in much larger sizes.

Vessel	Pump Company	Pump Rate (tons/hour)	Extreme Rates	# Pumps
1	Ryco	100	150	2
2	Trans Vac	50	60	1
3	Trans Vac	60	70	1
4	Ryco	60	70	1
5	Combo/self made	72	-	1

Table 1. Visited vessels pump specifications. Pump rates vary, and depend on the incline of the pipe or tube used; the steeper the incline the slower the pumping. Likewise, size of the fish will change the rate of the pump. Both the FV Sunlight and FV Starlight have pumps which reverse, meaning the pump will suck for 15 to 20 seconds and then discharge for 20 to 30 seconds.

Vessel	Size of Boat	Size of Pipes	Inflow	Outflow	Dewater Box	No. of Tanks	Size of tanks (each)
1	164' 10.5"	10"	16"	10"	-	10	between 100,000 + 240,000 pounds
2	-	8"	8"	8"	4'x6'	4	50,000 pounds
3	129'	8"	8"	12"	4'x6'	6	between 75,00 and 100,000
4	95'	8"	8"	12"	4'x6'	6	between 35,000 and 45,000
5	112'	8"	8"	12"	5'x5'	4	22 cubic feet

Table 2. On-board equipment by visited vessel.

	Ports Typcially Utilized			
	Osprey and Western Venture	Ruth and Pat	Starlight and Sunlight	Providian
Portland ME	x	x	x	x
Rockland ME	x	x	x	
Stonington MA				
Vinalhaven ME			x	
Cundy's Harbor		x		
Lubec/Eastport ME				
Prospect Harbor ME	x			
Bath ME				
Sebasco Estates ME				
Newington				
Portsmouth				
Hampton/Seabrook				
Gloucester MA	x		x	
New Bedford MA	x	x	x	
Fall River		x	x	x
Point Judith				
Newport				
North Kingstown				
Cape May NJ		x		

Table 3. Estimated frequently visited ports, by vessel, compared to Amendment 1 to the Herring FMP's "Communities of Interest"

2.0 PROCESSING FACILITIES

The portside offloading at processing facilities begins in the same way that direct offloading to trucks does, with large quantities of product moving off the ship via tubes and a portside pump (Figure 22). The herring are pumped up and over a de-watering box but prior to dropping into the truck or container, are moved along a short conveyor belt. This belt allows even more water to be drained from the fish (Figure 23). If the herring are to enter the processing facility rather than a truck or container, the herring are pumped from the dewatering box into the facility (Figure 24).



Figure 22. A dockside pump utilized for removing fish from the hold and into the processing facility.



Figure 23. The herring, after pumped off the boat and to the de-watering box (A) are then are either deposited into trucks or poultry bins via a hose for bait sales (B) or into the facility via a conveyor belt (C) and then into tubes into the plant for the food market. Meanwhile cold water is re-circulated between the boat and the storage tank (D) via pipes (E).



Figure 24. Transportation pipes and hoses entering the processing facility after coming from the dock.

Once in the facility the fish are stored in a holding tank until they are moved into the sorting process via a conveyor belt (Figure 25). The machines sort the herring into either four or five different sizes, and the bycatch also drops out (Figure 26). Once sorted, the herring are moved into one of three rooms, depending on their size.

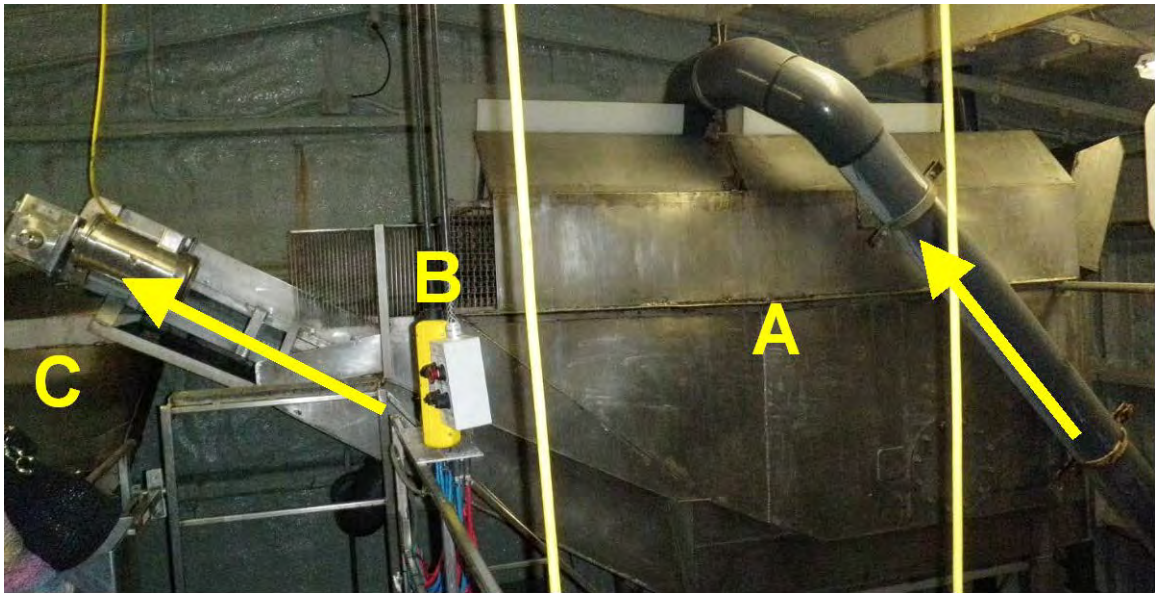


Figure 25. One of the holding tanks used in the process (A) with the controls for all the pumps which move the fish into the facility (B) and the conveyor belt (H) which begins the sorting process.

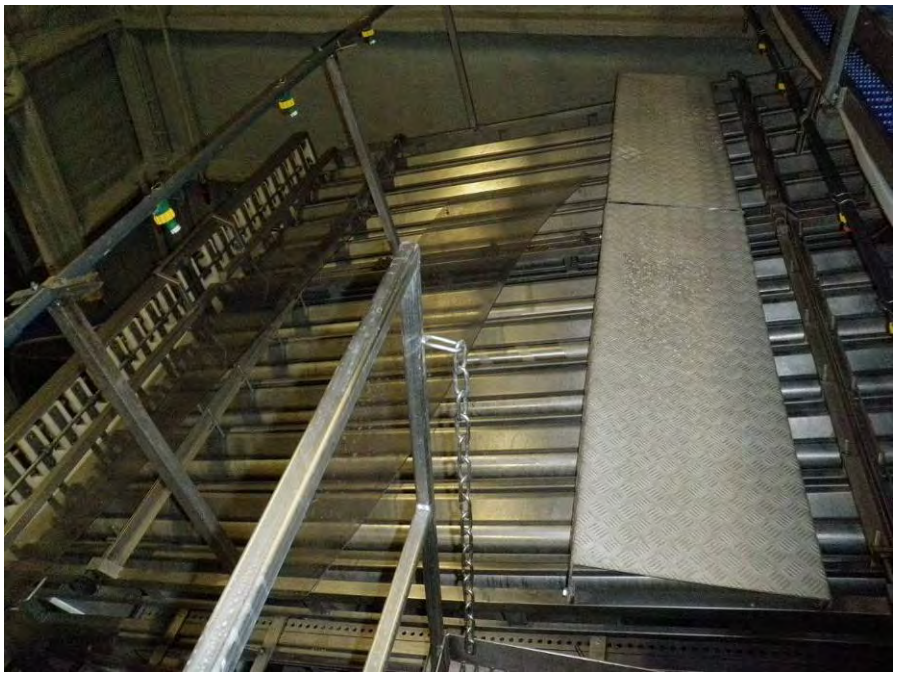


Figure 26. A sorting machine in which different sized herring fall to different levels depending on their ability to fit though the bars.

In each room, upon entering, the herring are manually sorted in order to remove bycatch, and then conveyed into a holding tank. From the holding tank the fish are conveyed into a hopper system, which has two scales within it to parse the fish by a specified weight for packaging (Figure 27 and Figure 28). The packaging, which is done manually, consists of dropping the fish into a plastic bag, which is then placed inside of a box (Figure 29). The first room contains four of these hopper systems which operate at six tons an hour, average.

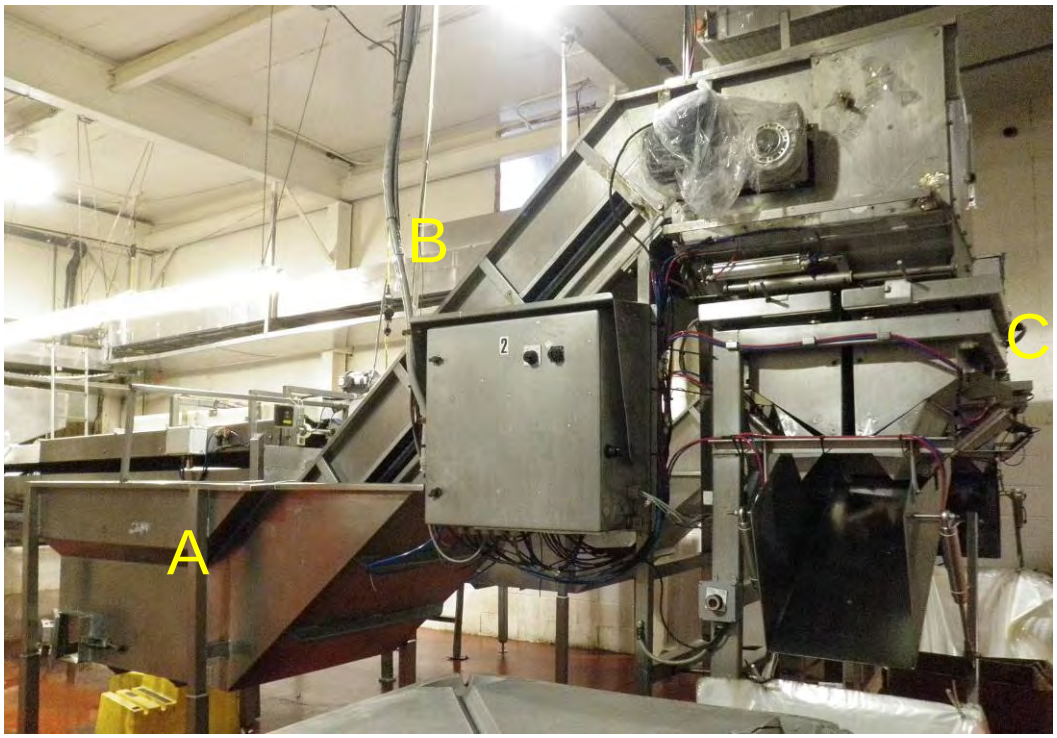


Figure 27. A full hopper system with a small holding area (A), a conveyor (B) and a two hoppers (C).



Figure 28. The dual conveyor belt picks up fish in small and large increments, to be used to fill the hoppers to the desired weight for packagaing.

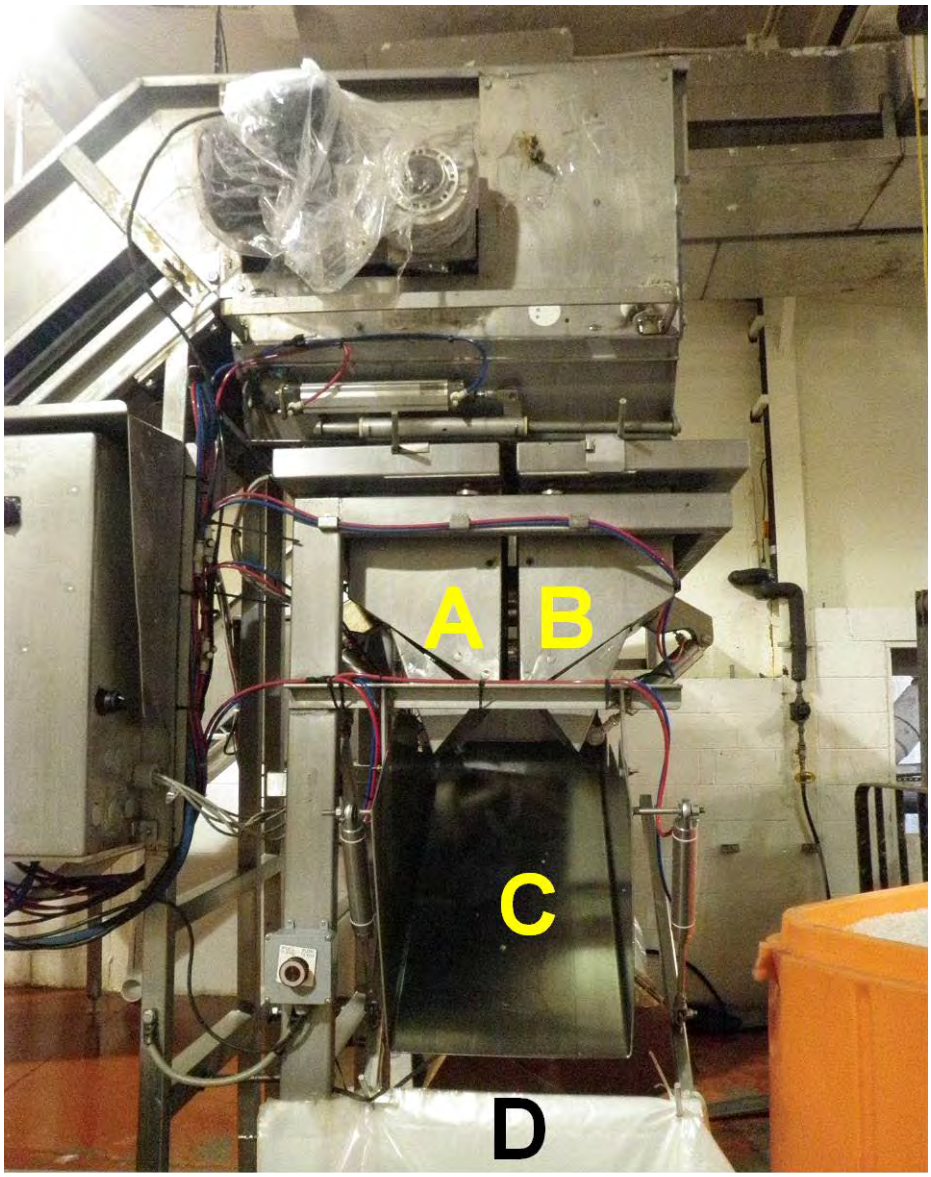


Figure 29. Each of the two hoppers pictured here (A and B) has an electronic scale to verify the total weight of the fish. As one hopper opens to drop the fish down the chute (C) and into the packaging (D), the other hopper is being filled and the contents weighed and later opens as the first hopper begins to fill again.

In the second room, however, there is a processing line which does not contain any machine, and all sorting and packaging is done manually, using standing scales. In the third room there is a processing line in which even the packaging is done by machine (Figure 30). Both of these rooms also contain hopper systems (one in the second, three in the third), and each line is used depending on the size of the fish and the amount of fish being brought into the facility.

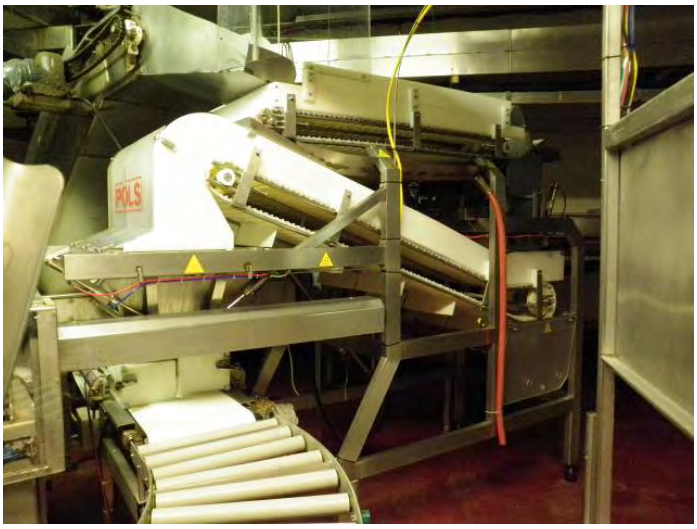


Figure 30. The completely computerized packaging system, which is utilized after the hopper system.

There is an advantage to having each box weigh as close to the desired weight as possible. After the boxes are taped up they are either loaded into a freezer to sell later (Figure 31) or shipped out immediately. In either case, the shipping costs are based on the weight of the boxes, and therefore it is in the interest of the seller to keep the weight to a specified measure, such as 20 kilos.



Figure 31. Boxes of fish stacked floor to ceiling in the freezer, waiting for shipping.

The previous discussion was based on a site visit to Lund's Fisheries, Inc, which can process around 480 tons of herring a day and utilizes seven 2,500 horsepower engines in order to chill the product. The two other major processing plants involved in the herring fishery, NORPEL and Cape Seafoods, are assumed to be similar in operation for the sake of furthering management measures. Cape Seafoods is reported to have two scales on

each of four processing lines as well as one scale on each of the other two processing lines. It should also be acknowledged, however, that Lund's operates within the food market and may therefore operate with differing equipment and under different standards.

3.0 FLOW SCALES

Three scale companies were approved by the NMFS Alaskan Regional Office (ARO) for their at-sea scales: Scanvaegt, Pols, and Marel. Approximately 6 years ago Pols was bought by Marel, and then approximately 3 years ago Scanvaegt was also bought by Marel. Since then the personnel at the ARO have been working with the people of Marel to continue to maintain and certify the at sea scales. The only other company that produces marine scale of the flow and hopper variety in the US is Ryko.

In both flow scales and hopper scales a computer monitoring system comes included. Both companies (Marel and Ryko) extol the wonders of having computer systems helping to control production and monitor data. Marel claims that the speed of the pumps can be controlled by the computer and that the monitoring benefits will aid in optimizing the system by pointing out the strengths and weaknesses of the fish processing on board or portside.

Certification of both types of scales is typically conducted by either the NMFS personnel or the state Department of Weights and Measures.

3.1 DESCRIPTION



Photo Credit: Marel

Flow scales are used in conveyor systems where there is a continuous flow of material, such as herring. It is typically equipped with a weight sensor that the fish pass over as they move down the conveyor belt. The computer attached to the sensors weighs the fish

continuously and the resulting weight is a total of those measurements. The representative for Ryko highly recommended that a de-watering conveyor be set up before the flow scale rather than a de-watering box to ensure as much accuracy as possible. The Committee may want to consider a buffer for water within the measurements, regardless of de-watering strategy, as complete removal of water is difficult in a high volume fishery. The representative for Marel suggested that a cold water bypass system be developed that could immerse the fish once they are through the scale.

Both Marel and Ryko make their scales out of stainless steel, and are supposed to be easy to operate and clean. They were both designed to withstand the rigors of exposure to the ocean environment and direct contact with seawater. The scale is typically bolted to the floor to avoid movement. Neither scale is designed to be portable.The dimensions of the Marel scale are 6 feet long by 3 feet wide, and the height can be adjusted. The Ryko is 2 feet wide by 6 feet long.

Ryko scales claim to have never slowed a pump down by putting their scale into the system. Marel lists the thoughput of it's flow scale at 70 or 80 tons per hour, depending on belt size, which would slow some of the surveyed boats down.

Both scales are said to have motion compensation built within the system. The representative for Marel suggested that if the scales were to be exposed to the elements, particularly wind or freezing spray, that something may need to be built around the scales, suggesting the sensitivity of the measurements to the elements. The representative for Ryko suggested that the accuracy of a flow scale was between 3 and 7%

3.2 COST

The cost for an at-sea flow scale from Marel is estimated to be around $70,000. Ryko estimated that their flow scale, which works on both land and sea, would cost $50,000. Marel does not currently make a land-based flow scale, but are working on developing one currently, and once certified will likely cost around $70,000 as well.

The Marel scale costs between $3,000 and $5,000 to install plus travel and expenses for the installation technicians. Freight is between $1,000 and $1,500. The Ryko scale ships for between $500 and $1000 with a crate fee of around $500. The majority of Ryko owners do their own instillation.

3.3 MAINTENANCE

Maintenance for the Ryko scales is not expected to be great, and phone support is free, and parts can be ordered individually online. Maintenance for the Marel scales vary, but for vessels going out to sea for multiple months on the West coast, they offer a package of all the parts that could break for $15,000.

3.4 EXPERIENCES

Mr. Kingsolving, a NMFS employee who works with flow scales in the Pacific Northwest and Alaska shared his experiences from the past few years with the Pollock, Rockfish, Flatfish and most recently the Pacific Cod fisheries . He mentioned that space and experience can become large issues when flow scales are used on boats, and suggested that the herring industry might not be the right fit for flow scales at this time. On the west coast his experience was that the cost of a flow scale, total, tended to cost around $100,000 and that the scales themselves needed continual maintenance and tinkering by people experienced in mass-processing facilities, and ought to be used on boats and in areas where mass-processing equipment is routinely used, such as the "motherships" and processing vessels from the west coast. He also mentioned that certification and maintenance issues can become difficult when state weigh-masters become involved and have different standards than the federal agency.

An industry member from the Atlantic herring fishery who owns a processing vessel also shared his experience with a flow scale. Purchased recently, he bought the flow scale used from a company in Norway for around $80,000. The vessel has a 200mt tank, which when the scale was installed, provided fish to two separate de-watering belts before the fish were weighed. The fish then went on to be processed.

The scale itself was a Marel 3-axis, motion compensated scale, which was designed to work on boat. According to his experiences, however, if the scale was not mostly dry and the sea was not calm then the weights that the scale took would be off by several orders of magnitude. In addition, if the catch composition was made up of smaller fish then the scale would also have difficulties taking accurate weights. He proposed that the problem was in the design; that the scale had been made for fisheries which processed larger fish, one at a time, as opposed to being made for use in a pelagic fishery such as herring.

4.0 HOPPER SCALES

4.1 DESCRIPTION

A hopper scale utilizes different chambers which fill up at differing times to keep a continuous flow of product moving through the scale. The advantage of a hopper scale, according to both the Ryco and Marel representatives, is that it can be built in many different sizes to accommodate multiple situations, while still being a relatively simple scale (Figure 32 and Figure 33). They are also said to be easy to calibrate and maintain and can be built for use on land or at-sea. Hopper scales can also be built with multiple hoppers, in which a diverter assures that while one side is filled and weighed, the other side is released, ensuring a faster process.



Figure 32. A Ryco marine hopper scale, in which the fish move from the upper box to the lower box, where the fish are weighed.

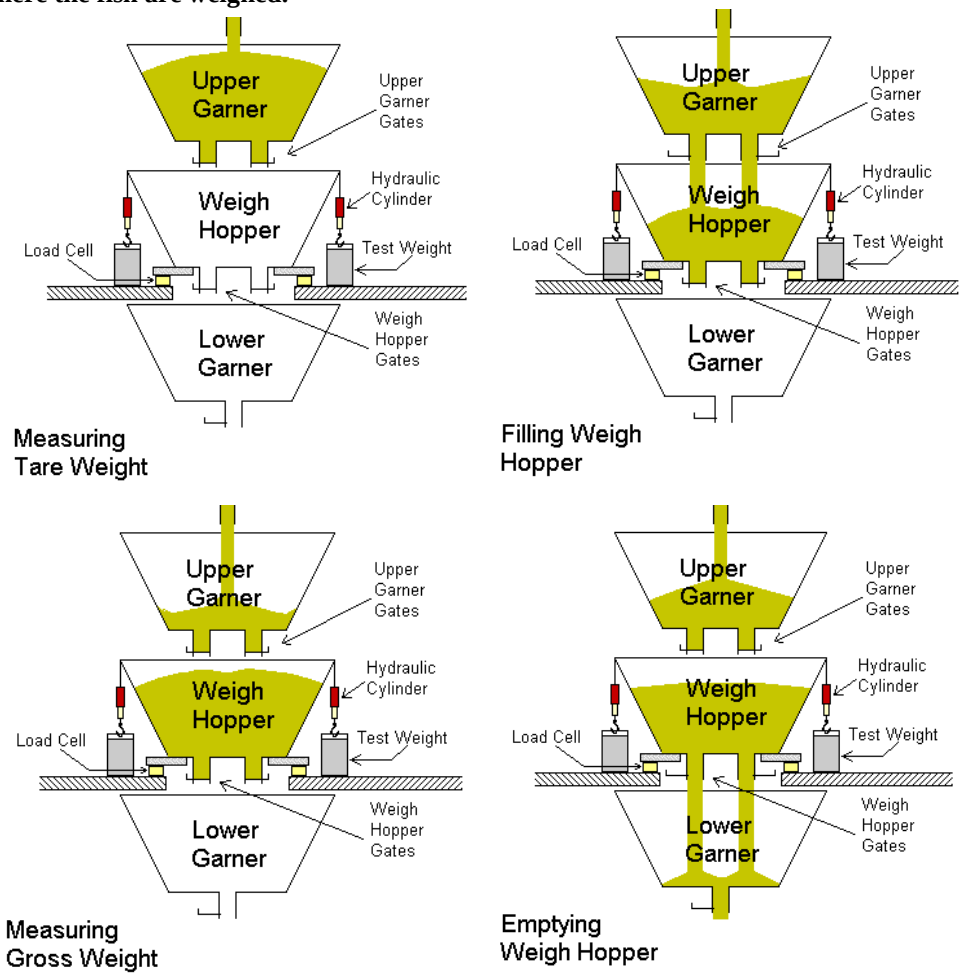


Figure 33. A step by step process through the basic hopper scale process. First, the Upper Garner is filled with the material. Second, the material is released into the Weigh Hopper, where the weight

will be recorded. In the third step, while the weight is being recorded, the Upper Garner Gates are closed, so that the Upper Garner can fill again. In the fourth step the Upper Garner continues to fill while the Weigh Hopper releases its contents into the Lower Garner, so that the Upper Garner can fill the Weigh Hopper again and start the process over. (Photo Credit: USDA)

The Marel representative estimated that the hopper scale would be able to keep up with the pace of the fishery, but may add between 5 to 10 minutes to the process at the worst. In either at-sea or portsides situations the water would need to be removed from the fish for the scale to work. Hopper scales can be portable as long as stationary on the trucks while the weighing is occurring, although long distance and frequent travel is not recommended. According to the Marel representative the hopper scales would be 4 feet by 4 feet square and the height would be adjustable from 5 feet or less to 30 feet. The Ryco representative stated 48 inch square as being the average size, but has seen hopper scales built as small as 24 inches square.

4.2 COST

The cost for an at-sea hopper scale from Marel is estimated to be around $40,000 to 50,000, depending on the modifications needed in each boat. A single hopper that would be situated portside would cost close to $30,000. The Ryko representative estimated that their single hopper would cost $20,000 including shipping and that a double hopper would cost between $35,000 and $38,000.

The Marel scale costs between $3,000 and $5,000 to install plus travel and expenses for the installation technicians. Freight is between $1,000 and $1,500. The Ryko scale ships for between $500 and $1,000 with a crate fee of around $500. The majority of Ryko owners do their own instillation.

4.3 MAINTENANCE

Maintenance for the Ryko scales is not expected to be great, phone support is free, and parts can be ordered individually online. Maintenance for the Marel scales vary, but for vessels going out to sea for multiple months on the West coast they offer a package of all the parts that could break for $15,000.

5.0 TRUCK SCALES

(All information courtesy of Wayne at Cat Scales, Paul Gerard with Advanced Scales and Rice Lake Weighing Systems, Ed at All-Tech Weighing Systems Inc (Portland, ME), Gentle Giant Corporation, The Portland Recycling Center, and the Scale-Mart Corporation).



Figure 34. A truck scale in use (photo credit: http://science.howstuffworks.com/question626.htm)

5.1 FIXED TRUCK SCALES

Fixed truck scales are scales which have been specially constructed and calibrated to give the user the most accurate information possible. Their size depends on what the user is looking for; the scale pieces are modular and a very large scale can be built to accommodate the largest of trucks. Scale pieces come in 20 and 30 foot increments. For the purposes of the herring fishery, the scales could be built to suit each location and the type of trucks that are utilized. There was consensus among all representatives that fixed trucks scales are the most durable of the truck scales for marine weather.

The general procedure for weight verification of herring would be to measure the truck once before the fish are transferred and once after; the difference would be the estimate of the weight of the herring. If the truck is going to be hauling out barrels or boxes full of fish, those items could be placed in the truck for the pre-fish weigh-in.

The difficulty is that in each location there would need to be a permanent structure which is large enough to accommodate trucks, infrastructure and the equipment associated with the scale (computers, on and off ramps, etc.). The scales also require a power source.

The estimates for fixed scales range widely from $30,000 to $100,000. The cost for the scale itself depends mostly on size; a middle of the road, 70 foot scale is approximately $40,000. The cost escalates, however, with the addition of shipping costs and installation, which typically cost $4,000 each. The cost of a foundation is also large and varies widely depending on the area of installation. The average estimate is around $15,000 to $18,000. All together the average scale would cost $65,000, if everything went well. One estimation that that came to a total of $100,000 included cement piers and other structural modifications beyond simple bulldozing and laying foundation. With the

structural challenges at many offloading sites, installation of scales may be made significantly more expensive.

5.2 EXISTING TRUCK SCALES

One alternative to buying the fixed truck scales is utilizing existing truck scales which are for hire. Before a truck is scheduled to come and retrieve herring from the docks, a weight measurement could be required on its route. The truck would complete the loading of the herring as normal, and then on the way its destination, it could be weighed again. The difference between the two weights would be the weight of the fish, and any ice that is put in with the fish.

The advantage to this is cost; the approximate cost for weighing a truck is between $10 and $15, a cost which typically covers multiple re-weighs in the same 24 hour period. Many have been set up under very specific guidelines provided by the scale companies and the state Department of Agriculture, and they are inspected yearly by the same department. Certain companies even offer guarantees for their measurements; if you are fined or taken to court; they will either pay the fine or accompany the customer to court (CAT Scales).

Using existing truck scales and infrastructure presents two problems. The first is availability. While most ports that herring are landed (communities of interest, Amendment 1 to the Atlantic Herring FMP) have scales nearby (see Figure 35 through Figure 43), two ports have scales that are at least an hour away from the port: Sebasco Estates and Point Judith. The two most northern ports in Maine, Prospect Harbor and Lubec/Eastport, are not located near scales. The two island ports, Stonington and Vinalhaven, do not have scales on them, however it is questionable of trucks are used. In some ports, driving to an available scale may require driving a long distance, particularly if the truck is destined for only a few miles away. Encountering a scale may be difficult, due to the large spread of destinations for the trucks, and could lead to excessive driving. This in turn could ruin the fish, if they have to be in the heat for too long. Fish could also be compromised if the line for the scale is long, and the truck full of herring is forced to wait until the scale is free (Figure 14).

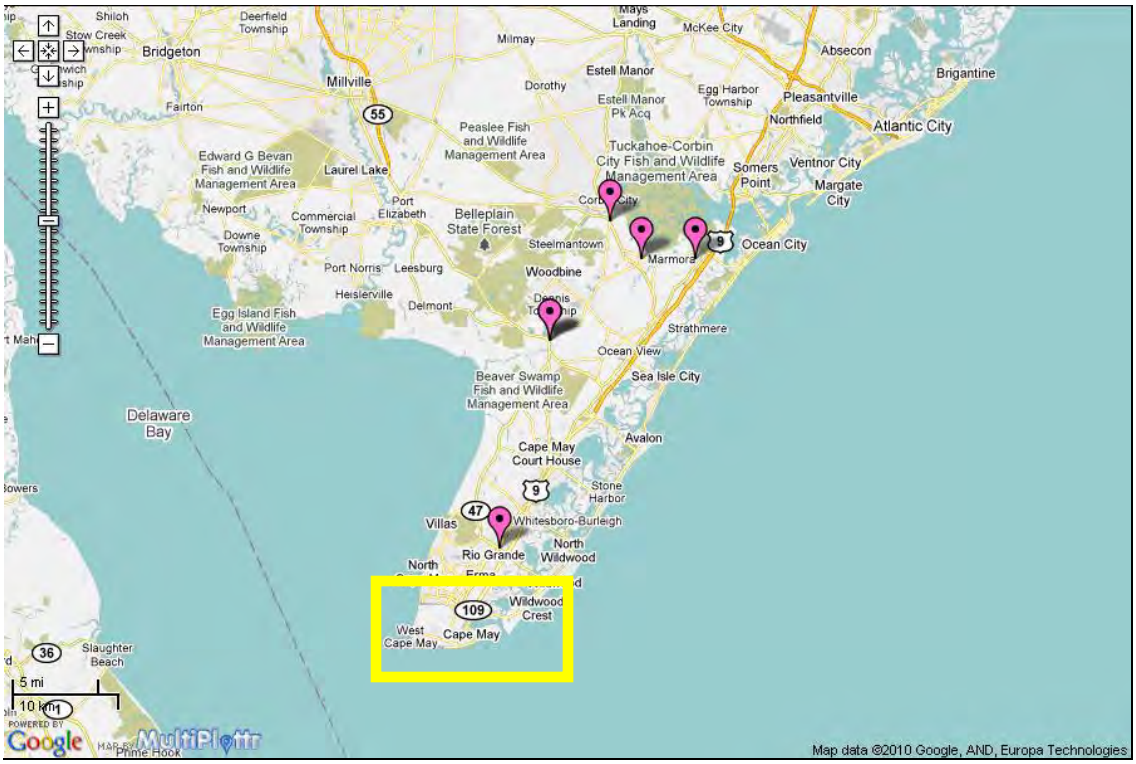


Figure 35. Existing truck scales in the Cape May, NJ area, marked with violet markers. The yellow box indicates a Community of Interest (Amendment 5). The closest approximate port-to-scale drive time is ten minutes and the furthest port-to-scale drive time is 33 minutes. (maps.google.com)

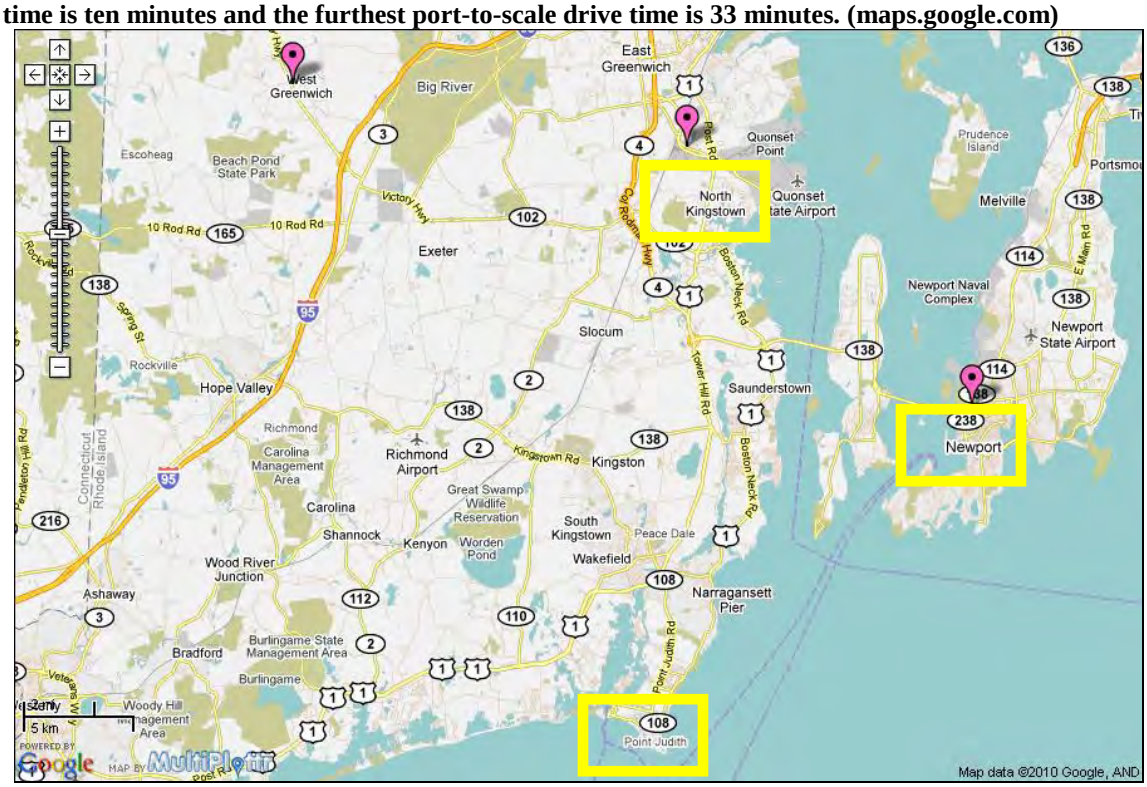


Figure 36. Existing truck scales in the Point Judith, Newport, and North Kingstown, RI areas, marked with violet markers. Yellow boxes indicate Communities of Interest (Amendment 5). The closest approximate port-to-scale drive time is less than five minutes and the furthest port-to-scale drive time is approximately 42 minutes (maps.google.com)

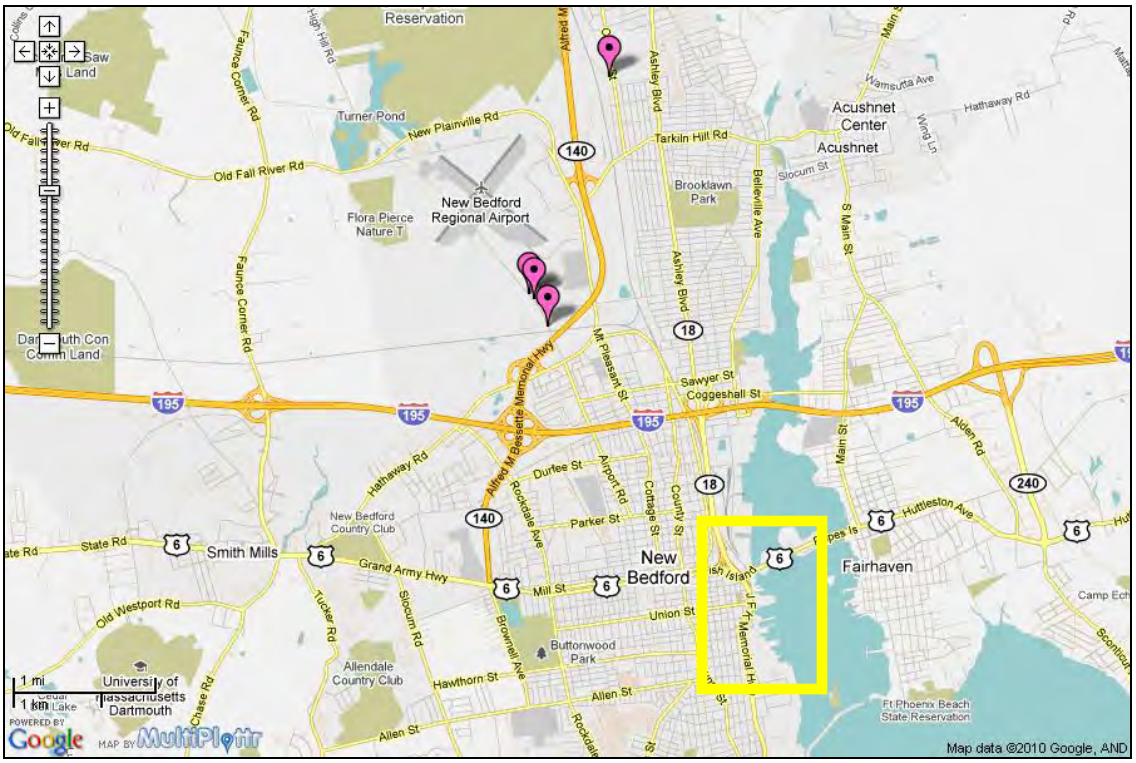


Figure 37. Existing truck scales in the New Bedford, MA area, marked with violet markers. Yellow box indicates a Community of Interest (Amendment 5). The closest approximate port-to-scale drive time is eight minutes and the furthest port-to-scale drive time is five minutes. (maps.google.com)

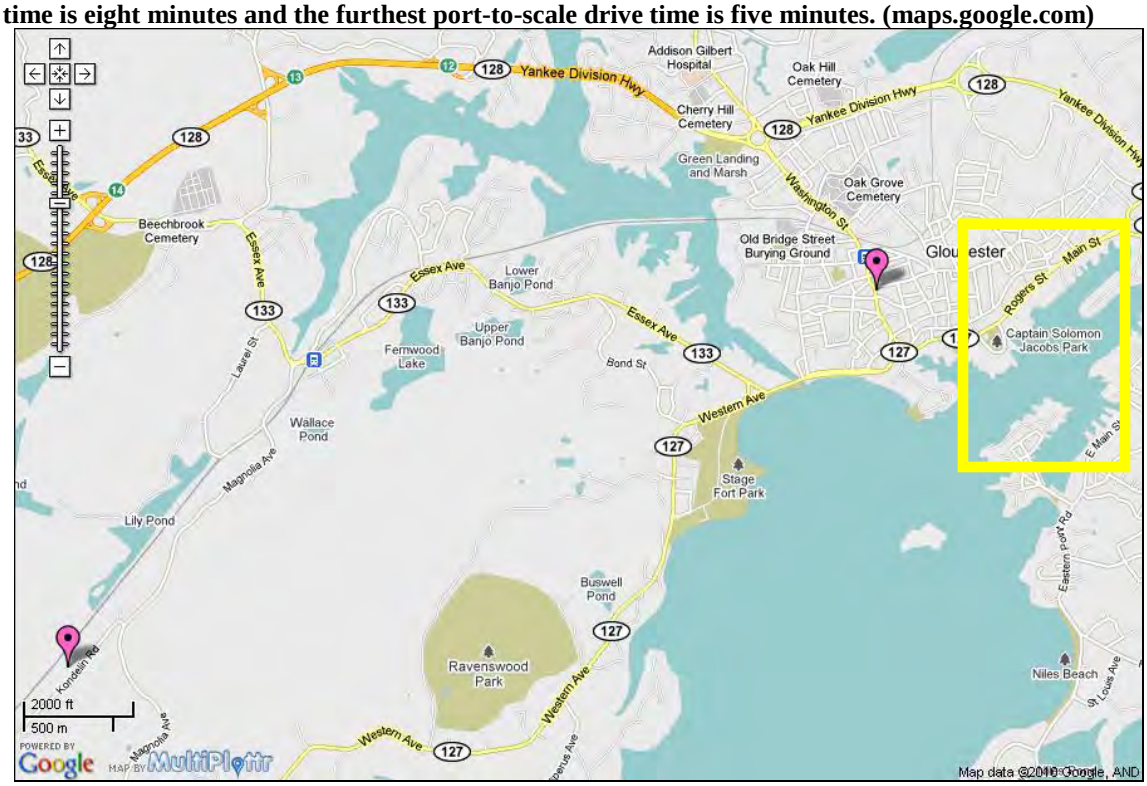


Figure 38. Existing truck scales in the Gloucester, MA area, marked with violet markers. The yellow box indicates a Community of Interest (Amendment 5). The closest approximate port-to-scale drive time is < 5 minutes, while the furthest is 11 minutes. (maps.google.com)

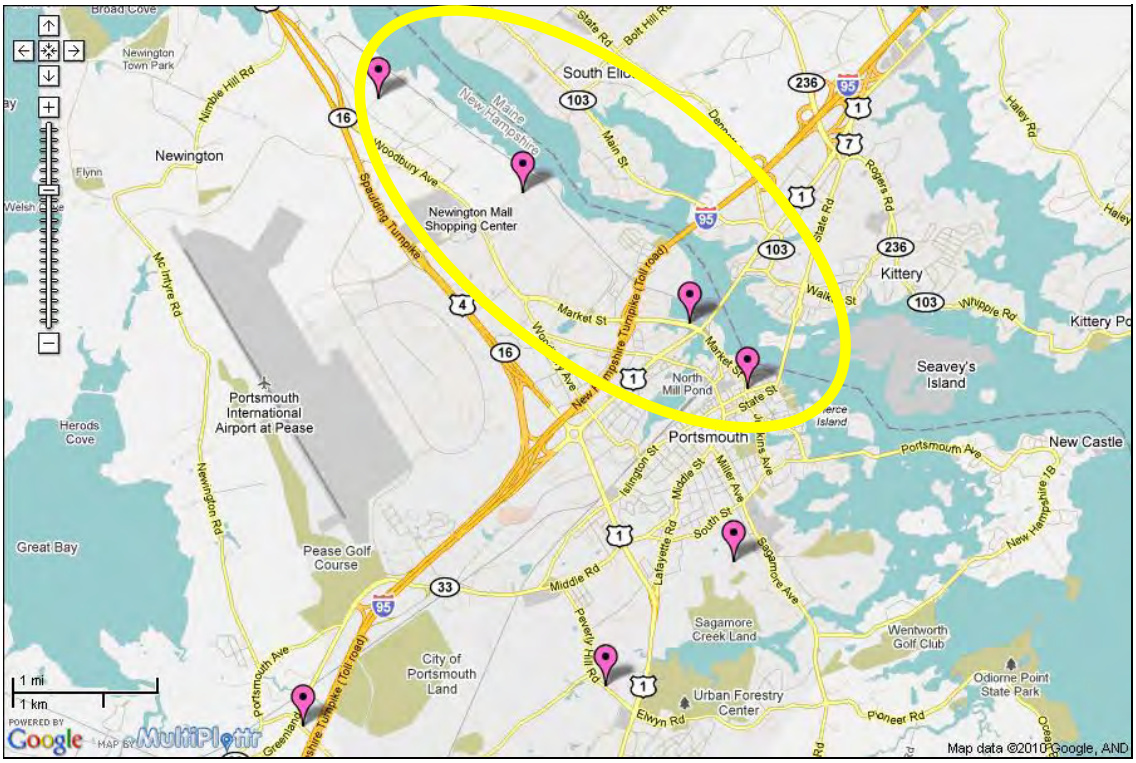


Figure 39. Existing truck scales in the Portsmouth, NH area, marked with violet markers. The yellow indicates a Community of Interest (Amendment 5). The shortest approximate port-to-scale drive time is less than five minutes, the while furthest is 11 minutes. (maps.google.com)

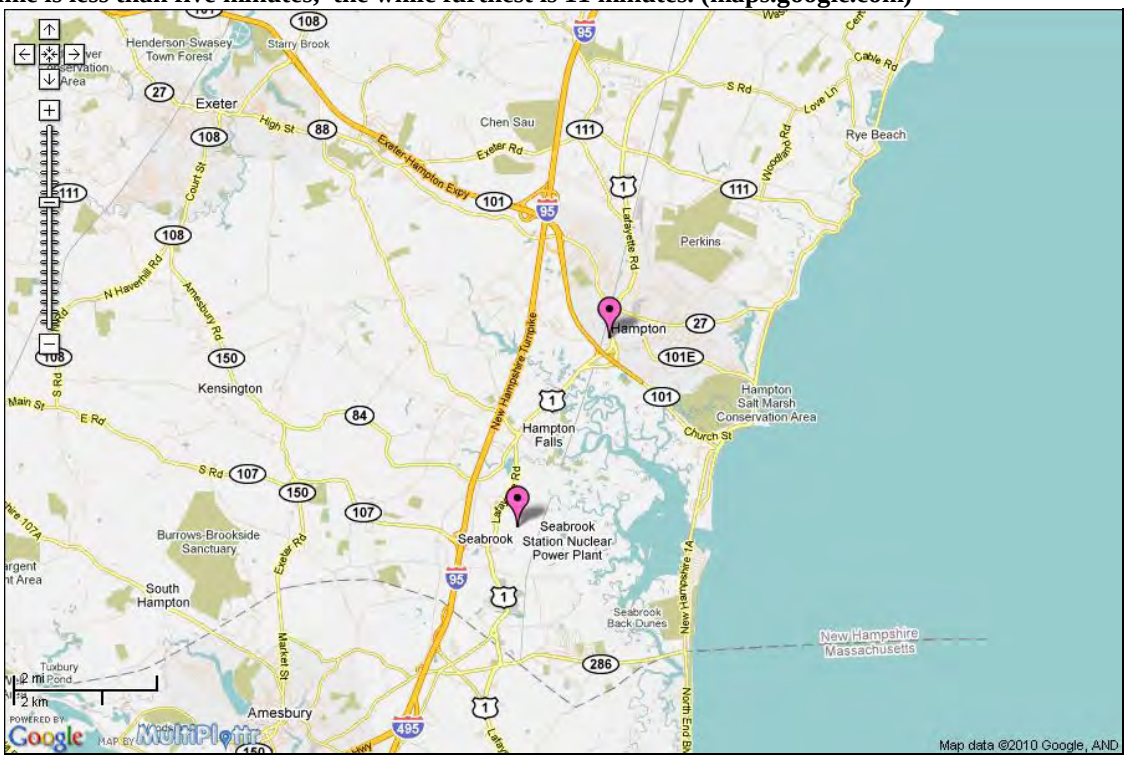


Figure 40. Existing truck scales in the Hampton/Seabrook, NH area, marked with violet markers, closest to the Communities of Interest (Amendment 5). The shortest approximate port-to-scale drive time is six minutes and the furthest port-to-scale drive time is 13 minutes. (maps.google.com)

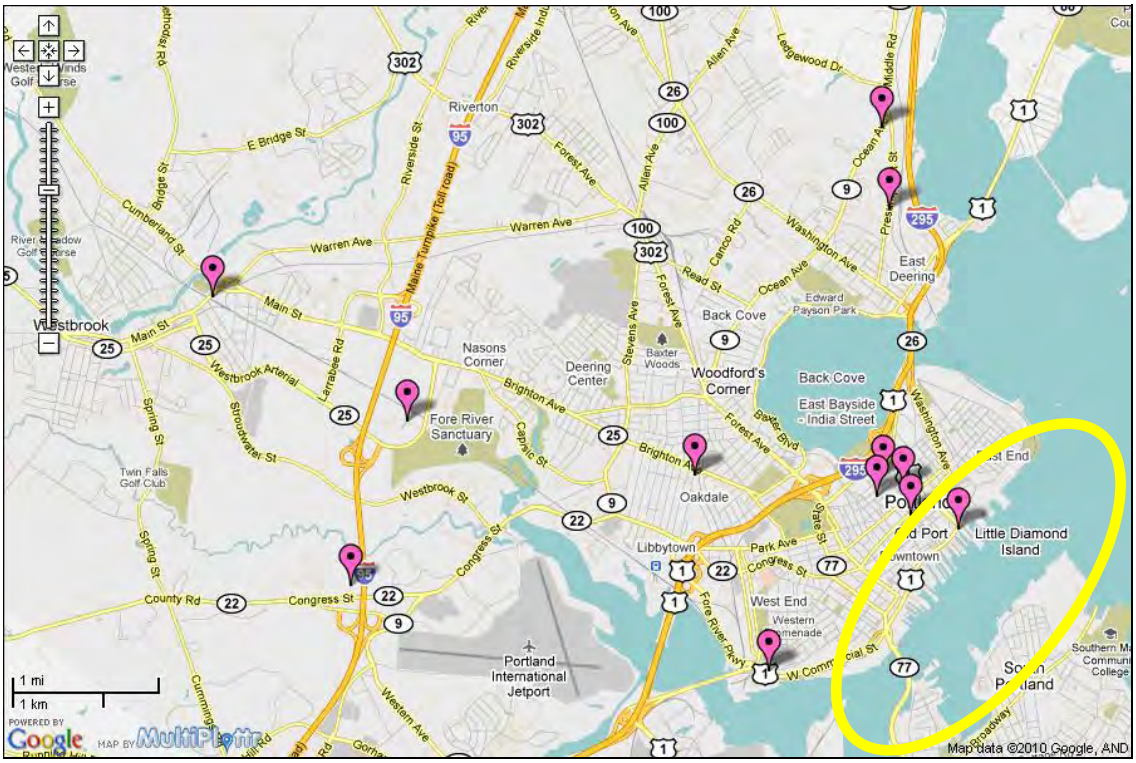


Figure 41. Existing truck scales in the Portland, ME area, marked with violet markers. The yellow indicates a Community of Interest (Amendment 5). The closest approximate port-to-scale drive time is less than five minutes and the furthest port-to-scale drive time is 15 minutes. (maps.google.com)

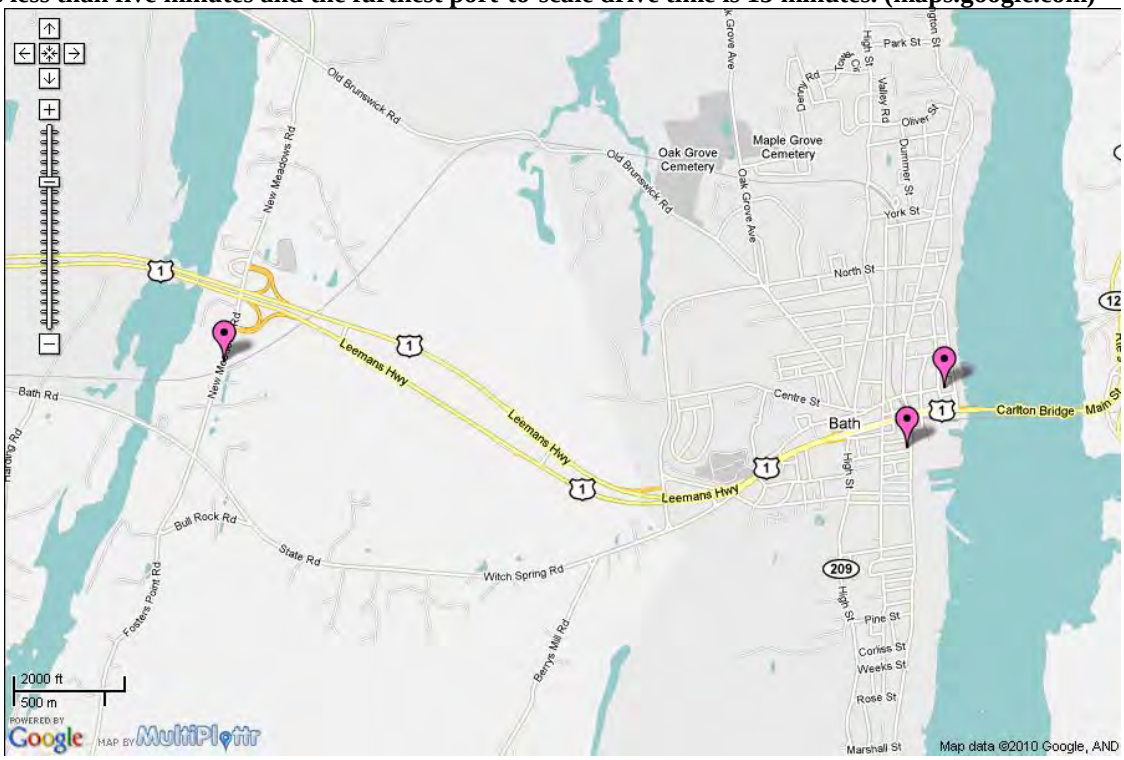


Figure 42. Existing truck scales in the Bath, ME area, marked with violet markers, closest to the Communities of Interest (Amendment 5). Both the shortest and longest approximate port-to-scale drive times are less than five minutes. (maps.google.com)

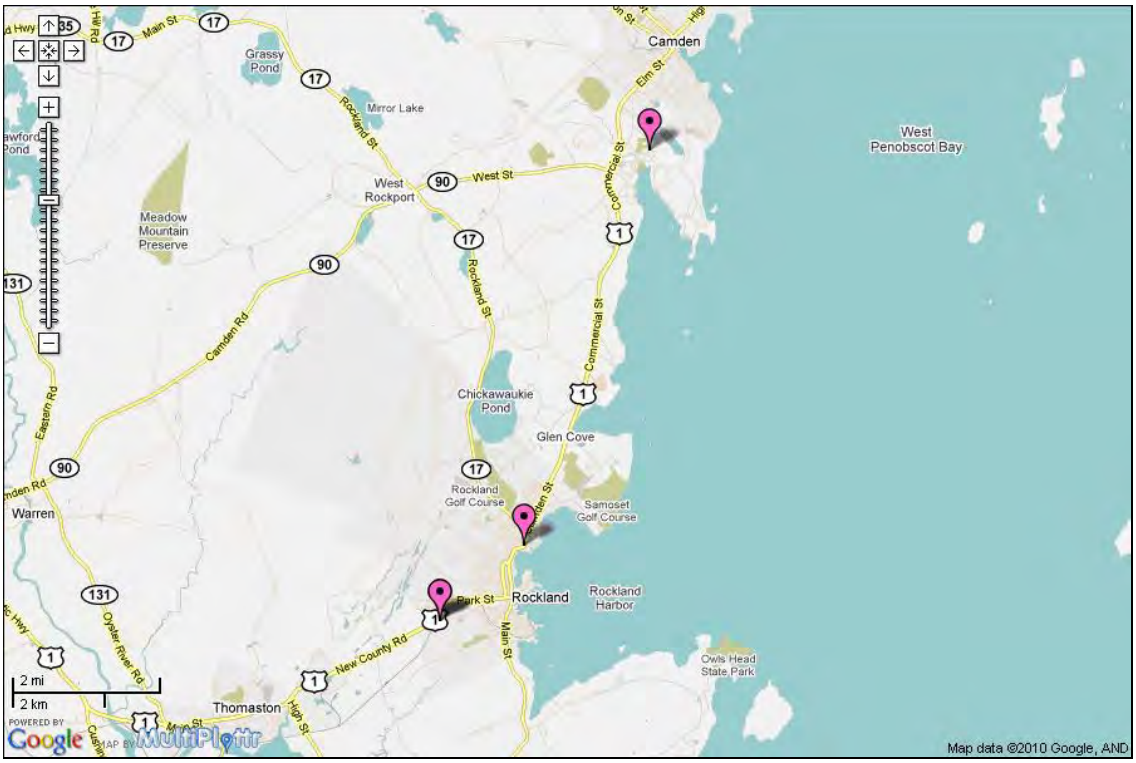


Figure 43. Existing truck scales in the Rockland area, marked with violet markers. Yellow boxes indicate Communities of Interest (Amendment 5). The closest port-to-scale drive time is approximately less than five minutes and the furthest port-to-scale drive time is approximately 11 minutes. (maps.google.com)

The other issue is the involvement of a third party. The company or organization which allows the scale to be used is neither the buyer nor the seller, but they will instantly be involved in the transaction. Legally, in order to issue a certified measured weight for payment for another party, the person issuing the information has to be licensed to print the ticket and give both parties a gross weight. This certification means that the slip of paper with the weight on it has to have an impression seal. Many of the scales in the range of the ports which land herring do not have a certified weigh master at their location around the clock, and the trucks could only be weighed at certain hours, which in turn could present a large hurdle for the buyers of herring. (Steve Giguere, Maine Dept. of Agriculture, Weights and Measures Inspections)

Another other option is place people such as portside samplers into these roles and train them to be certified weigh masters. The cost is $25 per person per year to be certified, plus any additional training. Harbormasters may be another group of people to train and have ready at different times in the day. The difficulty would still be availability of scales for the observers to operate and the cost of the observer or weigh master salary. (Steve Giguere, Maine Dept. of Agriculture, Weights and Measures Inspections)

Using existing scales could be an option, but it will require a lot of coordination and possibly extra driving for trucks and decreased quality for fish.

5.3 PORTABLE TRUCK SCALES

5.3.1 Large Portable Scales

There are two types of portable trucks scales. The first is a rather large scale, and is very similar to the fixed truck scales, as it comes in units of around 35 feet. The units can be disassembled and placed into a flat bed truck for transportation, but portability is an issue with such large pieces. The scale does require a power source. The cost is less than the permanent scales, as two units of 35 feet, for a total scale of 70 feet, average around $25,000 to $30,000.

There are a few major issues with the portable scales, in addition to the cost. Using a portable scale is very similar to using a fixed scale; the infrastructure around the scale has to be close to perfect in order to facilitate a correct measurement. Approaches and exit ramps must be built to specification around the scale, which typically require bulldozers or heavy machinery because the mounds have to be perfectly straight. If the mounds are not perfectly straight the truck will put uneven pressure on the scale and possibly break inner components. They must be installed in a non-muddy area and the ground must stay relatively dry, which may be difficult with a large amount of water leaving the trucks after pumping the fish. (All-Tech Weighing) The other disadvantage is that the scale cannot legally be left in place for more than six months, so if the Committee wanted to utilize one for a season to determine its effectiveness, the scale would likely have to be removed before the season ends. (Steve Giguere, Maine Dept. of Agriculture, Weights and Measures Inspections) There can also be issues with the calibration and sensors within the scale if the scale is taken over bumpy roads or for long amounts of time.

5.3.2 Wheel Pads



Figure 44. A wheel pad (photo credit: http://www.onboardscales.com/wheel-weigher-truck-1.htm)

The other form of portable scale is a very small and portable. Typically weighing around 40 pounds this scale operates on batteries and can come in either raised metal models or flat LCD models. The cost for the weigh pads is slight; between $2,200 and $5,000 per

pad. No installation is required. The pads are used by driving onto a pad, one or two wheels at a time and tallying the weight on all of the wheels

The disadvantages of this scale is that accuracy range, particularly for larger, heavier vehicles, is so poor that the scale cannot be classified as legal for use in trade. That means that the weights that could be measured via these pads would not be able to be used for payment between herring seller and buyers. Within the scale industry these are only sold for law enforcement purposes.

5.3.3 Axle Pads

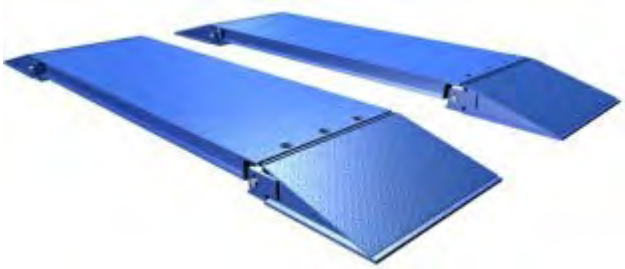


Figure 45. Axle pads (photo credit: http://truckscales.com/index2.htm)

Axel pads are very similar to wheel pads in that they are small and portable. The user drives the truck, two wheels at a time, onto the two axle pads. They are typically 7 feet long and have built in on and off ramps. This means that the area utilized for this scale do not require much more than a flat surface and an energy source, such as a generator. The cost for axle pads is around $13,000 for two.

Also similar to the wheel pads, these axle pads cannot be used for payment between sellers and buyers and are typically only sold for law enforcement purposes.

5.4 ACCOUNTING FOR ICE AND WATER

As was previously explained (Section 1.2), ice may or may not be used to keep fish cool when being transported. In considering all the three types of scales mentioned above it, will be important to factor in an uncertainty into estimates for ice and water, particularly if it is known that ice is being used in the truck. If a truck scale is used it is possible to weigh a truck when full of ice, then again when full of herring, and take the difference. Alternatively, the weight of the ice which is bought for the truck could be added to the pre-herring truck weight. On hot days, however, it is unlikely that the ice will not melt and therefore change the measurements accordingly.

In addition to the possibility of ice in the trucks, uncertainty in truck scale measurements should also be factored in for all catch due to water weight. Although most fish go through at least one de-watering box before entering the truck, not all the water will be removed. Even if the truck waits to drain all the water out of the trailer it is still possible

for some of the weight to be attributed to water. (Industry Members, Personal Communication)

6.0 CERTIFIED VOLUMETRIC ESTIMATES

6.1 SEALING AND MEASUREMENTS

The State of Maine requires that all boats have their vessel holds measured (Section 7.1), and charges each boat based on the size and a rental fee. The cost is approximately $3 a hogshead up to 100 hogsheads, and is $1 a hogshead thereafter. There is also a cost of around $50 a day to rent the meter required to do the work. For a 100 hogshead boat this means the cost would be around $350.

The process of the certification needs to be understood to estimate how the program would work federally, however. In order to determine the volume, seawater is pumped into the hold using a 3 inch trash pump (a pump which is not hindered by objects in the water) to pump water through a mass flow meter. When the meter shows that 5 hogshead worth of water has been pumped into the hold, the process is stopped and a mark is made on the hold's wall to indicate where 5 hogshead is. This process is repeated over and over until the hold is full, then the water is drained and the marks made permanent. This allows anyone to lean into the hold, look at the side, and determine how much volume of fish exists.

The process can take a full day and more, depending on how large the hold is, and requires two men. Because the mass flow meter is very accurate, based on measurements of oscillations through a tube, and due to the difficulty in finding them, the cost of the mass flow meter is estimated to be between $20,000 and $25,000. Departments of weights and measures in other states may benefit from having this meter in their office, as it can pump many forms of solids and liquids, however between the cost of the meter and the cost of labor, this option would be expensive for the states if implemented. None of the states between New Jersey and New Hampshire had a flow meter available for use, and all recommended that the process be done by either the State of Maine or a federally qualified weigh-master.
(Steve Giguere, Maine Dept. of Agriculture, Weights and Measures Inspections)

An alternative to using the State of Maine for certification would be to use a Marine Surveyor. Most Marine Surveyors cost around $100 dollars an hour, plus travel and expenses. For a simple volumetric measurement and certification, using the dimensions of the hold, the cost could be estimated between $300 and $600, depending on the person employed. The accuracy of this method is questionable, however, as the holds are not always uniform or square. Use of a flow meter would likely produce a far better estimate of volume, as the water can adjust to the different shapes and sizes. The other issue with use of Marine Surveyors is the accreditation. Surveyors are not regulated, but there are a few accreditation societies. Some merely charge a fee, however, and require no testing or

adherence to standards. While one option may be to require a certain form of equipment and a certain type of procedure, in certifying holds, the cost of equipment and procedure may serve to drive the cost of the certification up, and it may be cheaper and more accurate to question the integrity of the surveyor, rather than the equipment.
(Thomas Hill, Marine Surveyor)

To perform a similar process on a truck or container both would need to be certifiably sealed, to ensure that no water escapes. If either has a uniform bottom, however, it is relatively simple to use a tape measure to estimate volume, and convert that estimate to hogsheads.

Once the holds have been marked there is a method for achieving more accuracy than a visual confirmation. The concept is to take a heavy object that is lowered into the hold on a tape or pole and does not displace the water. The height of the water and fish is measured against the tape or pole, which can then be expanded to the entire volume using a table or graph. If the hold already has demarcation of the volume, then the volume can be checked visually
(Steve Giguere, Maine Dept. of Agriculture, Weights and Measures Inspections)

6.2 VOLUMETRIC UNIT CONVERSION

Another difficulty faced in volumetric measurement is units. One unit of hogshead can vary in interpretation. Conversion between units is also difficult with water involved; an average ought to be decided by the committee for converting a volume to a weight. In both Europe and Maine, where certified volumetric measurements are used, the conversion between volume and weight has been specified to avoid confusion, and has been for some time (see Appendix A for a historical document from Maine and Section 7.3 for discussion of the European regulations). Similarly, the State of Maine is currently working to determine how much weight there is per bushel of harvested menhaden. The Southeast Fisheries Science Center has been utilizing a “standard of fish” as its conversion factor in the menhaden fishery, and the units seem to work well; it was hypothesized that if a deck log on any given boat were to be surveyed that the sum of the at-sea estimates would come within a margin of 5% accuracy (See Appendix B for a historical documentation). The Committee may want to specify units of measurement used in certified volumetric measurements, if they are pursued. A table of units and their conversions can be found in Table 4.

		Volume		**Weight**		
	Unit	Cubic Meters	Bushels	Short Tons	Metric Tons	Pounds
State of Maine	Hogshead	0.62	17.50	0.61	0.56	1,225.00
European (Herring)	Herring Unit	100.00	28.38	90.39	82.00	180,780.00
European (Mackerel)	Makerel Unit	100.00	28.38	85.98	78.00	171,961.00
Southeast Science Center (Menhaden)	Standard Fish	0.36	10.23	0.34	0.30	670.00

Table 4. A table of conversions from volume to weight used at different times and locations

7.0 REGULATIONS REQUIRING WEIGHING OF FISH OR VOLUMETRIC MEASUREMENT

7.1 STATE OF MAINE

Regulations in the State of Maine already require that herring vessels have their fish holds measured and "sealed" by the State Sealer of Weights and Measures, so many vessels in the herring fishery already have the information necessary to determine the capacity of the fish holds. Relevant regulations from the State of Maine are summarized below.

- Sealing of boats. The holds of all boats transporting herring for processing purposes must be measured and sealed by the State Sealer of Weights and Measures or the State Sealer's designee.
- Fee. The owner of the boat shall pay a fee for the measuring and sealing as determined by the State Sealer of Weights and Measures, based on the carrying capacity of the boat.
- Method of measuring and sealing. The measure must be in 5 hogshead divisions measured by liquid measure from a calibrated prover to the top of the hatch coaming. The measurement must be marked and permanently sealed, both forward and aft, in the hold, in the most practicable manner, while the boat is afloat.
- Notification of broken seals. The boat owner shall immediately notify the State Sealer of Weights and Measures of any alteration or the breaking of any seal.
- Certification to commissioner. After measuring and sealing each boat, the State Sealer of Weights and Measures shall certify to the commissioner the name of the owner and the name and capacity of each boat.

(Note: 1 hogshead = 17.5 bushels = 1,225 pounds)

7.2 FISHERIES OF THE EXCLUSIVE ECONOMIC ZONE OFF ALASKA

The equipment and operational requirements established by NMFS (§ 679.28 (Alaskan Fisheries) and § 680.23(Shellfish)) state that a vessel must have the on-board scale approved when initially installed and inspected by NMFS personnel each year thereafter (proved with a sticker and/or inspection report). In order to be approved, the scale make and model must be listed on a Regional Administrators list, and proof of initial laboratory testing must be provided, along with information about the specific scale. Custom hopper scales can be approved under certain qualifying conditions.

During annual inspections the responsibilities of the vessel owner are explained in the regulations. The vessel owner must also test the scale once daily and record specific information from the scale which is relevant to the test. The test itself is outlined in the regulations for each type of scale and for the weights used to conduct the test. The vessel owner must also perform regular maintenance and print reports daily. The reports have a list of required information such as pounds measured in a specific timeframe and basic vessel information and it is specified how long the reports need to be available and to whom. All weighed catch is reported. The scale cannot be installed where it may be

bypassed easily and observers must be able to see that all catch is being passed through the scale.
(http://www.fakr.noaa.gov/regs/680/680b23.pdf;
http://www.fakr.noaa.gov/regs/679b28.pdf)

7.3 EUROPE

All E.U. and Norwegian-registered fishing vessels that carry their catch in refrigerated sea water (RSW) tanks are required to carry on-board calibrated volume tables for all of the fish tanks on the vessel. Those calibration tables must be checked and stamped by the member state under whose flag the vessel operates. The calibration tables are normally produced by the marine architect when the vessel is in the final stages of building; this will then be certified by inspectors from the fishery control of that state. In the case of a second-hand or converted vessel coming into the fishery, all the fish tanks have to be measured separately and calibrated by a competent marine architect, and again verified by an inspector. The calibration system works by measuring the entire volume of the tank to get its cubic capacity; the tank is measured in 10 cm increments, and this is scaled from the floor up to the edge of the hatch.

To actually measure the volume of fish in the tank, the fishery officer drops a small, flat steel weight about six inches square, connected to the end of a regular tape. When the weight falls through the water and settles on the fish, the officer then checks off the measurement against the hatch top. With this measurement, the officer can go to the calibration book for the vessel and calculate the cubic volume of fish in the tank. This process is then repeated on all the other tanks that contain fish, and the total cubic volume is calculated.

Because a cubic meter of fish does not equal a ton of fish, it was agreed with all control agencies in Europe and Norway that the following volume calculation values should be used:

- Herring per cubic meter x 0.82 (i.e., 100 cubic meters = 82 tons of herring)
- Mackerel per cubic meter x 0.78 (i.e., 100 cubic meters = 78 tons of mackerel)

This system has been in place for over 20 years and has been tried and tested many times, with total catches monitored and weighed in controlled conditions. It was always found to have an accuracy of between two and seven percent, depending on how accurate the person was when measuring. The vessels were originally allowed a discrepancy of 20% in what they declared and what the final result was, but this was found to be unnecessary. The discrepancy is now reduced to 10%, and both fishermen and control agencies feel comfortable working with this level.

7.4 CANADA

The Report on the Atlantic region dockside monitoring program and procedures for Fisheries and Oceans Canada (DFO) specify that Dockside Monitoring Companies (DMC) be established with a number of requirements. The policy establishes that the proper equipment must be available 24 hours a day and maintained via operational

procedures and set requirements established by the individual DMCs. It also specifies that records of deployment of the Dockside Observers be readily available via databases or hard copies and that the information and data that is collected be protected under the provisions of the Privacy Act and maintained and archived for two and one-half years. Procedures are outlined for training observers, including demonstrating proficiency in "fish handling practices, off loading methods, and weigh-out methods and practices" and that Dockside Observers are trained in the weighing procedures that have been approved by the DFO. The duties of the Dockside Observer require that all dockside monitoring occur at a fish landing station, government wharf, or fish-buying wharf. All catch that is offloaded must be weighed and a clear line of sight from the boat to the scale must be maintained at all times. All boats must be checked after the offloading to certify that all catch has been removed, and the Dockside Observer can inform the off-loader that and all remaining fish be removed.
(http://www.dfo-mpo.gc.ca/communic/fish_man/ardmp/ardmp-pvqra_e.htm)

The Scope of the Fishing and Fish Products Sector Review, conducted by Measurement Canada, is in the process of establishing "an appropriate level of involvement for Measurement Canada in this industry to ensure measurement accuracy and equity" based on stakeholder review. Specifically the review will establish their role in regaurds to platform, hopper, crane and truck scales.
(http://www.strategis.gc.ca/eic/site/mc-mc.nsf/eng/lm00296.html)

8.0 SUMMARY

The regulations for the Canadian Dockside Monitors illustrates that while scales may be a useful addition to the herring fishery, it may be prudent to consider them in conjunction with dockside monitoring options in Amendment 5. Logically, any and all scales used to monitor the offloading of a vessel must be available at all times for those boats that must be monitored. Based on fisherman feedback, however, scenes of offloading tend to be complicated by multiple vessels offloading at one time, and care should be taken to avoid creating long backups for vessels which are returning. This may mean having multiple scales available at multiple ports if full scale coverage is required. If selective monitoring is chosen, then scales should be set up and ready to weigh as soon a vessel is ready to unload, to ensure the quality of the fish. Data collection, maintenance and quality should be assured though the monitoring program established. Likewise, once procedures for the chosen scales are established, observers will need to be trained in these procedures, including verification that the vessel is empty. Maintaining a clear line of sight between the vessel and the scale may be difficult, given the current setup of the ports for Atlantic Herring.

Depending on the scale that is decided upon, proper procedures for installation, maintenance, calibration, and re-certification should likely be established by the Committee. Based on multiple interviews it seems reasonable to assume that once a scale is decided upon, the vendor of the scale will be willing and able to help the Committee establish these procedures.

Flow Scales and Hopper Scales

In concept, flow scales have the potential to operate well in the herring fishery, however the speed at which they operate and the potential difficulties they can cause at sea make them less than desirable. Most importantly, the cost of such scales is so high that requiring their use would likely be prohibitive for the fishery. Hopper scales are more functional in the current operations, particularly if used on land. Similar to flow scales, however, the cost is prohibitive and implementing use in all ports or on all boats may not be desirable. Both flow scales and hopper scales are too large and permanent to be moved by portside or at-sea observers. Requirements to land all herring at certain ports may therefore become necessary, unless a frequency of sampling is determined which did not require 100% weighing of all catch. Most importantly, in the process described above (Section 1.2) it was illustrated that a decent amount of water tends to be left with the fish after the de-watering process has taken place. In both the hopper and the flow scales this could influence the recorded weight of the fish (however it may be different at processing plants).

If the Committee would like to utilize the Alaskan regulations, a list of approved scales could provide guidance for the boats purchasing scales and for the administrators who certify them. Conduct during the annual inspections could likewise provide guidance for all parties involved to increase the chances of a precise inspection. Daily tests, which could be specified more clearly once a scale is chosen, would likely also enhance accuracy of the data. The procedures to use and the variables to be produced by the test will depend on the type of scale chosen. All scales which have been reviewed for this discussion paper utilize computer reporting, and therefore would be able to produce a digital report. The required reports would also provide more accurate information regarding catch and the status of the scale. Placement of the scale onboard, however, would depend on the vessel. A requirement for certification of the scale upon initial installation and once a year thereafter would likely produce trustworthy data for the Northeast, particularly if overseen by NMFS personnel. The cost of the personnel in everything listed above is not determined, however, and would add to the already-prohibitive cost of the scales themselves.

Truck Scales

Similar to the flow and hopper scales, the cost of truck scales makes their applicability in management measures difficult. Both permanent and portable truck scales require a large portion of land, which not all ports have, as well as the ability to mold the land to fit the scale's requirements. The modifications to the land and surrounding structures would not only be costly, but require owners rights, which some ports used by the herring industry likely will not have. Moreover, the certification and operation of the scales would need to be done by licensed professionals, which would add an operating cost. NMFS certification of the data produced may also be prohibitive; there is no current arrangement with NMFS regarding trucks and transportation of fish off the water and similar to the flow and hopper scales, there would need to be compensation for the time and efforts of the employees involved in certifications or handling of data.

The use of existing truck scales may be of value for verifying the weight of fish. The cost of using such scales is low, and the locations are close enough to each port that it may be feasible to require trucks to stop on the way in and out. The time spent getting to the locations, both on the way in and way out, needs to be considered. On the way in the truck drivers will need to spend extra time getting to the facility and having the truck weighed. On the way out, the quality of the fish in the truck needs to be considered as well. While the time spent at the facility being weighed may be minimal, the time getting the truck onto the weighing pad properly plus the potential for long lines or other unforeseeable problems could increase the transportation time of the fish. In the summer and the warmer months, this extra time could cause the quality if the fish to be compromised. Alternatively, ice could be used to extend fish quality, but that could add extra time and costs for potential buyers or sellers.

Additionally, in order to be considered valid for commerce, a certified individual would need to do the weighing of the trucks at the facilities. Many of the facilities listed above do not have certified individuals weighing the trucks. Again, NMFS may have additional concerns with these certifications and with the use of some of the facilities as well. Verifying the quality of data may also be an issue, and again, there would need to be compensation for the time and efforts of the employees involved.

Certified Volumetric Measurements

Although the State of Maine is already conducting the procedure, the method used appears to be prohibitive or unaccepted for other state Departments of Weights and Measures. The cost per vessel may not be large, however the number of hours involved would be great for the Department of Weights and Measures, and further involvement from NMFS may be warranted for certification. One option would be to require the certification of all holds but without requirement of method; this would allow individuals to choose to travel to the State of Maine or use a Marine Surveyor. The cost of Marine Surveyors is high, however, and the question of certification of the measurements would also have to be raised. As was stated previously, the Surveyor hired would need to be approved or certified, likely by NMFS or another accredited organization. This option would cause those who live further from Maine to pay more than those who live close.

The method of 5 hogsheads divisions would be ideal to continue as those in the State of Maine who already have their vessels sealed and measured would not have to do so again. The measurement of 5 hogsheads is volumetric; the Committee would need to decide on a standard conversion from volume to weight for the information to be given in pounds, as was discussed in Section 6.2. Standardizing the location of the measurements, the certification process, and the notification of broken seals would most likely prove useful if the measurements are considered.

Overall, the relevancy of any of these measurements needs to be questioned. Application of the same rigorous standards as Europe has would likely produce more accurate information, however all boats in the fishery would need to be checked by a third party for every landing, such as a portside observer, which would increase cost. Although the volumetric measurement could aid captains estimates, the applicability of the information

need to be determined. If the goal is to verify captains and dealer data from VTRs then who will stick the tank and when? What information would the committee hope to gain from such a measure, and at what cost? This measure would most likely be useful if portside samplers are utilized as a concurring measure in Amendment 5.

		Advantages	Disadvantages
Flow Scales		Designed for at-sea weigh-monitoring of fish	Cost: Between $50,000 - $80,000 a scale, plus maintenance fees
			Need for constant (almost daily) maintenance
			Potentially slower than existing pumping rate of fish
			Better suited to processing environments
Hopper Scales		Can be built to fit any situation and size	Cost: Between $35,000 and $60,000 a scale, depending on location
		Sturdy, simple, less maintenance than flow scales	Functions better on land
		Likely can keep up with pumping rate of fish	
Truck Scales			Overall difficulty for all truck scale: NMFS Certification
	Stationary	Can custom build (come in 20 ft increments)	Cost: Around $100,000 with install, depending on installation site
		Very accurate weighing	Permanent installation which requires land modification
			Potential for backup at scales on hot days (herring spoilage)
			Potentially would require Licensed Weigh Master
			Requires power source and possible small building
	Portable	Slightly Portable (requires flatbed)	Cost: Around 25,000-35,000 a scale, without installation
			Have to modify land to install
			Potential for backup at scales on hot days (herring spoilage)
			Potentially would require Licensed Weigh Master
			Requires power source and possible small building
			Can't stay in existing location for more than 6 months
	Existing	Cost: Between $5 and $10 for a weighing	Need to find 24 hour scales
			Need to have a Licensed Weigh Master
			More driving for some ports than others (herring spoilage in heat)
			4 communities of interest are not near existing scales
	Axle and Wheel Pads	Cost: Between $2,200 and 13,000	Not legal for tender (law enforcement only)
		Very portable	Frowned upon by Weigh Masters
			Some require power source
Volumetrics		Cost: Around $350 per vessel	Need to travel to Maine or use more expensive Marine Surveyor
		"Sticking" of vessel is a simple estimation method	Need to agree upon volume -> weight conversion
			Cost/Benefit tradeoff: still an estimation

Table 5. This table presents a summary of the advantages and disadvantages discussed in this document.

9.0 APPENDIX A

(Unpublished, SEFSC in-house document)

VERIFICATION OF MENHADEN CONVERSION FACTOR

Introduction

A preliminary report submitted about 4 months ago stated that the total weight of menhaden per standard "quarter-box" dump of 22,000 cu.in. averages closer to 530 pounds than to the traditionally recognized 667. The lower value was obtained by projecting (from 84 trials) the total weights of fish in a sampling container measuring slightly less than one twenty-third the capacity of the industry's standard dump. Subsequent observations revealed, however, that such procedure fails to allow for the added and sizeable effect of compactness, a factor erroneously assumed negligible during the initial investigation. This report briefly summarizes the findings of a followup study in which the capacity of the sampling container more closely approached that of the standard dump, yet was not so great that the filled container proved too unwieldy when making the desired measurements.

Procedure

In the followup study Bureau personnel used a common "32-gal." steel trash can with a verified capacity of 32.4 gal., or 7,484 cu. in.,

very close to one-third the volume of the standard fish-measuring dump mentioned above. An additional feature of this container was its height, which approximated the depth of the standard dump and thereby helped to overcome most of the bias attributable to expected differences in compactness between fish weighed in the container and those filling a dump.

All told, we obtained the weights of 33 containers-full of fish. These samples consisted mainly of fresh fish 6 to 12 in. long taken from the "raw boxes" of five different reduction plants. They were distributed in time and space as follows:

Month	Port	Number
September	Fernandina Beach, Fla.	1
	Southport, N. C.	1
	Beaufort, N. C.	2
	Reedville, Va.	4
October	Moss Point, Miss.	3
	Fernandina Beach, Fla.	1
	Beaufort, N. C.	7
	Reedville, Va.	8
November	Beaufort, N. C.	4
December	Beaufort, N. C.	2

After their calculation, the net weights of fish in each sample were projected by the appropriate factor (2.94) to the estimated weights of fish of the same size and condition that would occupy a volume of 22,000 cu. in.

Findings

The 33 sample estimates yielded a mean value of 667.6 pounds (per 22,000 cu. in.)--remarkably close to the hypothesized 666.7. The sample standard deviation of 24.6 pounds, when expressed as a fraction of the sample mean, corresponded to a coefficient of variation of only 3.7 percent, which indicates a high degree of sample reliability. More inspection of these results was sufficient to establish the lack of a statistically significant difference between the hypothesized and estimated weights of menhaden per standard "quarter-box" dump.

Further examination of the sampling data disclosed that the principal source of variation in weight per standard dump is fish spoilage. In the half dozen situations where the sampled fish had to be classed as "very soft" because of advanced decay and gross deformation, the projected weights per dump consistently exceeded the estimated mean by large amounts. Significant effects of differences in average fish size or condition could not be demonstrated.

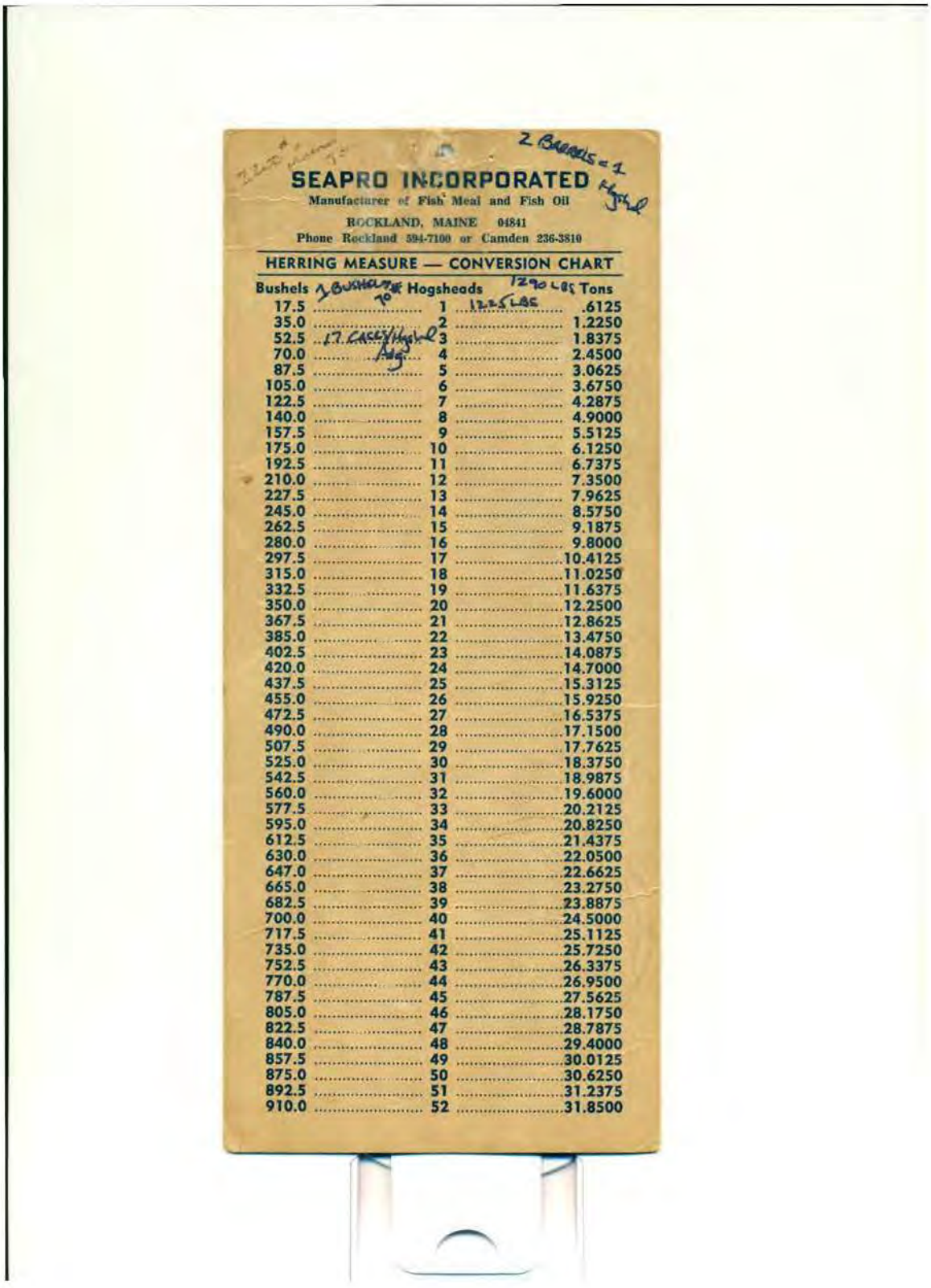
Summary

Having been verified statistically, the factor 0.667--or 0.67, whichever is more convenient--should now be affirmed as the official standard for converting to weight all landings of menhaden measured volumetrically in "quarter-box" dumps and reported by the industry in terms of thousand-fish units (i.e., 1,000 "standard" fish weigh on the average, 667 pounds or one-third short ton).

As suggested in the preliminary study, the same factor should also be used to convert landings reported in thousand-fish units by plants that employ continuous weighing machines. It will be recalled that such machines are calibrated to tally a thousand-fish unit with the passage of every 755 pounds. The 88-pound weight difference has been attributed to additional water, dirt, and slime that adhere to the fish as they are pumped from the vessel with recycled water, and therefore does not have to be taken into consideration when making the conversion. The propriety of this add-on will be checked as circumstances permit.

JHK
1-26-66

10.0 APPENDIX B



2 BARRELS = 1 Hogshead

SEAPRO INCORPORATED

Manufacturer of Fish Meal and Fish Oil

ROCKLAND, MAINE 04841

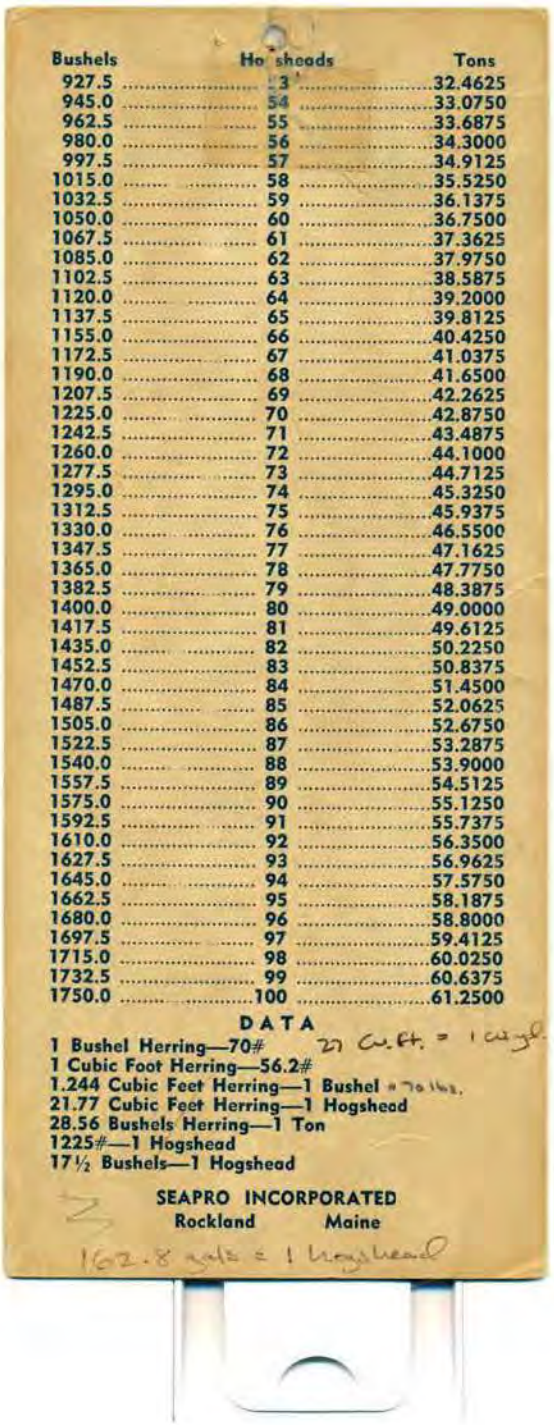
Phone Rockland 594-7100 or Camden 236-3810

HERRING MEASURE — CONVERSION CHART

1 BUSHEL = 70 LBS

1290 LBS Tons

Bushels	Hogsheads	Tons
17.5	1	.6125
35.0	2	1.2250
52.5	3	1.8375
70.0	4	2.4500
87.5	5	3.0625
105.0	6	3.6750
122.5	7	4.2875
140.0	8	4.9000
157.5	9	5.5125
175.0	10	6.1250
192.5	11	6.7375
210.0	12	7.3500
227.5	13	7.9625
245.0	14	8.5750
262.5	15	9.1875
280.0	16	9.8000
297.5	17	10.4125
315.0	18	11.0250
332.5	19	11.6375
350.0	20	12.2500
367.5	21	12.8625
385.0	22	13.4750
402.5	23	14.0875
420.0	24	14.7000
437.5	25	15.3125
455.0	26	15.9250
472.5	27	16.5375
490.0	28	17.1500
507.5	29	17.7625
525.0	30	18.3750
542.5	31	18.9875
560.0	32	19.6000
577.5	33	20.2125
595.0	34	20.8250
612.5	35	21.4375
630.0	36	22.0500
647.0	37	22.6625
665.0	38	23.2750
682.5	39	23.8875
700.0	40	24.5000
717.5	41	25.1125
735.0	42	25.7250
752.5	43	26.3375
770.0	44	26.9500
787.5	45	27.5625
805.0	46	28.1750
822.5	47	28.7875
840.0	48	29.4000
857.5	49	30.0125
875.0	50	30.6250
892.5	51	31.2375
910.0	52	31.8500



Bushels	Hogsheads	Tons
927.5	53	32.4625
945.0	54	33.0750
962.5	55	33.6875
980.0	56	34.3000
997.5	57	34.9125
1015.0	58	35.5250
1032.5	59	36.1375
1050.0	60	36.7500
1067.5	61	37.3625
1085.0	62	37.9750
1102.5	63	38.5875
1120.0	64	39.2000
1137.5	65	39.8125
1155.0	66	40.4250
1172.5	67	41.0375
1190.0	68	41.6500
1207.5	69	42.2625
1225.0	70	42.8750
1242.5	71	43.4875
1260.0	72	44.1000
1277.5	73	44.7125
1295.0	74	45.3250
1312.5	75	45.9375
1330.0	76	46.5500
1347.5	77	47.1625
1365.0	78	47.7750
1382.5	79	48.3875
1400.0	80	49.0000
1417.5	81	49.6125
1435.0	82	50.2250
1452.5	83	50.8375
1470.0	84	51.4500
1487.5	85	52.0625
1505.0	86	52.6750
1522.5	87	53.2875
1540.0	88	53.9000
1557.5	89	54.5125
1575.0	90	55.1250
1592.5	91	55.7375
1610.0	92	56.3500
1627.5	93	56.9625
1645.0	94	57.5750
1662.5	95	58.1875
1680.0	96	58.8000
1697.5	97	59.4125
1715.0	98	60.0250
1732.5	99	60.6375
1750.0	100	61.2500

DATA

1 Bushel Herring—70# 27 Cu. Ft. = 1 cu yd.
1 Cubic Foot Herring—56.2#
1.244 Cubic Feet Herring—1 Bushel = 70 lbs.
21.77 Cubic Feet Herring—1 Hogshead
28.56 Bushels Herring—1 Ton
1225#—1 Hogshead
17½ Bushels—1 Hogshead

SEAPRO INCORPORATED
Rockland Maine

162.8 gals = 1 Hogshead

Appendix II
Herring PDT Portside/Sea Sampling Data Analysis

A: Comparison of (landed) Bycatch Estimates from Portside and At-Sea Observer Sampling Programs in the Atlantic Herring Fishery (July 2010)

B: A Comparison of Porstide and At-Sea Sampling Methods of Estimating Bycatch in the Atlantic Herring Fishery

Amendment 5 Draft EIS

September 2011

Comparison of (Landed) Bycatch Estimates from Portside and At Sea Observer Sampling Programs in the Atlantic Herring Fishery

by

Herring Plan Development Team (PDT)
Matt Cieri (ME Department Marine Resource)
Steven Correia (MA Division of Marine Fisheries)

WORKING DRAFT

1.0 INTRODUCTION

In the past, members of the Herring PDT have estimated total removals of river herring in the Atlantic herring fishery by a combination of portside and at-sea observations. This analysis hinges, however, on the comparability between these two very different methods of documenting bycatch.

Estimates and frequency of occurrence of bycatch in the sea herring fishery is monitored by two independent programs: Maine DMR and Massachusetts Marine fisheries joint Portside sampling program and NOAA' National Observer Program. There are three estimates that are worth comparing:

1) Proportion of trips with occurrences of species
2) The amount of agreement on occurrences of species within trips
3) The amount of agreement on catch weight estimates between the two methodology

This analysis compares the total estimated catch weight for bycatch species for trips that were sampled by both a portside sampling program and the Northeast Fisheries Observer Program (NEFOP).

2.0 SAMPLING METHODS

2.1 AT-SEA OBSERVATIONS

During at-sea operations, NEFOP observers use basket sampling to document occurrence of other species during targeted Atlantic herring and mackerel trips on a haul by haul basis and during normal fishing operations. These non-target species are then included in the data as retained or "Kept" (http://www.nefsc.noaa.gov/fsb/Manuals/JANUARY%202010%20MANUALS/NEFOPM_010110_BOOKMARKS_LONG1.pdf). Normally, ten 50 lbs basket sub-samples are taken at regular intervals during the pumping process from net to hold. These samples are then checked for bycatch, weighed and measures, and the results expanded based on the captains' estimate of that hauls total weight. Because the Atlantic herring fishery is a high volume fishery, much of the bycatch is retained during the pumping process; particularly so for co-occurring pelagic species such as river herring. However, observers do hand select larger bycatch species. In these cases, these species are listed as "discarded" in the database if they are not retained by the crew

2.2 PORTSIDE OBSERVATIONS BY MA DMF

Sampling methodology in the MA DMF portside sampling program attempts to be consistent with NOAA Observer Program protocols, with some modifications to decrease variance in extrapolation of bycatch estimates and reduce potential sampling bias. Due to the large quantities of fish that are typically landed in these fisheries, sub-sampling will be required. Sub-sampling is used when the volume of fish that the sampler is attempting to quantify is too large to obtain actual weights or if the amount of by-catch is too abundant. During sub-sampling, the

sampler will collect smaller batches of fish, sort and weigh by species and then extrapolate to the total catch. All sub-sample weights will be actually weighed (actual weight), and hail weights (for both truckloads and fishing vessels) will be acquired from the plant managers or vessel's captain and therefore estimated (estimate weight).

In most situations, sampling is conducted over the entire offloading period to capture any stratification that may occur throughout the entire fishing activity (e.g. while being pumped aboard while out at sea, due to the difference in species size and composition between tows, settling in the vessel's holding tanks, etc.). Because the catch is not unloaded the same way at every dealer and plant, sampling techniques will vary. Typically samples will be collected systematically at set intervals with predetermined sample sizes. All samples are sorted by species and actual weights will be taken. Lengths will be taken according to the NOAA Observer Program species priority list by statistical area. Haddock, alewife, blueback herring, and American shad have been specified as specific species of concern by MA DMF and therefore if available, the number of lengths taken will be 200 per trip. Two length frequency samples will be randomly selected, one during the first half and the second during the second half of the offloading period.

Below is MA DMF's description of the sampling protocol at a processing plant. The majority of sampling occurs at these types of off loading facilities for this project.

Processing Plant

Sampler should position himself at the discard vat where all bycatch and damaged fish are deposited. The sampler must position themselves in a location that is safe and will not disrupt plant operations. The name of the vessel should be recorded and hail weight, date landed, and general location fished (statistical area, known piece of bottom, etc.) should be collected from the plant manager or vessel captain. Hail weight should be confirmed after unloading process is complete and all fish have been processed. A processing rate (kg of catch processed/minute) should be calculated by dividing hail weight by the time it took to offload the vessel. When calculating time to off load catch, note time spent not pumping/processing, such as coffee or lunch breaks and processing hold-ups. To eliminate bias caused by periodicity, prior to the beginning of the offloading process, the sampler will use a random number table and pick a random start time between 1 and 30 minutes. Once the start time has been determined, a basket will be positioned in the discard vat and a sample will be collected. Once the basket has been filled, it will be weighed, sorted by species, and then weighed by species. Lengths will be collected according to NOAA Observer Program sampling protocols. This process will be repeated for thirty minutes until the sub-sampling period has been completed. If fish being sent to the bycatch vat is too abundant and sampler cannot weigh all fish being sent to the discard vat, then sub-sampling may be required to get an estimate of total bycatch per 30-minute sampling period. This sampling process will be repeated every other 30-minute interval during the entire pump offloading process. After the offload process, the sampler should consult with the plant's quality control personnel to obtain an accurate, by the box, quantification of species being processed. Lastly, to verify pump rates and landings estimates, the sampler should obtain a report of landings and processed fish from the plant manager after the off loading is complete.

2.3 PORTSIDE OBSERVATIONS BY ME DMR

For the ME DMR portside sampling program, the samplers collect and quantify all bycatch from individual lots of fish (transported by trucks or vessels) that enter the processing facilities. Samplers position themselves at the point of entry into the facility along an assembly line or at the base of the hoppers where the fish are unloaded. Sampling is conducted before grading or sorting of the catch occurs. All bycatch is removed from the assembly line or hopper and placed in bushel baskets or buckets specific to each species. The total weight of any observed bycatch is recorded along with species identification, total species weight, individual lengths and weights of all fish according to a NMFS and ACCSP specified protocol. If there is a large amount of one species, the total weight is recorded and then length frequencies and weight are gathered from a sub sample of n=50. The information collected for each bycatch study is recorded on the data sheets (see "Data Sheets" section of packet) and entered into the DMR biological database.

A sub-sampling protocol is sometimes utilized when sampling a large volume of catch. Instances where this is likely to occur include sampling sites where vessels land an entire catch (as much as one million pounds) to a single facility. Sub-sampling is also appropriate in instances when there is an overwhelming amount of bycatch and/or non targeted species mixed in with the lot of fish. In these cases it can be impossible to use the complete sampling protocol regardless of the amount inspected (< 80,000 lbs.). These situations are likely to occur when vessels are fishing mixed groups of herring and mackerel, some of which have a 50-50 composition.

Sub-samples are to be collected using bushel baskets at timed intervals during the pumping or unloading process following the NMFS at-sea observer sampling protocol. To accomplish this type of sub-sampling, one needs to know the total lot weight and the duration of time it will take to unload the catch. After sampling, the bushel basket of fish should be sorted by species, and total weight of each species and length frequencies should be recorded (sub sample n=50, for length frequencies if more than fifty of any species occurs).

Example:

Lot size = 120,000 lbs (3 Trucks)
Pumping or unloading time = 3 hours (180 minutes)

If a sample basket is to be collected for every 10,000 lbs of fish, then **12 sample baskets** need to be collected over the entire pumping or unloading process.

120,000 lbs/10,000 lbs = 12

If the entire pumping or unloading process takes an estimated 180 minutes, then **a basket sample needs to be taken every 15 mins.**

If the catch composition from the bushel baskets is 99% Atlantic Herring, then one can extrapolate that out of the 120,000 lbs unloaded, then 118,800lbs is Atlantic Herring.

99% Atlantic Herring = 120,000 lbs x 0.99 = 118,800lbs of Atlantic Herring

If the remaining 1% of the catch composition is Atlantic Mackerel, then one can extrapolate that out of the 120,000 lbs unloaded, 1,200lbs is Atlantic Mackerel

1% Atlantic Mackerel = 120,000lbs x 0.01 = 1,200lbs of Atlantic Mackerel

3.0 STATISTICAL ANALYSIS

For this analysis, data were gathered from the various projects by either request or direct querying of the data. In some cases, vessel trip report number was not available, and so trips between portside and at sea programs we matched by hand.

Several species were pooled into a species grouping because of potential for mis-identification or to make the analysis easier to understand. River herring group consisted of alewives, bluebacks and herring unknown were grouped as river herring. American shad and hickory shad were grouped as shad. Long-fin squid, short-fin squid and squid unknown were grouped as squid.

The analysis compares the number of occurrences of bycatch species by sampling method using a paired t-test. The binomial exact test was also used to check whether the probability of number of occurrence of bycatch in port sampling exceeding the number of occurrence in the observer sampling differed from 0.5.

The analysis compares the proportion of trips containing a particular species groups using Wald test with correction for continuity. Fisher's exact test was used to convert the differences into odds ratios. The test was conducted on the seven species groups with the highest percent occurrence: river herring, squid, silver hake, spiny dogfish, butterfish haddock, and shad. The family-wise error rate for multiple comparisons was not corrected.

The percent agreement for presence/ absence of species group was measured for both sampling methods using two indices of similarity. The first index was a simple matching index constructed by dividing the total the number of trips with joint presence and joint absence for both sampling methods by the total trips. In this index, joint absence (double zeros) contributes to similarity. However, the absence of a species group from both sampling methodology could be due to the trip occurring in an area or time where the species are not present, and inflating the index. To address joint absences, the Jaccard coefficient was used: the number of trips with joint presence divided by the number of trips with joint presence and the two unique combinations of present in one method and absent in the other. The joint absences do not contribute to similarity in the Jaccard index. This method was applied to seven species groups: river herring, squid, silver hake, spiny dogfish, butterfish, haddock and shad.

The relationship between the observer and portside estimates of landed weight of bycatch species was assessed using Pearson's product moment correlation coefficient. Agreement was tested between port and observer trip landings estimates using a paired t-test. T-tests were performed for all trips, trips without joint absences, and log transformed for trips without joint absences. Assumption that differences were distributed normally was assessed using quantile-quantile normal plots and Shapiro test for normality.

The following summarizes the PDT's questions and methodology for statistical evaluation of the portside/at-sea data:

1. **Is the frequency of detection of bycatch species similar for portside and observer program?**
    a. Paired T-test for number of occurrences for portside and observer
    b. Exact binomial test for the probability of occurrence portside versus observer
2. **Does the estimate of percent occurrence differ between sampling methods for each bycatch species?**
    a. Test difference in proportions among methods using Wald's statistic with correction for continuity
    b. Get odds ratio using Fisher's exact test
3. **Describe similarity of occurrence of species by tows**
    a. Matching index (% agreement)
    b. Jaccard index (% agreement excluding joint absence)
4. **Does the estimation of bycatch weight differ by method?**
    a. Correlation between paired estimates by method
    b. Paired T-tests for differences in trip estimates by sampling methodology
    c. Provide estimates of total weight of landed bycatch with 95% confidence interval for each method

4.0 PRELIMINARY RESULTS (WORK IN PROGRESS)

A total of 52 trips were sampled with both portside and at sea observer sampling between 2005 and 2009 (Table 1). The number of trips containing bycatch species groups by sampling methodology is shown in Table 2, and the number of trips as a proportion of total trips is shown in Table 5.

The number of occurrences of bycatch species by methodology (at-sea versus portside) was significantly different (Table 3). Port sampling averaged 1.9 more occurrences than the observer program. The exact binomial test indicated that the probability of a species occurring portside versus at sea was significantly greater than 0.5, suggesting non-random effects (Table 4).

For the seven most frequently caught bycatch species, the Herring PDT compared the proportion of trips with observed bycatch by methodology using Wald test statistic without adjustment for multiple comparisons (Table 6). Overall, the proportions of trips with a particular species were significantly different for squid and for spiny dogfish only, with the portside sampling method having higher proportions than the observer.

Similarity index for presence/ absence of species is presented in Table 7. Similarity indices were relatively high for the simple matching coefficient (mean: 0.72, range: 0.54 to 0.87), but tended to be low for the Jaccard coefficient (mean: 0.30, range: 0.17 to 0.54). The joint absences influence the similarity indices, and the true similarity is bounded by these two values. Further work needs to be done to separate joint absences that reflect no occurrences in strata where the species occur from joint absences in strata where the species in not likely to occur.

Scatterplots of paired portside and observer estimates for eight species are shown in Figure 1. The paired comparisons indicate little relationship between weight estimates from the Portside and Observer projects. Correlation coefficients for these eight species are exhibited in Table 8. The correlations coefficients for 7 of the 8 species were low and not significantly different from zero. Correlation coefficient was moderately high (0.80, 0.79) and significantly different from zero for spiny dogfish. The correlation coefficient was highly influenced by one trip where both methods had high estimates of catch. The correlation coefficient estimated without this pair was low and not significantly different from zero.

Bland-Altman plots of the paired landings estimate between methods are shown in Figure 2. Variation is high, and differences are larger as might be expected given the low correlation between observer and paired estimates. The distribution of paired differences was significantly different from normal and was strongly leptokurtic with more observations in the middle and tails for the full dataset and for the dataset without joint absences. Only shad with removal of trips with joint absence were not significantly different from normal. A Bland-Altman plot of the log-transformed dataset is shown in Figure 3. This dataset does not include the joint absences. Distribution of paired differences for log transformed data were not significantly different from normal except for spiny dogfish ($p<0.01$). Paired T-test results are provided in Table 9 and Table 10. No differences were significant for untransformed data, which is not surprising given the large variances. Paired differences were not significant for the log transformed data except for

spiny dogfish (0.02) and haddock (p=0.04). For non-significant tests, the confidence intervals were wide, indicating low power to detect differences. Spiny dogfish trip estimates from the observer sampling averaged 12% of the portside sampling estimates. Haddock trip estimates from the observer sampling averaged 5% of the portside sampling estimates.

Total estimates with 95% confidence intervals of landed catch by species and sampling method are shown in Table 11 and Table 12. Table 11 uses parametric statistic to derive 95% confidence interval and Table 12 uses bootstrap percentiles to estimate 95% confidence limits. These estimates were expanded using the trip estimates. They are only useful for comparing the estimates across sampling methods. As expected, confidence limits are wide. Note that estimates from the fishery would include stratification by month, area and gear types will improve precision.

5.0 PRELIMINARY CONCLUSIONS (WORK IN PROGRESS)

Portside and at sea sampling are two very different approaches to document bycatch in the directed Atlantic herring fish. During at-sea sampling observers have the ability to document discarded fish at sea and sample them. During portside operations, samplers cannot do so. However portside samplers have a much more stable platform, better working conditions and more time for a thorough examination.

The Herring PDT examined 52 trips which were sampled by both at sea and portside methods to test if both projects are similar in the amount and species composition detected. The PDT found large differences in retained bycatch between the two programs. More specifically, the portside sampling documented more occurrences of species, and a greater proportion of trips containing key bycatch species. However, at sea observation, when extrapolated to the entire retained weight, shows much higher weights of the more prevalent species. The lack of significant differences in many of the statically approaches taken here are a direct result of low sampling sizes. More co-occurring trips are needed by strata (gear type, sample mythology, area, quarter, and year) to detect significant differences; especially for species which occur infrequently in sampling. The analysis was further hampered by the number of co-occurring trips with either had no retained bycatch at all, or no bycatch of a particular species being tested.

It should be noted that the PDT is not suggesting one project or method is more useful or more accurate than the other. The PDT is, however, suggesting that pooling these two different methods of documenting bycatch may not be possible without further analysis and sampling. The PDT recommends a more thorough examination of both portside and at-sea observations to see if elucidation of these differences (and possible mathematical correction) is possible. By focusing on increasing the number of co-occurring trips statistical analysis may lead to increased comparability by analysis of the methods employed by both projects.

Summary of Herring PDT Conclusions to Date (Work in Progress)

1. Portside sampling method had more occurrences of bycatch than observer method. Proportion of occurrences in portside sampling is greater than at-sea observer sampling; and was significantly different from 0.5
2. The proportion of trips containing a bycatch species was not significantly different between Portside and Observer methods except for squid and spiny dogfish. Both of those species were significantly different
3. Relatively low levels of agreement of occurrences particularly with the Jaccard index.
4. No correlations between paired portside and observer trip estimates of weight
5. Paired T-test on log transformed estimates found no significant differences except for spiny dogfish and haddock. However, high variation in paired estimates lead to a loss of statistical power; and therefore the results cannot be taken as valid

Summary of Herring PDT Advice: Need to Examine Data to Find Sources of Variation (Work in Progress)

A. High variability in trip estimates in both the portside and observer sampling
B. Different methods for expanding within trip samples to trip estimates
C. Sampling design issues

Year	Quarter	Purse seine	Midwater trawl	Paired Midwater trawl
	1	0	0	3
	2	0	0	1
	3	1	0	2
2005	**4**	0	1	2
	1	0	0	0
	2	0	0	0
	3	0	1	1
2006	**4**	0	0	0
	1	0	0	1
	2	0	0	0
	3	0	0	0
2007	**4**	0	0	0
	1	0	1	2
	2	2	0	2
	3	3	0	1
2008	**4**	0	0	7
	1	0	0	4
	2	5	0	4
	3	3	0	4
2009	**4**	0	0	1
Total trips		14	3	35

Table 1 Count of trips sampled by both Portside and At Sea Observer Programs by gear type, year and quarter

Species Group	Purse seine		Midwater trawl		Paired Midwater trawl	
	Observer	Portside	Observer	Portside	Observer	Portside
River herring	**2**	**3**	**2**	**1**	**15**	**20**
Squid	**2**	**6**	**1**	**2**	**10**	**19**
Silver hake	**3**	**6**	**0**	**2**	**12**	**15**
Spiny dogfish	**4**	**8**	**0**	**2**	**4**	**14**
Butterfish	0	0	**1**	**0**	**5**	**9**
Haddock	0	0	**0**	**1**	**4**	**10**
Shad	0	0	**0**	**1**	**5**	**8**
Red hake	0	0	**0**	**1**	**0**	**6**
American plaice	**0**	**1**	**0**	**1**	**0**	**3**
Longhorn sculpin	**1**	**0**	0	0	**0**	**2**
Redfish	0	0	0	0	**1**	**2**
Cod	0	0	**0**	**1**	**0**	**1**
Fish unk	**1**	**0**	0	0	**1**	**0**
Lumpfish	**1**	**0**	0	0	**0**	**1**
Shrimp	**0**	**1**	0	0	**0**	**1**
Cunner	0	0	0	0	**1**	**0**
Cusk	0	0	**0**	**1**	0	0
Little skate	0	0	0	0	**0**	**1**
Menhaden	0	0	0	0	**0**	**1**
Pollock	0	0	0	0	**0**	**1**
Scup	0	0	0	0	**0**	**1**
Sea raven	0	0	0	0	**0**	**1**
Winter flounder	0	0	0	0	**0**	**1**
Number of trips	**14**	**14**	**3**	**3**	**35**	**35**

Table 2 Count of trips containing bycatch by species group, gear type and sampling program

Mean difference	95% confidence interval for mean difference	P-value	Degrees of Freedom
-1.9	-2.6 to -1.11	<0.001	41

Table 3 Summary of paired t-Test for number of occurrences of bycatch species by sampling methodology for in trips

Does not include trips with joint absence

Number of occurrences Port occurrences > observers	Proportion	95% confidence interval	Probability that Proportion is not different from 0.5
35	0.83	0.69-0.93	<0.001

Table 4 Summary for exact binomial test of number of occurrences of Port> Observer in number of occurrence of a bycatch species

Tests whether the true probability of Port occurrences > observer occurrences is not different from 0.5.

Species Group	Purse seine		Midwater trawl		Paired Midwater trawl	
	Observer	Portside	Observer	Portside	Observer	Portside
River herring	**0.14**	**0.21**	**0.67**	**0.33**	**0.43**	**0.57**
Squid	**0.14**	**0.43**	**0.33**	**0.67**	**0.29**	**0.54**
Silver hake	**0.21**	**0.43**	**0.00**	**0.67**	**0.34**	**0.43**
Spiny dogfish	**0.29**	**0.57**	**0.00**	**0.67**	**0.11**	**0.40**
Butterfish	0.00	0.00	**0.33**	**0.00**	**0.14**	**0.26**
Haddock	0.00	0.00	**0.00**	**0.33**	**0.11**	**0.29**
Shad	0.00	0.00	**0.00**	**0.33**	**0.14**	**0.23**
Red hake	0.00	0.00	**0.00**	**0.33**	**0.00**	**0.17**
American plaice	**0.00**	**0.07**	**0.00**	**0.33**	**0.00**	**0.09**
Longhorn sculpin	**0.07**	**0.00**	0.00	0.00	**0.00**	**0.06**
Redfish	0.00	0.00	0.00	0.00	**0.03**	**0.06**
Cod	0.00	0.00	**0.00**	**0.33**	**0.00**	**0.03**
Fish unk	**0.07**	**0.00**	0.00	0.00	**0.03**	**0.00**
Lumpfish	**0.07**	**0.00**	0.00	0.00	**0.00**	**0.03**
Shrimp	**0.00**	**0.07**	0.00	0.00	**0.00**	**0.03**
Cunner	0.00	0.00	0.00	0.00	**0.03**	**0.00**
Cusk	0.00	0.00	**0.00**	**0.33**	0.00	0.00
Little skate	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Menhaden	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Pollock	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Scup	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Sea raven	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Winter flounder	0.00	0.00	0.00	0.00	**0.00**	**0.03**
Number of trips	**14**	**14**	**3**	**3**	**35**	**35**

Table 5 Counts of trips with occurrence of bycatch as proportion of total trips by species group, gear type and sampling method

Species group	Port sampling Proportion	Observer Proportion	95% confidence interval on difference	Odds ratio	95% confidence interval on odds ratio	Probability of odds ratio
River herring	0.46	0.37	-0.11 - 0.30	1.48	0.63 - 3.52	0.42
Butterfish	0.17	0.12	-0.10 - 0.21	0.58	0.46 - 5.94	0.58
Squid	0.52	0.25	0.07 - 0.47	3.20	1.31 - 8.14	<0.01
Silver hake	0.44	0.29	-0.05 - 0.36	1.94	0.81 - 4.79	0.15
Spiny dogfish	0.46	0.15	0.12 - 0.49	5.08	1.72 - 13.71	<0.01
Haddock	0.21	0.08	-0.02 - 0.29	3.18	0.86 - 14.7	0.09
Shad	0.17	0.10	-0.72 - 0.23	1.95	0.54 - 8.03	0.39

Table 6 Comparing the differences in proportion of trips with species in observer and portside trips for all gear types

Test is two sided.

Species group		Observer sampling	+	-	Matching coefficient	Jaccard coefficient
River herring	Port	+	15	9	0.75	0.54
		-	4	24		
Butterfish	Port	+	4	5	0.87	0.36
		-	2	41		
Squid	Port	+	8	19	0.54	0.25
		-	5	20		
Silver hake	Port	+	9	14	0.62	0.31
		-	6	23		
Spiny dogfish	Port	+	6	18	0.62	0.23
		-	2	26		
Haddock	Port	+	3	8	0.83	0.25
		-	1	40		
Shad	Port	+	2	7	0.81	0.17
		-	3	40		

Table 7 Count of trips with species groups present (+) or absent (-) by sampling method and two measures of percent agreement between methods

Species group	All trips	Excludes trips with double-zeros.
River herring	-0.04	-0.13
Squid	0.06	-0.01
Silver hake	0.22	0.17
haddock	-0.02	-0.23
Spiny dogfish[1]	0.80	0.79
Spiny dogfish[2]	0.06	-0.08
Butterfish	0.25	0.12
Shad	-0.04	-0.30

Table 8 Pearson's product moment correlation coefficients for observer and portside estimates of landed weight

[1] Correlation coefficients are significantly different from 0 at P=0.05, but correlation coefficients are highly influenced by one trip.

[2] Removing influential points lowers correlation coefficients to not significantly different from zero.

Species group	Mean difference	95% Confidence interval for mean difference	P-value	Degrees of freedom
		All trips		
River herring	1242.9	-131.4 - 2,617.2	0.08	51
Squid	-4.3	-98.1 - 89.6	0.93	51
Silver hake	57.7	-176.1 - 291.6	0.62	51
Spiny dogfish	57.8	-94.7 - 210.4	0.45	51
Butterfish	-158.1	-480.2 - 164.0	0.33	51
Haddock	-22.2	-206.9 - 162.6	0.81	51
Shad	21.1	-39.9 - 82.2	0.49	51
		Without trips with joint absence (double zeros)		
River herring	2308.3	-248.5 - 4,865.1	0.07	27
Squid	-7.0	-162.9 - 148.9	0.93	31
Silver hake	103.5	-326.8 - 533.9	0.63	28
Spiny dogfish	118.0	-203.2 - 439.2	0.46	24
Butterfish	-747.3	-2,439.2 - 944.5	0.35	10
Haddock	-96.1	-1,002.2 - 809.9	0.82	11
Shad	91.6	-203.7 - 386.9	0.51	11

Table 9 Summary of paired T-test for estimates of trip catch by sampling method (observer-port)

Upper table uses all 52 trips. Bottom table does not include trips with joint absence.

Species group	Mean difference	95% Confidence interval for mean difference	P-value	Degrees of freedom
		All trips		
River herring	2.68	0.46 - 15.58	0.26	27
Squid	0.78	0.23 - 2.64	0.69	31
Silver hake	0.62	0.17 - 2.26	0.45	28
Spiny dogfish	0.12	0.02 - 0.68	0.02	24
Butterfish	1.21	0.15 - 9.80	0.84	10
Haddock	0.05	0.00 - 0.91	0.04	11
Shad	0.79	0.04 - 15.70	0.86	11

Table 10 Back-transformed summary of paired T-test for estimates of log trip catch by sampling method (observer-port)

Analysis does not include trips with joint absence by both sampling methods. Back transformed values are ratio of observer estimate to port sampling estimate.

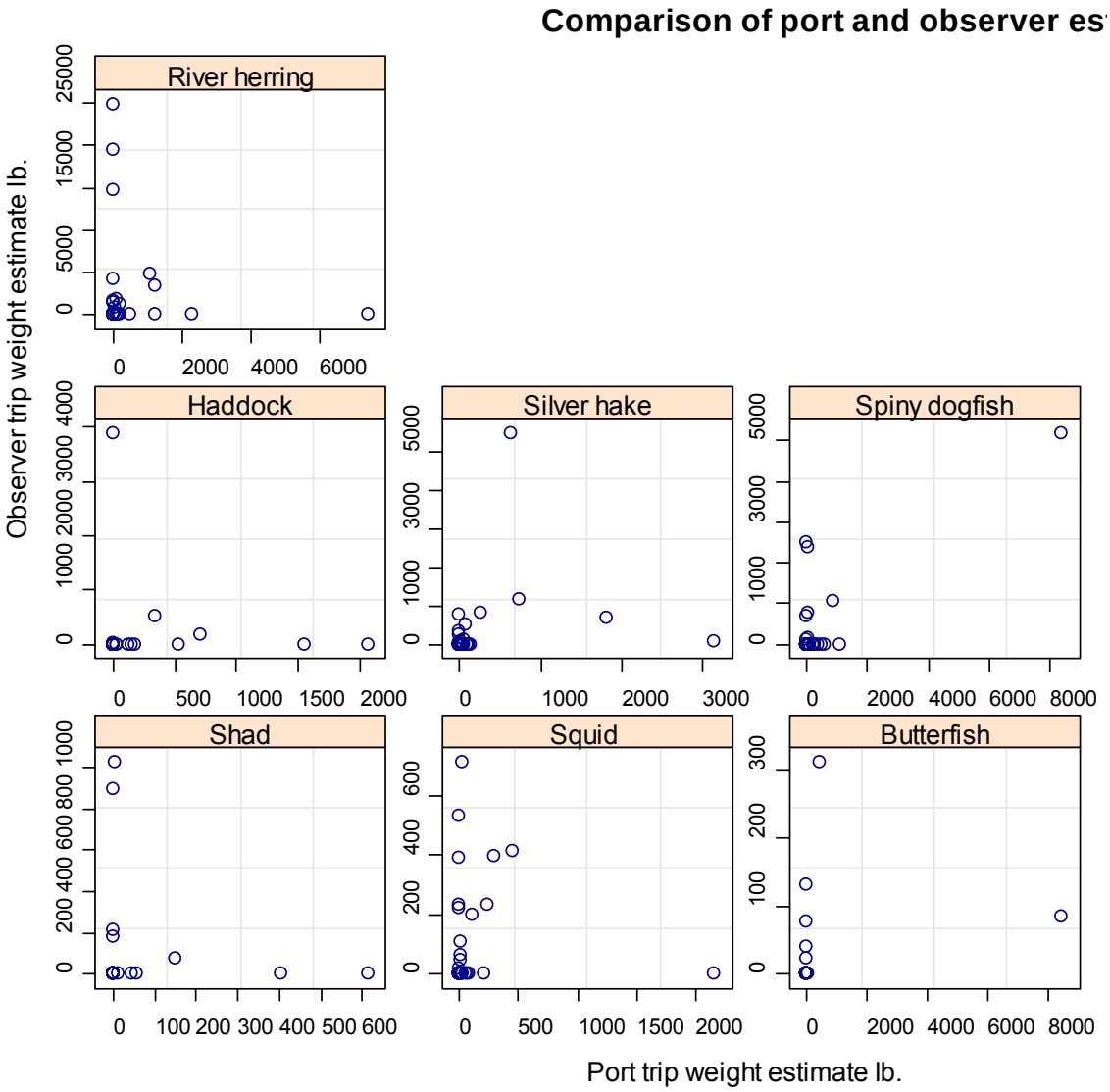


Figure 1 Scatterplot of Observer weight against Portside weight

Note that x and y scales differ among panels.
Plot includes estimates where both port and observer estimates are zero.

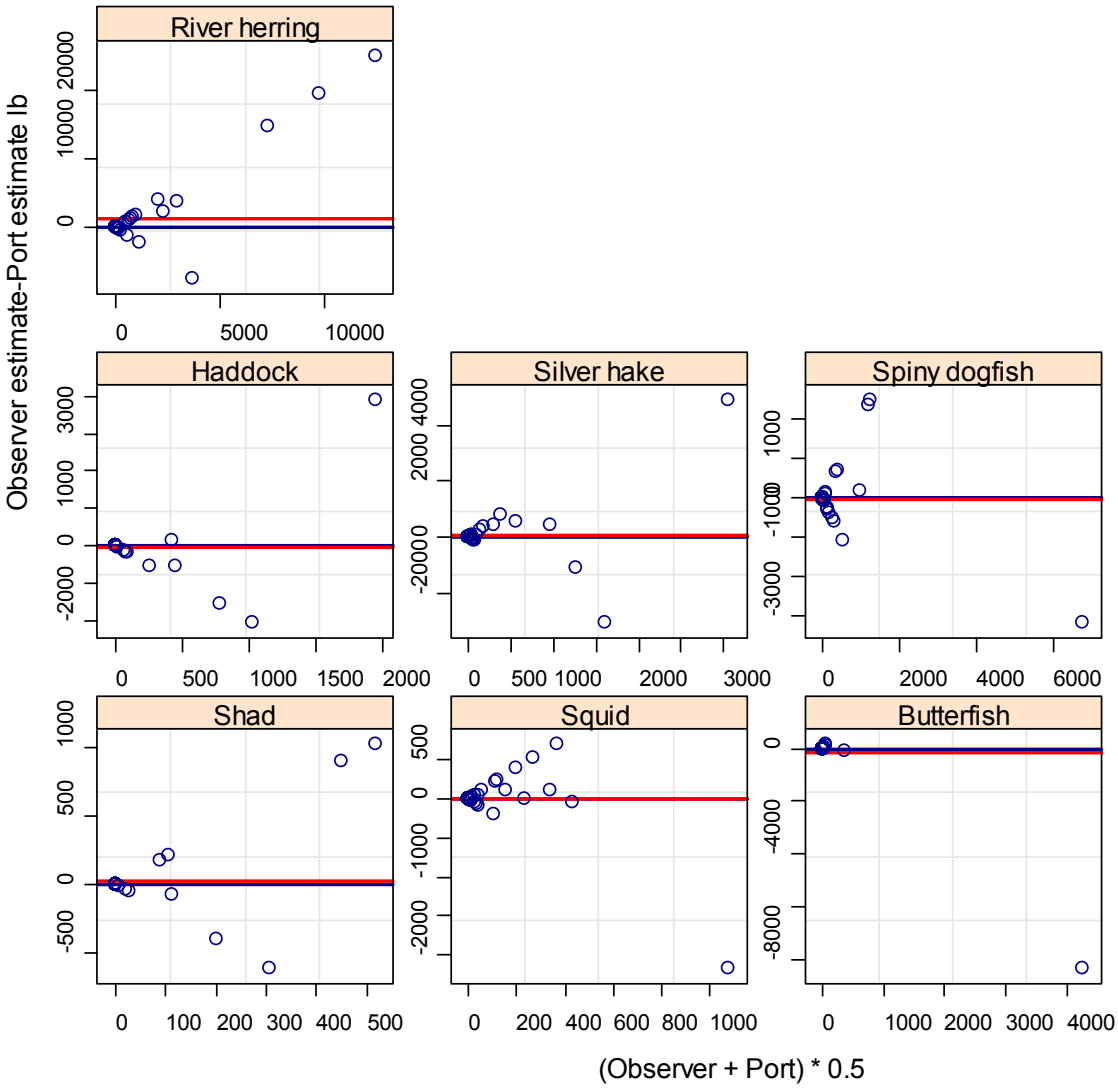


Figure 2 Bland-Altman plot of paired estimates of landings

Redline is average difference. Blue line indicates 0. Dataset includes all trips including joint absence.

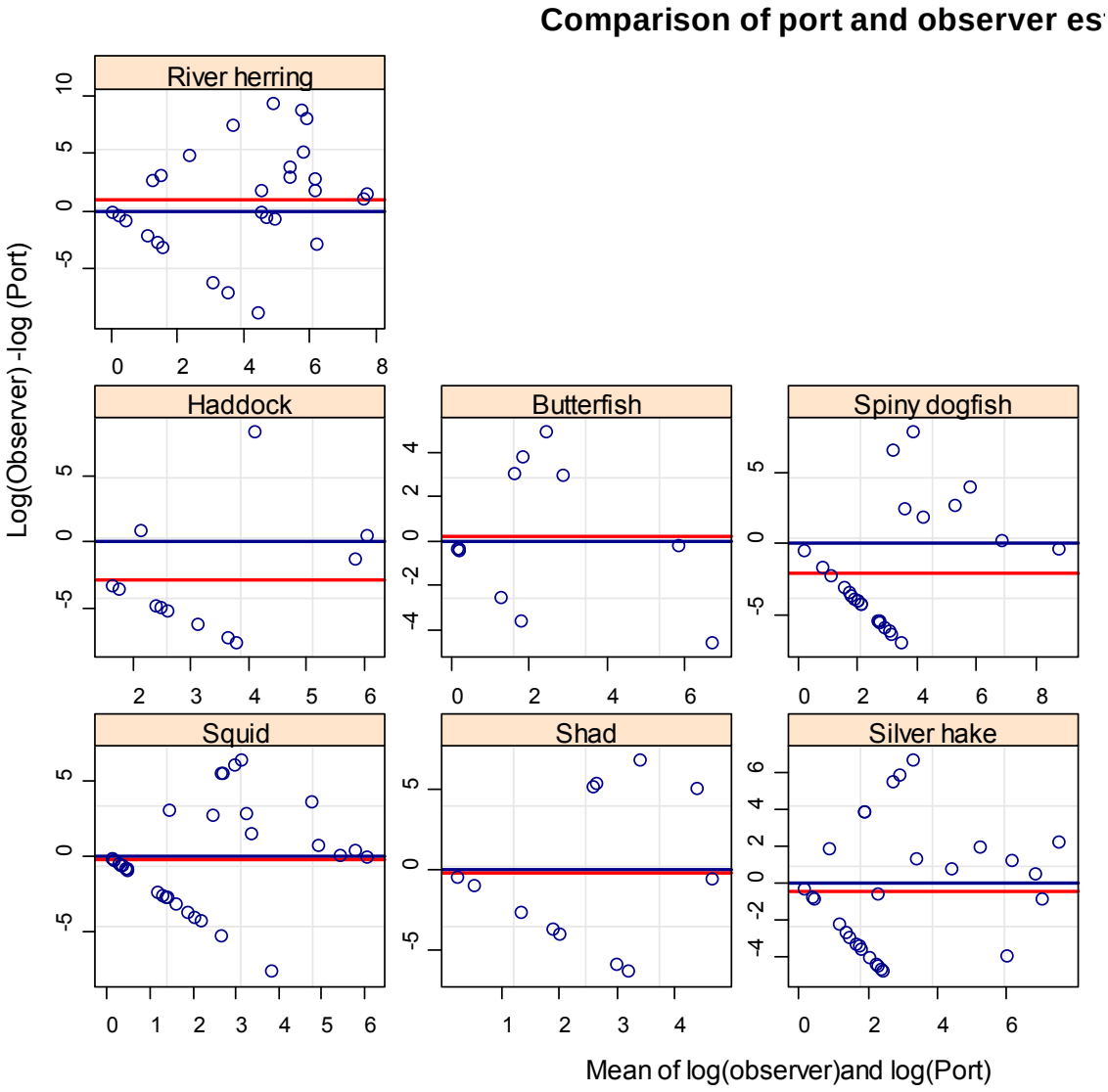


Figure 3 Bland-Altman plot of paired estimates of log landings

Redline is average difference. Blue line indicates 0. Dataset does not include trips with joint absence.

Species grouping	Total portside estimate (lb)	95% confidence interval		Total observer estimate lb	95% confidence interval	
Fish unk	0	0	0	100,000	-64,784	264,784
River herring	14,695	-1,030	30,420	79,327	10,313	148,341
Spiny dogfish	13,076	-3,821	29,973	12,852	379	25,325
Silver hake	7,372	5	14,739	10,375	-1,057	21,806
Haddock	5,743	364	11,122	4,590	-3,264	12,443
Butterfish	8,888	-8,023	25,798	667	-39	1,373
Squid	3,769	-687	8,225	3,546	1,295	5,797
Cunner	0			4,864	-4,901	14,629
Shad	1,288	-193	2,769	2,387	-359	5,133
Scup	1,667	-1,679	5,012	0		
Redfish	43	-38	124	210	-212	632
Red hake	238	-36	512	0		
Pollock	160	-161	482	0		
Longhorn sculpin	6	-5	17	54	-54	162
American plaice	35	-5	76	0		
Cod	17	-7	41	0		
Lumpfish	9	-9	27	6	-6	18
Winter flounder	12	-12	36	0		
Shrimp	4	-4	12	0		
Menhaden	3	-4	11	0		
Sea Raven	3	-3	10	0		
Cusk	3	-3	8	0		
Little skate	2	-2	5	0		

Table 11 Estimates of total landings in weight with 95% confidence intervals derived from Observer and Portside sampling for 52 trips

Total Estimate based on expansion of mean landings per individual trip.

Species grouping	Total portside estimate (lb)	95% confidence interval		Total observer estimate lb	95% confidence interval	
Fish unk	0			100,000	0	280,020
River herring	14,695	3,250	32,614	79,331	23,348	154,440
Spiny dogfish	13,076	2,777	36,156	12,849	2,621	26,140
Silver hake	7,372	1,560	15,220	10,375	2,444	23,322
Haddock	5,743	1,243	11,627	4,590	12	13,055
Butterfish	10,375	16	26,083	667	132	1,452
Squid	3,770	760	9,282	3,546	1,550	5,793
Cunner	0	0	0	4,864	0	14,592
Shad	1,288	142	3,124	2387	176	5,514
Scup	1,667	0	5,000	0		
Redfish	43	0	129	0		
Red hake	238	38	541	0		
Pollock	160	0	481	0		
Longhorn sculpin	6	0	21	54	0	162
American plaice	35	3	83	0		
Cod	17	0	46	0		
Lumpfish	9	0	27	6	0	24
Winter flounder	12	0	36	0		
Shrimp	4	0	12	0		
Menhaden	3	0	10	0		
Sea Raven	3	0	10	0		
Cusk	3	0	8	0		
Little skate	2	0	5	0		

Table 12 Estimates of total landings in weight with 95% confidence intervals based on bootstrap percentiles derived from Observer and Portside sampling for 52 trips

Total Estimate based on expansion of mean landings per individual trip.

Set type	species	r	95% confidence interval		P-value	Bootstrap problem indicator	95% confidence interval based on bootstrap	
All pairs	River herring	-0.04	-0.31	0.23	0.75		-0.11	0.19
Non-zero pairs	River herring	-0.13	-0.48	0.26	0.52		-0.37	0.98
All pairs	Squid	0.06	-0.22	0.32	0.70	B	-0.48	0.264
Non-zero pairs	Squid	-0.01	-0.36	0.34	0.95		-0.17	0.6196
All pairs	Silver hake	0.22	-0.06	0.47	0.12	B	0.04	0.91
Non-zero pairs	Silver hake	0.17	-0.21	0.51	0.37	B	-0.03	0.91
All pairs	Spiny dogfish[1]	0.80	0.68	0.88	<0.001	B	-0.10	0.98
Non-zero pairs	spiny dogfish[1]	0.79	-0.45	0.32	0.70	B	-0.27	0.98
All pairs	Butterfish-all	0.25	-0.03	0.49	0.08	B	-0.04	0.99
Non-zero pairs	Butterfish-pos	0.12	-0.51	0.67	0.72	B	-0.37	0.98
All pairs	Haddock	-0.02	-0.29	0.25	0.89	B,S	-0.08	0.64
Non-zero pairs	Haddock	-0.23	-0.71	0.40	0.47	B,S	-0.48	0.26

Table 13 Pearson's product moment Correlation coefficients, 95% confidence interval and 95% confidence interval from bootstrap for paired catches

[1.] Correlation coefficients are significantly different from 0 at P=0.05, but correlation coefficients are highly influenced by one trip.

[2] Removing influential points lowers correlation coefficients to not significantly different from zero. Bootstrap indicator: B= high bias, A= some bootstrap samples had zero standard deviations.

A comparison of portside and at-sea sampling methods of estimating bycatch in the Atlantic herring fishery

Micah Dean
Herring PDT
May 2011



Introduction

There are three primary gear types used to target Atlantic herring in the United States: bottom trawls, midwater trawls and purse seines (Table 1). Estimates of bycatch in this fishery are primarily derived from data collected at-sea under the Northeast Fisheries Observer Program (NEFOP). On bottom trawl vessels, bycatch species are typically sorted from the catch on deck and are discarded at sea. NEFOP samplers often achieve a census of the bycatch before it is thrown overboard and as a result there is essentially no variance surrounding the estimate of bycatch on a trip. The other two gear types are considered "high-volume" fisheries and bycatch species usually remain mixed with the catch as it is pumped from the net to the hold, as it is impractical to sort through such large catches at sea. As such, sea samplers estimate bycatch by taking a systematic sample of the catch as it is pumped onboard. While this method of sampling provides a less precise estimate of bycatch than a census of discards, the fact that bycatch species are retained presents an opportunity to also sample the catch when it is offloaded at port.

Table 1. Average trip information for vessels participating* in the Atlantic herring fishery in 2010, as reported to the National Marine Fisheries Services (NMFS) on Vessel Trip Reports (VTRs).

Gear Type	Total number of trips	Median catch per trip (Kg all species)	Median tows per trip	Median trip length (days)
Purse seine	163	31,752	2	1
Midwater trawl	350	145,423	2	3
Bottom trawl	207	2,472	3	1

** vessels with A,B,C or D herring permits not declared out of the fishery via VMS.*

In an effort to increase the number of trips sampled and thereby reduce the uncertainty surrounding fishery-wide estimates of bycatch, portside sampling programs have been initiated in Massachusetts and Maine. An obvious prerequisite to combining these portside and sea-sampling data is the comparability of the sampling programs. An initial comparison found relatively poor agreement between the two methods and raised concerns over the ability of either program to estimate bycatch in this fishery (Appendix A). The objective of this report is to explain the source of this previous disagreement, and to provide an updated comparison of the different programs. At-sea and portside sampling protocols were compared using a simulation model as well as with empirical data from herring trips sampled under both programs. This comparison focuses on midwater trawl vessels, as they present the greater challenge in sampling at-sea would therefore benefit the most from additional portside sampled trips.

Methods

Simulation

The contents of a typical, yet simplified hold of a midwater trawl herring vessel were simulated in the R software package by assembling an array of individual fish caught from three tows, totaling 150 mt in weight. The tows were of equal size (50 mt), but to evaluate the sensitivity of each sampling protocol to non-randomly distributed bycatch, two different scenarios were evaluated: 1) similar bycatch per tow and 2) dissimilar bycatch per tow. To simplify the comparison between protocols, the simulated hold contained only 3 species: Atlantic herring (target species), river herring[1] (higher abundance bycatch species) and whiting (lower abundance bycatch species). The hold under each scenario contained a similar amount of each species and differed only in the concentration of bycatch species in each tow (Table 2).

Table 2. Percent of target and bycatch species by weight in each tow under each simulation scenario.

Similar Tows Scenario

	Atlantic herring	river herring	whiting
Tow 1	98.9%	1.0%	0.1%
Tow 2	98.9%	1.0%	0.1%
Tow 3	98.9%	1.0%	0.1%
Total	98.9%	1.0%	0.1%

Dissimilar Tows Scenario

	Atlantic herring	river herring	whiting
Tow 1	99.89%	0.10%	0.01%
Tow 2	97.40%	2.40%	0.24%
Tow 3	99.41%	0.50%	0.05%
Total	98.9%	1.0%	0.1%

The number of individuals of each species (n_s) in a given tow was determined by multiplying the percent contribution of that species (p_s) by the weight of the tow (w_{tow}), and dividing by the average individual size ($\overline{w}_s$ - Figure 1).

[1] For the purposes of estimating bycatch in the Atlantic herring fishery, alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) are typically grouped together and referred to as "river herring."

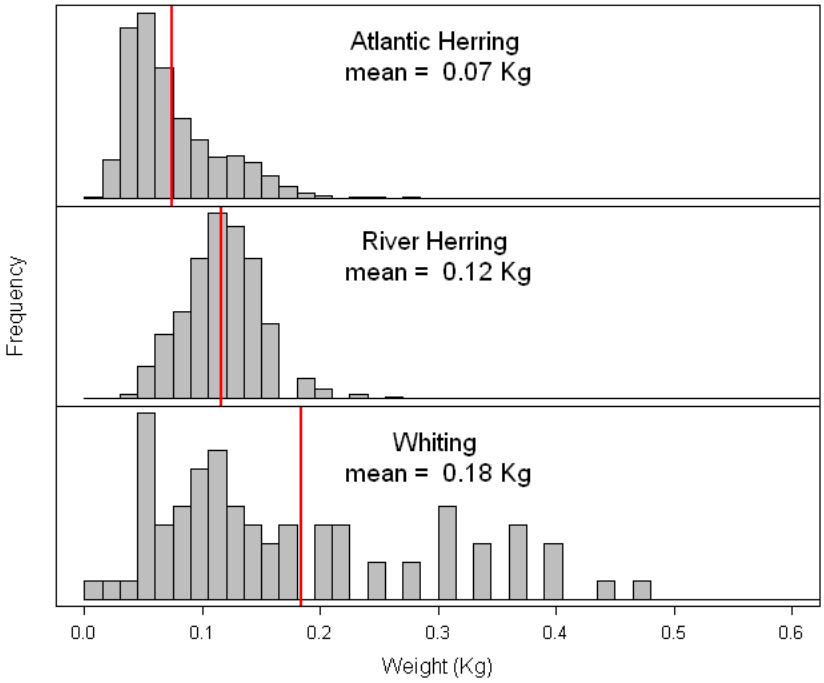


Figure 1. Frequency distributions of individual fish weights from observed herring trips in 2010.

A tow was represented by creating an array of individual fish of length n_{tow} ($\sum n_s$). For each bycatch species, a random sample of n_s individuals was selected from this array and designated as species s. The remaining individuals were designated as the target species, Atlantic herring. Individual fish were assigned random weights by sampling with replacement from the distribution of weights observed at-sea in 2010 for that species (Figure 1). The three tow arrays were joined into a single array to represent the hold. The bycatch distribution from each tow was kept intact when assembled into the hold array (i.e. no mixing) to mimic the process of pumping each tow's catch into a separate tank onboard the vessel. The total weight of each bycatch species was estimated by sampling from the hold array using four different protocols: 1) at-sea sampling: (AS) 2) portside unsorted sampling: (PU) 3) portside sorted sampling: (PS) and 4) portside lot sampling: (PL).

At-Sea Sampling (AS)

In high-volume fisheries, at-sea samplers typically take a systematic sample of 10 "baskets" from each tow to describe the species composition of the catch. The contents of each ~30 kg basket are sorted by species and weighed. The proportion of each species from the basket sample is then multiplied by the captain's estimate of tow size to achieve the amount of each species per tow. The total amount of bycatch for the trip is the sum of the bycatch estimates from each tow (Table 3). This sampling process was simulated by taking a systematic sample of 10 individuals from each tow array, with a random starting point. Each selected individual represented the beginning of a basket, and every fish

following the initial one was added to the basket until the weight of the basket exceeded 30 kg.

Portside Unsorted Sampling (PU)
During the offload process, vessels typically pump their catch through a "de-watering box" as it is transferred from the hold to trucks or vats onshore. Portside samplers take a systematic basket sample of the catch as it is pumped through the de-watering box. In this case, the sampling interval is determined by the amount of time required to sort and weigh the contents of a basket, which on average is about seven minutes. Since the amount of time required to offload a vessel can be 24 or more hours, samplers take occasional breaks from sampling and are typically working for approximately 75% of the pumpout. The total amount of each bycatch species from the basket sample is expanded to the entire hold using the captain's estimate of the trip size (Table 3). This sampling protocol was simulated in a manner similar to the method of creating baskets under the AS protocol; However, in this case a single systematic sample of 32 baskets was taken from the hold array, based on an estimated 5 hour pumpout for a trip of this size (5 hours x 75% sampling time / 7 min per basket = 32 baskets).

Portside Sorted Sampling (PS)
The majority of Atlantic herring landings are sold as bait for the American lobster fishery, and as such are typically transferred directly from vessels to waiting trucks or vats. Alternatively, some herring are packaged, frozen and sold as food, often in international markets. Herring destined to be food are pumped from the vessel onto a conveyor belt at a shoreside facility where as many as 8 to 12 personnel (i.e. "pickers") separate bycatch species from the catch prior to packaging. The bycatch, as well as any damaged Atlantic herring, are sent to a central vat via a series of chutes. Portside samplers systematically sample the flow of bycatch to this vat via baskets in a manner similar to unsorted sampling. However, since the bycatch is more concentrated at this sampling location, processing the basket contents is more laborious and the average sampling interval is approximately 15 minutes. Likewise, samplers often take longer breaks and are working for approximately 50% of the pumpout. The total amount of each bycatch species from the basket sample is expanded to the entire hold using the total amount of bycatch (and damaged Atlantic herring) sorted to the vat (Table 3). To simulate this protocol, 5% of the target species in the hold array were randomly designated as damaged. The bycatch vat was represented by extracting a subset of the hold array that contained all bycatch species and damaged Atlantic herring, maintaining the original order from the hold array. A single 10-basket systematic sample from this vat array was taken, using the method described under the AS protocol (5 hours x 50% sampling time / 15 min per basket = 10 baskets).

Portside Lot Sampling (PL)
Herring that are sold as lobster bait are often pumped directly into trucks and driven over land to dealers in Maine. When it is not possible for portside samplers to intercept and sample the vessel during the pumpout, the contents of bait trucks are often sampled as they are unloaded at the retail dealer in Maine. In this case, a systematic sample of

baskets is taken from the contents of the truck as it is emptied. Typically, 1-3 trucks from a vessel are sampled and together are referred to as a "lot." On average, a 16-basket sample is taken from each truck. The total amount of bycatch from a trip is calculated by expanding the basket sample first to the entire lot, and then from the lot to the entire hold (Table 3). At times, conditions permit sorting all bycatch species from the lot as it is offloaded. In these cases, a census of bycatch from the lot is achieved. However, to simplify the comparison with other protocols, the systematic basket-sampling approach was used to represent PL sampling in the simulation. The hold array was broken up into eight sections to represent individual trucks, two of which were randomly selected for sampling. A 16-basket systematic sample was made from each selected truck, using the method described under the AS protocol.

A total of 1,000 iterations of each sampling protocol were made from the simulated hold under each scenario. The distribution of bycatch estimates from all sampling iterations was used to describe the accuracy and precision of each protocol. The mean estimate and coefficient of variation (CV) for each bycatch species were compared across the four protocols and two scenarios

A second simulation experiment was conducted to illustrate the effect of sample size and bycatch rarity on the precision of bycatch estimates as well as the ability to detect a bycatch species. In this case, a hold was simulated that contained four randomly-distributed bycatch species at various densities (1%, 0.1%, 0.05%, and 0.01%). A single systematic sample with random starting point was taken from this hold at various sample sizes (10, 25, 50 and 100 baskets). This sampling routine was iterated 1000 times, and the CV of the estimates, as well as the percent of estimates that were zero were compared.

Table 3.

Sampling protocol	Method used to estimate bycatch and variance
At-Sea Sampling (AS)	$r_{s,tow} = \frac{\sum w_{s,i}}{\sum w_i}$ $w_{s,tow} = r_{s,tow} w_{tow}$ $w_s = \sum w_{s,tow}$ $V(w_{s,tow}) = N^2 \left(\frac{N-n}{N} \right) \left(\frac{s^2}{n} \right)$ $s^2 = \frac{\sum (w_{s,i} - r_{s,tow} w_i)^2}{n-1}$ $V(w_s) = \sum V(w_{s,tow})$ Where, $r_{s,tow}$ = ratio of species s in tow $w_{s,i}$ = weight of species s from basket i $w_{s,tow}$ = weight of species s from tow w_s = weight of species s in the hold w_i = weight of basket i N = number of possible baskets from tow n = number baskets sampled from tow
Portside Unsorted (PU)	$w_s = \frac{N}{n} \sum w_{s,i}$ $V(w_s) = N^2 \left(\frac{N-n}{N} \right) \left(\frac{s^2}{n} \right)$ Where, w_s = weight of species s in the hold $w_{s,i}$ = weight of species s from basket i N = number of possible baskets from hold n = number of baskets sampled from hold s^2 = sample variance of species s from baskets
Portside Sorted (PS)	$w_s = \frac{N}{n} \sum w_{s,i}$ $V(w_s) = N^2 \left(\frac{N-n}{N} \right) \left(\frac{s^2}{n} \right)$ Where, w_s = weight of species s in the hold $w_{s,i}$ = weight of species s from basket i N = number of possible baskets from bycatch vat n = number baskets sampled from bycatch vat s^2 = sample variance of species s from baskets
Portside Lot (PL)	$w_{s,lot} = \frac{N}{n} \sum w_{s,i}$ $w_s = \left(\frac{M}{m} \right) w_{s,lot}$ $V(w_{s,lot}) = N^2 \left(\frac{N-n}{N} \right) \left(\frac{s^2}{n} \right)$ $V(w_s) = \left(\frac{M}{m} \right)^2 V(w_{s,lot})$ Where, w_s = weight of species s in the hold $w_{s,i}$ = weight of species s from basket i N = number of possible baskets in lot n = number of baskets sampled from lot M = number of possible trucks from hold m = number of trucks sampled from hold s^2 = sample variance of species s from baskets

Empirical Data
A total of 30 midwater-trawl herring trips from 2010-2011 were identified as being sampled by both at-sea and portside methods. Twenty-four trips were sampled by PU methods and six trips were sampled by PS methods. Five trips were sampled by more than one portside method (PU and PL). Estimates of bycatch for six common species (river herring, whiting, American shad, butterfish, haddock and spiny dogfish) were calculated for each trip and compared across sampling methods. The variability of the bycatch observed in the basket sample data was used to estimate the variance surrounding the bycatch estimate for each trip (Table 3). The amount of agreement between at-sea sampling and port sampling was evaluated in two different ways: 1) the ability to detect bycatch species (i.e. presence-absence) and 2) significant differences in bycatch estimates.

There are four possible outcomes when comparing two sampling protocols' ability to detect a bycatch species: 1) present in both (++); 2) present in neither (--); 3) present in portside sampling, absent from sea sampling (P+); and 4) present in sea sampling, absent from portside sampling (S+). For each of the six species, a matching coefficient was calculated by dividing the number of trips that fell into the first two categories (++,--) by the total number of trips sampled. Because some species are infrequently encountered by this fishery, a high proportion of "double negative" (--) trips could yield an unrealistically high matching coefficient. To account for this, a second matching coefficient was calculated that omits the "--" trips from both the numerator and denominator.

A modified two sample *t*-test assuming unequal variances (i.e. Welch's test) was used to test for a significant difference ($\alpha = 0.05$) between portside and at-sea sampling estimates of bycatch. This test typically relies on the sample means ($\bar{x}$) and sample variances (s^2) to calculate the *t* statistic:

Eq. 2) $$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

However, since we are comparing a variety of protocols with different *types* of samples (e.g. sorted vs unsorted), the sample means and variances were replaced with the total estimated bycatch per trip (*w*), and the variance of those estimates (*V(w)*):

Eq. 3) $$t = \frac{w_1 - w_2}{\sqrt{V(w_1) + V(w_2)}}$$

To evaluate how often bycatch is non-randomly distributed in the catch, a one-sided "runs" test was performed on the series of basket observations for a single species (river herring) for each sampled trip. This test relies on the calculation of an expected number of "runs" given the number of observations at two levels, a "run" being a sequence of

adjacent observations at the same level. In this case, the two levels were defined as: 1) above the mean value and 2) below the mean value. If the number of observed runs for a trip was significantly lower than the expected value ($\alpha = 0.05$), it was considered to have non-randomly distributed bycatch.

Results

Simulation

AS, PU and PL sampling achieved comparable levels of precision under the similar tows scenario, with a CV of approximately 0.1 for river herring and 0.6 for whiting (Figure 2). PS sampling was identified as being the most precise, with a CV roughly half of the other protocols. AS, PU and PS sampling performed equally well under the dissimilar tows scenario, indicating these protocols are robust to non-random distributions of bycatch (Figure 3). On the other hand, PL sampling performed very poorly under the dissimilar tows scenario, yielding a CV of 0.59 for river herring (a 500% increase) and a CV of 0.91 for whiting (an 80% increase). Additionally, the PL protocol failed to detect any of the less abundant whiting 9% of the time under the dissimilar tows scenario. None of the protocols were found to be biased, achieving mean estimates within 3% of the true value under either scenario.

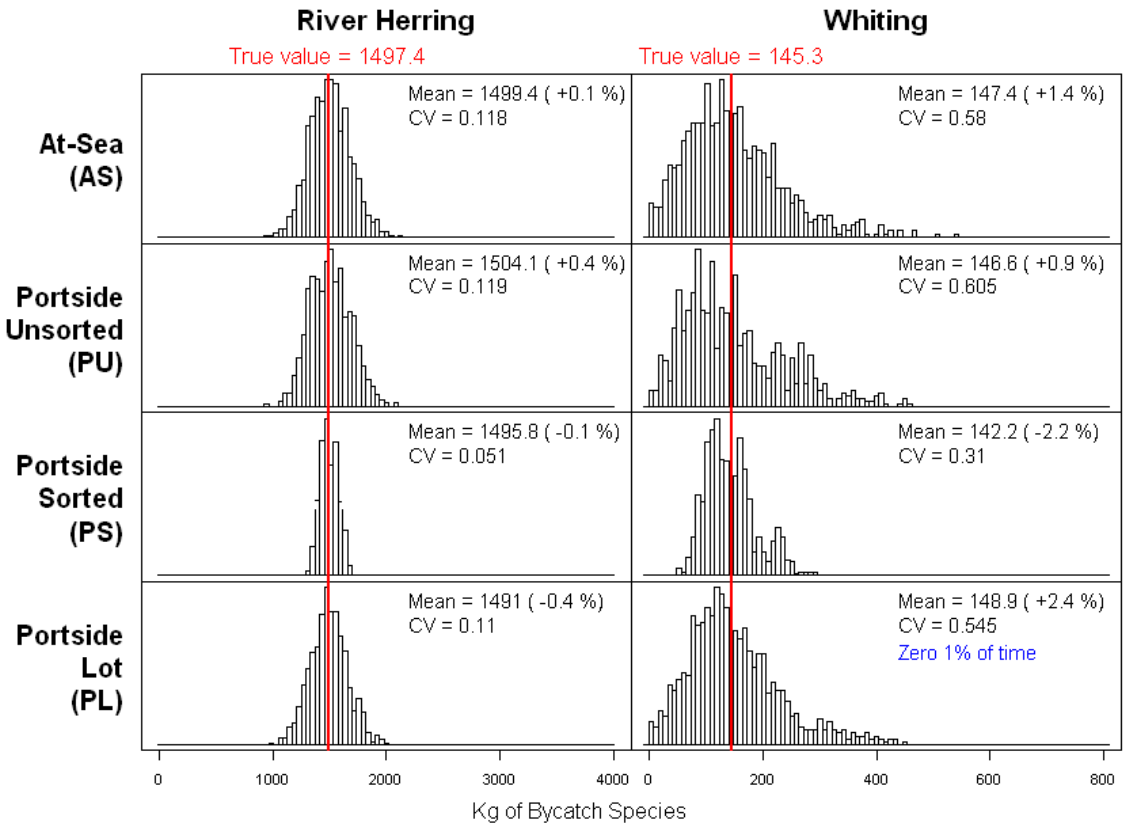


Figure 2. Distribution of bycatch estimates from 1000 iterations of sampling the simulated hold under the similar tows scenario.

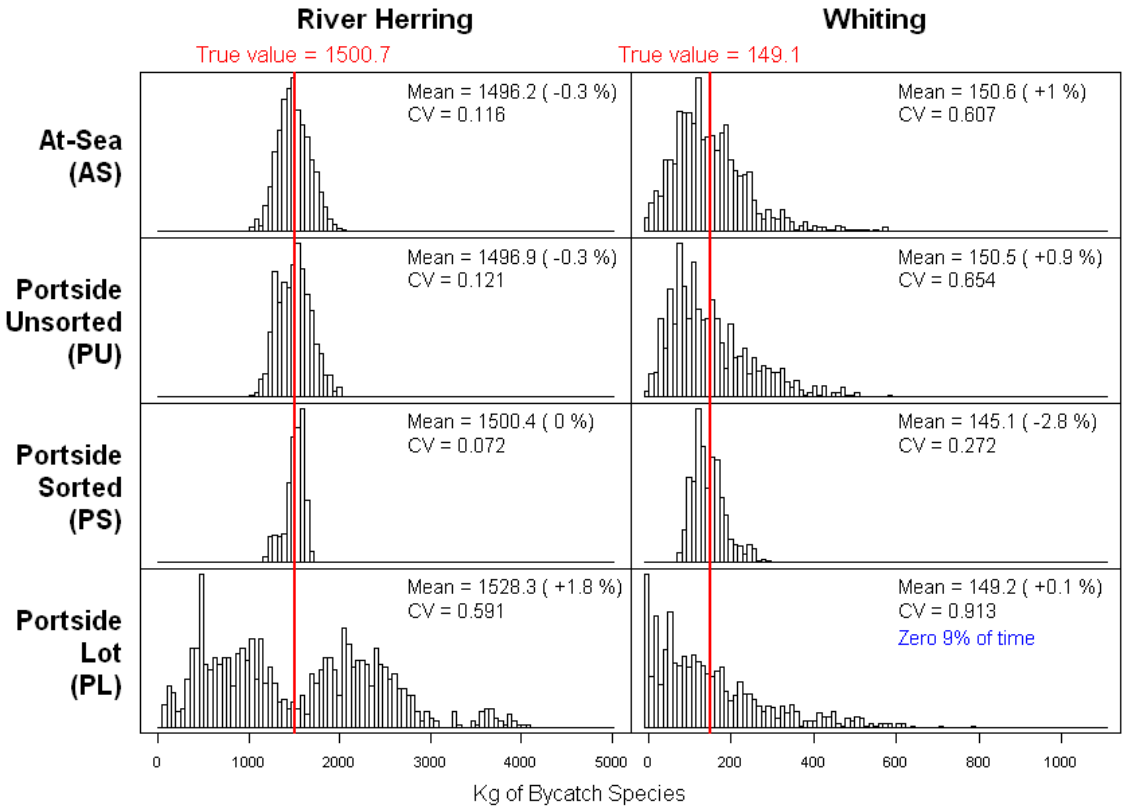


Figure 3. Distribution of bycatch estimates from 1000 iterations of sampling the simulated hold under the dissimilar tows scenario.

For the second simulation experiment, results indicated that both sample size and bycatch rarity have a strong influence on the precision of the estimate and the ability to detect bycatch species (Figure 4). For all levels of bycatch rarity, the CV of the estimate increased by a factor of 3 when the sample size was dropped from 100 baskets to 10 baskets. Likewise, the CV of the estimate increased by a factor of 10 when the rarity of the bycatch dropped from 1% of the catch to 0.01%. The ability to detect the rarest bycatch was very low at the smallest sample size, with 71% of the sampling iterations failing to detect a single bycatch individual.

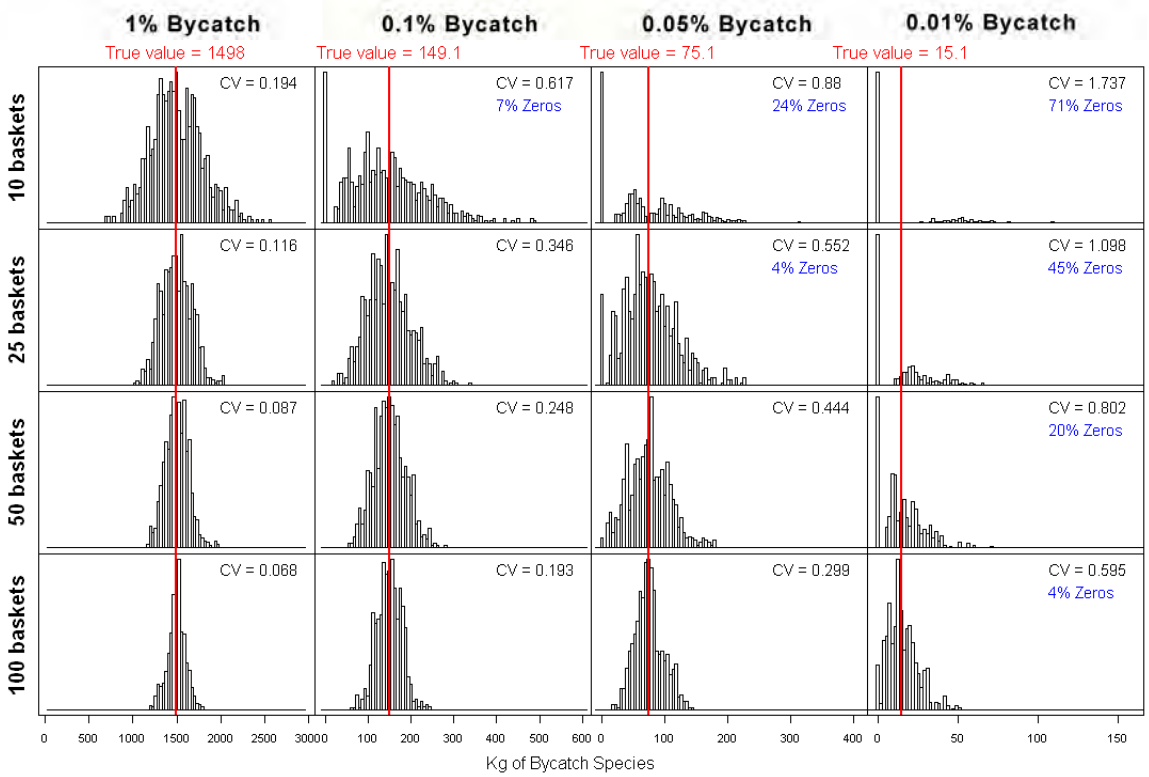


Figure 4. Distribution of bycatch estimates at four levels of bycatch rarity from 1000 iterations of a single systematic sample of various sizes.

Empirical Data

PU sampling achieved a 75% to 92% agreement with AS in the ability to detect the six bycatch species (Table 4). When the "double negative" (--) tows were omitted, the amount of agreement dropped substantially for some species (e.g. spiny dogfish, butterfish), yet remained high for others (e.g. river herring, silver hake). The *amount* of bycatch estimated also agreed well between PU and AS sampling. For the six species considered, significant differences in bycatch amount were detected on only 8 to 25% of the trips (75 to 92% agreement). All of these significant differences resulted from one protocol "missing" the bycatch species (i.e. P+ or S+).

Table 4. Number of trips that detected bycatch species under PU and AS and the percent agreement between the two protocols (top). Number of trips with a significant difference (alpha = 0.05) in bycatch amount of six species, between AS and PU methods (bottom).

Presence-Absence

	Agree		Disagree			
	++	- -	P+	S+	% Agree	% Agree (omit --)
River Herring	18	3	1	2	88%	86%
Butterfish	5	15	3	1	83%	56%
Silver Hake	12	9	1	2	88%	80%
Spiny Dogfish	2	19	3	0	88%	40%
Haddock	6	16	2	0	92%	75%
American Shad	7	11	4	2	75%	54%

Significant Differences

	No Sig Diff		Sig Diff				
	++	- -	++	P+	S+	% No Sig Diff	% No Sig Diff (omit --)
River Herring	18	3	0	1	2	88%	86%
Butterfish	5	15	0	3	1	83%	56%
Silver Hake	12	9	0	1	2	88%	80%
Spiny Dogfish	2	19	0	3	0	88%	40%
Haddock	6	16	0	2	0	92%	75%
American Shad	7	11	0	4	2	75%	54%

PS sampling achieved 50% to 83% agreement with AS in the detection of bycatch species (Table 5). However, for some species the agreement dropped to 0% when "--" trips were omitted (i.e. spiny dogfish, haddock). In terms of the quantity of bycatch estimated, PS sampling had limited agreement with AS sampling: 33%-83% of the trips sampled had significant differences between the protocols (17%-67% agreement). However, much of that agreement came from "double negative" trips and once they were removed, the amount of agreement dropped to 0%-50%.

Table 5. Number of trips that detected bycatch species under PS and AS and the percent agreement between the two protocols (top). Number of trips with a significant difference (alpha = 0.05) in bycatch amount of six species, between AS and PS methods (bottom).

Presence-Absence

	Agree		Disagree			% Agree (omit --)
	++	- -	P+	S+	% Agree	
River Herring	5	0	1	0	83%	83%
Butterfish	2	2	2	0	67%	50%
Silver Hake	4	0	2	0	67%	67%
Spiny Dogfish	0	3	3	0	50%	0%
Haddock	0	4	2	0	67%	0%
American Shad	3	0	3	0	50%	50%

Significant Differences

	No Sig Diff		Sig Diff			% No Sig Diff	% No Sig Diff (omit --)
	++	- -	++	P+	S+		
River Herring	2	0	3	1	0	33%	33%
Butterfish	1	2	1	2	0	50%	25%
Silver Hake	1	0	3	2	0	17%	17%
Spiny Dogfish	0	3	0	3	0	50%	0%
Haddock	0	4	0	2	0	67%	0%
American Shad	3	0	0	3	0	50%	50%

The comparison of PL to AS sampling was restricted to only three species, as none of the other common bycatch species were encountered under either protocol. PL sampling achieved 20% to 80% agreement with AS in the detection of those three bycatch species (Table 6). Similarly, significant differences between the two protocols were found on 20% to 80% of the trips. While it is difficult to draw conclusions from so few trips sampled, it appears that the amount of agreement between PL and AS sampling was highly variable.

Table 6. Number of trips that detected bycatch species under PL and AS and the percent agreement between the two protocols (top). Number of trips with a significant difference (alpha = 0.05) in bycatch amount of six species, between AS and PS methods (bottom).

Presence-Absence

	Agree		Disagree			% Agree (omit --)
	++	- -	P+	S+	% Agree	
River Herring	3	1	0	1	80%	75%
American Shad	0	1	1	3	20%	0%
Spiny Dogfish	1	3	1	0	80%	50%

Significant Differences

	No Sig Diff		Sig Diff			% No Sig Diff	% No Sig Diff (omit --)
	++	- -	++	P+	S+		
River Herring	2	1	1	0	1	60%	50%
American Shad	0	1	0	1	3	20%	0%
Spiny Dogfish	1	3	0	1	0	80%	50%

Of the 30 trips that were sampled both at-sea and portside, 11 trips (37%) were found to have a significantly non-random distribution of river herring in the catch when sampled at-sea (Figure 5). Similarly, nine trips (30%) were found to have non-randomly distributed river herring when sampled portside. Six of these portside trips were also found to be non-random at-sea, indicating that the distribution of bycatch at-sea often determines the distribution of bycatch seen during the offload at port.

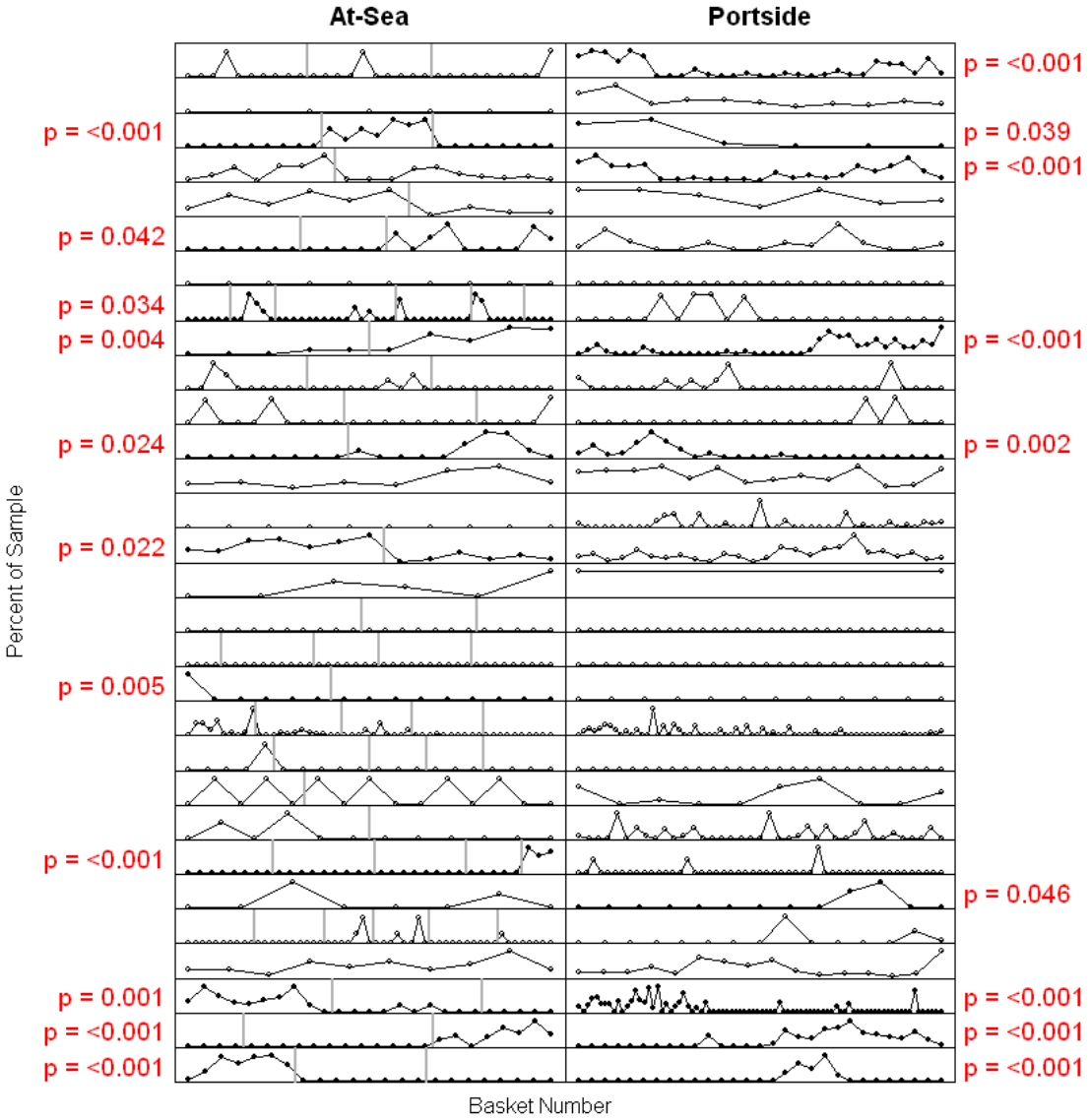


Figure 5. Sequence of river herring observations from the basket samples taken at-sea (left) and portside (right) for each co-sampled trip. The vertical gray lines on the left pane indicate the separation between tows. Trips that were found to have a non-random distribution of river herring are identified by the *p*-value of the runs test in the margin.

Discussion

The results of the simulation experiment indicate that AS and PU sampling should estimate the amount of bycatch on a herring trip with equal precision. However, the precision surrounding these bycatch estimates is primarily determined by the sample size (i.e. the number of baskets), and each protocol arrives at this number differently. The configuration of the hold in the simulation experiment (3 tows with 150 mt total landings) was intentionally designed to create roughly equivalent sample sizes under each protocol. In reality, most herring trips would likely end up with different sample sizes if sampled at-sea or portside. On trips with relatively low landings from a high number of tows, AS sampling will achieve the larger sample size, since AS protocol requires a fixed number of baskets per tow. On the other hand, trips with high landings from few tows will yield a higher sample size under PU sampling, as number of samples taken is a function of pumpout time under the PU protocol. For the 24 trips that were sampled by both methods, 75% had a higher sample size under PU sampling. As a result, the average CV from PU sampling was 42% less than that achieved under AS on the same trips. Despite these dissimilar sample sizes, the empirical data appear to corroborate the results of the simulation, showing little disagreement between PU and AS sampling. None of the trips where both protocols detected a species had significant differences in bycatch estimates. Most of the trips where PU and AS did disagree fell into the "P+" category, or where bycatch was observed in PU but not observed in AS. This is likely a symptom of the larger sample sizes under portside sampling. From the second simulation experiment, it is clear that the likelihood of not detecting a rare bycatch species is far greater at lower sample sizes.

The simulation identified PS sampling as having the highest precision, while being just as accurate as PU and AS methods. Unfortunately, this did not appear to be the case when the empirical data were examined. Although only six trips were sampled by both PS and AS methods, it was clear that the two methods had very poor agreement. Four trips (67%) showed a significant difference in the estimated amount of river herring bycatch. This high amount of disagreement was a surprising find and indicates the presence of a strong bias in PS sampling. It is unlikely that AS protocol is biased, since it is corroborated by the good agreement with PU sampling. A potential source of bias from PS sampling could be that pickers are "missing" bycatch species as they pass by on the conveyor belt. The PS method of sampling assumes that all bycatch are separated from catch and sent to a vat to be sampled from. If a large portion of a particular bycatch species is missed on the picking line, the PS method will significantly underestimate the amount of bycatch. In fact, three of the four trips that had a significant difference in river herring bycatch had a lower estimate under PS sampling. Occasionally, a few random boxes of packaged Atlantic herring are opened for quality control purposes and examined for missed bycatch species. However, since bycatch species such as river herring often account for less than 1% of the weight of trip, the chance of encountering the occasional 'missed' river herring in a randomly selected box is very small. Likewise, if a fraction of 1% of the packaged product is of a different herring species, it unlikely that it would lead to customer complaints.

Although apparently biased, the average precision surrounding the PS estimates of bycatch was 40% less than that of AS sampling on the same trips. Also, PS sampling was far better at identifying the presence of rare bycatch species than AS, with 13 instances of a species being identified under PS sampling but not under AS (P+). There were no cases of a species being identified under AS but not under PS (S+). If it is possible to identify and correct the source of the sampling bias, the PS protocol has the potential to provide the most precise estimate of bycatch for this fishery.

The simulation experiment identified PL sampling as being roughly equivalent to PU and AS sampling for trips that had randomly distributed bycatch in the hold (i.e. similar tows scenario). However, PL sampling was particularly vulnerable to non-random bycatch distribution. Intuitively, this vulnerability is caused by focusing all of the sampling on a small portion of the hold. If bycatch are more concentrated in the trucks selected for sampling, the resulting bycatch estimate will be too high. Conversely, if trucks with less bycatch are selected, the bycatch estimate will be too low, or none will be detected at all. The other protocols distribute the sampling effort across the entire catch, and are therefore more robust to non-randomly distributed bycatch. From the results of the runs test, it appears that non-random bycatch is fairly common in this fishery, with more than a third of the examined trips identified as having river herring non-randomly distributed in the catch. A previous comparison of portside and at-sea bycatch estimates relied heavily on data from PL sampling (Appendix A) and yielded relatively poor agreement between portside and at-sea estimates of bycatch. It appears the frequency of non-random bycatch coupled with the vulnerability of PL sampling to this phenomenon is the primary cause of the disagreement found in that investigation. It is important to note that sampling the offload from trucks is not inherently flawed, and could provide a reliable estimate of bycatch if it is possible to sample *all* the trucks from a particular trip. In many cases this may not possible, as trucks filled from a single hold are often destined for multiple locations. In any case, portside resources should be directed to ensure that the entire catch from a trip is available for sampling.

Currently, estimates of bycatch in this fishery are derived from AS sampling alone. The high amount of agreement between PU and AS sampling found in this investigation lends credibility to both programs and it seems reasonable to combine bycatch estimates from trips sampled under either protocol. Incorporating PU sampled trips could reduce the CV on the fishery-wide estimate of bycatch by dramatically increasing the sample size, particularly for areas and gears with limited AS sampling coverage. In addition, PU sampling can be a far more efficient use of limited resources than AS sampling: Consider the midwater-trawl trip from the simulation experiment, with 150 mt of landings that takes approximately 5 hours to offload. Depending on the fishing area and port of landing, this might be a four to six day trip. The total cost of sampling that trip portside would be approximately $350 (2 samplers at ~$35 / hr for 5 hrs), whereas the AS cost would likely be $5000 to $7000 (1 sampler at ~$1200 / day). If additional sampling resources are to be directed at this fishery beyond those already required by the NEFOP allocation algorithm (SBRM), portside unsorted sampling should be considered as it is a reliable cost-effective method of estimating retained bycatch.

Appendix III

Impacts of Alternatives Under Consideration in Amendment 5 to Allocate Observer Coverage on Limited Access Herring Vessels

1.0 INTRODUCTION AND BACKGROUND

Alternatives Under Consideration:

Alternative 1: No Action
Alternative 2: Require 100% Observer Coverage on Limited Access Herring Vessels
Alternative 3: Require SBRM Coverage Levels as Minimum Levels
Alternative 4: Allocate Observer Coverage Based on Council-Specified Targets/Priorities

Funding Options

Option 1: No Action
Option 2: Federal and Industry Funds

Options for Observer Service Providers

Option 1: No Action
Option 2: States Authorized as Service Providers

1.1 HERRING PDT ANALYSIS

The Herring PDT began working on analyses related to the allocation of observer coverage in the Atlantic herring fishery in 2009, as the Committee and Council continued to discuss issues and develop the details of the alternatives for Amendment 5. Much of the PDT's preliminary work/analysis during 2009 and 2010 informed decision-making and the development of the details of the Amendment 5 alternatives.

As an important step in this analysis, the Herring PDT reviewed in detail all available catch/bycatch sampling data for the Atlantic herring fishery. A preliminary analysis was conducted to examine similarities and differences between bycatch data collected by observers versus portside samplers (see Appendix IIA in Volume II). The PDT formed a working group to examine all available data from overlapping portside/sea sampling trips in detail to investigate differences between the data sets and discuss sampling methodologies. Understanding the reasons for the differences between portside and at-sea estimates will improve the overall understanding of the data and increase the usefulness of future data collected through both programs. The working group met informally between PDT meetings during 2010 and 2011 to wade through the details of the sampling data and develop general approaches to analyses prior to full PDT meetings.

The PDT continued to discuss data issues and conducted a second review of the sampling data in early/mid 2011, to further investigate sampling and bycatch estimation methods from both the at-sea and portside sampling programs, to consider the intensity of sampling, to gain a better understanding of how variation in the system may be influencing the analyses. This second phase of the PDT assessment (see

Appendix IIB in Volume II) will frame the recommendations in Amendment 5 regarding how portside sampling data can continue to be utilized to improve catch monitoring and bycatch estimation in the herring fishery. In general, the analysis shows that there is better agreement than previously thought between the two programs with respect to river herring bycatch estimation, although problems exist with specific portside methods. It will be important to identify and consider the strengths and weaknesses of both programs in order to determine the best way to combine the programs and generate the most precise estimate of bycatch, especially since a large component of the "bycatch" in this fishery is landed. However, sea sampling remains the best method for estimating bycatch and provides important information about catch and the operation of the fishery that cannot be generated from a portside sampling program.

During 2011, Council staff worked with NMFS NERO staff and the Herring PDT to review available data and develop/analyze potential management alternatives that capture the Council's intent with respect to the range of alternatives that was approved in January 2011. To streamline the Amendment 5 document and promote ease of understanding, several elements of the Amendment 5 measures were "packaged" into the range of alternatives that will be incorporated into the Draft EIS. As such, a few notable changes have been made to the management alternatives since the January 2011 version:

- When the Council approved the range of alternatives for Amendment 5, it eliminated alternatives that proposed to establish a Federal portside sampling program for the herring fishery from further consideration at this time. As a result, the ***Funding Options*** only apply to catch monitoring at-sea and have been incorporated into the alternatives described in this document.
- The fifth option approved by the Council for consideration in January is intended to improve the accuracy of river herring bycatch estimates by overlaying a seasonal stratification of SBRM-allocated observer days.. The Herring PDT explored this option and attempted to develop analyses to illustrate such an approach. However, the details of this approach could not be developed at this time because of data limitations (see additional discussion below). While this option no longer appears as a stand-alone alternative, Council staff and the PDT have incorporated the Council's intent into the range of alternatives under consideration to allocate observer days (for example, some of the alternatives propose to include a PDT process to supplement the SBRM process, to consider the allocation of additional observer days to address river herring priorities identified by the Council).

Several different management measures/options were approved by the Council in January 2011 to address the allocation of observer coverage in the Atlantic herring fishery. **These measures have now been developed into *Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels*** (See Volume I). Each management alternative under consideration includes measures/options that:

1. Establish targets/priorities for annually allocating observer coverage sea days on limited access herring vessels (Categories A/B/C when on a declared herring trip);
2. Specify a process through which the distribution of observer days is evaluated and considered annually by the Council relative to other priorities and funding needs;
3. Specify a funding source (and any related provisions) for observer days that may be required beyond those that can be funded using Federal resources; and
4. Establish provisions for utilizing observer service providers and authorizing waivers, if necessary.

Once the general range of alternatives was approved in January 2011, the Herring PDT began to develop a more focused method of evaluating the approaches under consideration and assessing the potential impacts on the Atlantic herring fishery. The PDT discussed possible levels of coverage to consider in the context of the management options the Council had identified. Several options in the document focus on methodologies for determining observer coverage levels from the Standardized Bycatch Reporting

Methodology (SBRM). The Council has also developed an option that would require observer coverage to be at a level that would allow for catch estimates to be generated for herring and haddock with a 30% coefficient of variation (CV) and river herring with a 20% CV (i.e., more precise).

1.2 GENERAL IMPACTS OF ALTERNATIVES UNDER CONSIDERATION – HERRING PDT COMMENTS

The Herring PDT offers the following comments that apply to the alternatives under consideration to allocate observer coverage on limited access herring vessels.

An important consideration for **Alternative 1, Alternative 3, and Alternative 4** relates to understanding precision targets. CVs (coefficients of variation) provide a convenient way to compare the relative uncertainty of two estimates (lower is better), but they must be interpreted carefully. Assuming a normal distribution, ***doubling*** the CV produces the approximate 95% confidence interval. For example, a CV of ***0.30*** for a bycatch estimate (or 30%) means that if the data could be re-sampled or re-collected, the resulting new estimate would be within ***± 60%*** of the original estimate 95% of the time (the other 5% of the time the new estimate would be more than 60% different). Also, by not including certain sources of uncertainty (e.g. within-tow variability from basket sampling, fish stratification, other factors), the true uncertainty is even greater than what is suggested by SBRM calculations of CV.

- The Council is clearly interested in generating both precise and accurate estimates of catch and bycatch in the Atlantic herring fishery. The SBRM methodology relies on a ratio estimator, which carries an inherent bias that is inversely proportional to the sample size (i.e. more samples yields a smaller bias). Despite this slight bias, the ratio estimator is still desirable because it uses information about the total amount of catch to minimize the uncertainty surrounding the bycatch estimate. However, for this benefit to occur there has to be a positive relationship between the amount of bycatch and the total amount of catch. If this relationship does not exist, then the ratio estimator may not be an appropriate method of estimating bycatch in this fishery.
- There are costs associated with increasing the precision of bycatch estimates resulting from observer data. A lower target CV means more sea days/observer trips are required to achieve that level of precision. When observed bycatch events are infrequent yet highly variable, the additional sampling coverage required may be substantial. This tradeoff between precise estimates and the cost of sampling coverage must be thoroughly explored when designing an appropriate observer program and prioritizing available resources. An important question to consider, especially with respect to river herring bycatch, is how much (cost-wise) is it worth to generate a very precise estimate of what is expected to be a relatively low number? Similarly, if there is no reason to suspect that the fleet will encounter river herring in a particular strata, then how much funding should be directed at sampling that strata sufficient enough to try to achieve a specific CV?
- The PDT acknowledges the challenges associated with determining coverage levels and allocating limited sampling resources to achieve target CVs in all strata, particularly in the herring fishery where variability is significant both spatially and temporally. Moreover, the management measures proposed in Amendment 5 could require some sub-areas within the SBRM strata to require observer coverage, consequently moving the entire system away from a random stratified design and towards a more systematic sampling approach designed to meet certain objectives, which should be more clearly specified in the document. This will complicate the development of options designed to achieve target levels of precision across all strata in the fishery. Some bycatch problems can be moving targets, varying seasonally or annually due to regulations, environmental factors, and species abundance. Over the long-term, the process for optimizing the allocation of observer resources requires flexibility and adaptability.

- The vast majority of bycatch in the Atlantic herring fishery is retained and landed, as opposed to discarded at-sea. While this makes applying SBRM methodology difficult, it presents an opportunity to sample the catch portside, as it is offloaded. Initial investigations into the comparability of at-sea and portside sampling found troubling discrepancies between the two programs (Appendix IIA). However, a follow-up analysis identified the source of the discrepancy, and found generally good agreement between the two programs (Appendix IIB). This analysis and the PDT's findings directly relate to the fourth goal set by the Council for the Amendment 5 catch monitoring program: to determine if at-sea sampling provides bycatch estimates similar to dockside monitoring estimates (see Amendment 5 Goals and Objectives).

  This is a significant finding because portside sampling can be a far more efficient use of resources (e.g. $350 to sample a typical midwater trawl trip portside (based on a median trip size of 150 mt and five hours pump out), compared to $3,600 at-sea (based on a median trip length of three days at $1,200 for NEFOP observer coverage per sea day). If an alternative that requires additional observer coverage is adopted, portside sampling could provide a substantially lower cost solution.

2.0 IMPACTS OF ALTERNATIVE 1 (NO ACTION/STATUS QUO)

2.1 THE STANDARDIZED BYCATCH REPORTING METHODOLOGY (SBRM) AND ITS RELATIONSHIP TO THE AMENDMENT 5 ALTERNATIVES

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. The SBRM provides a structured approach for evaluating the efficacy of the allocation of observer coverage (sea days) to multiple fisheries (52 fleets) to monitor a large number of species (15 SBRM species groups) under the 13 different fishery management plans, the Marine Mammal Protection Act, and the Endangered Species Act.

Proposed Rule August 21, 2007

Final Rule January 28, 2008

Implementation February 27, 2008

13 FMPs, 39 managed species, 14 types of fishing gear

The purpose of the SBRM amendment is to:

- Explain methods and processes by which bycatch is currently monitored and assessed
- Determine whether the current methods/processes need to be modified and/or supplemented
- Establish standards for precision of bycatch estimates for all Northeast Region fisheries, thereby documenting the SBRM

The SBRM Amendment addresses:

- Bycatch reporting and monitoring mechanisms
- Analytical techniques and allocation of at-sea observers

- SBRM performance standard
- Review and reporting process
- FWA and provisions for annual specifications
- Prioritization process
- Provisions for industry-funded observers and observer set-aside programs

Summary of the (2008) Northeast Region SBRM Amendment

1. **Methods by which data and information on discards are collected and obtained (status quo – NEFOP)**

   SBRM maintains the current methods by which discard data/information are collected and obtained. NEFOP continues to serve the primary mechanism to obtain data on discards in all Northeast Region commercial fisheries managed under one of the FMPs. The SBRM also will incorporate, to the extent practicable and appropriate for the NER, all surveys and data collection mechanisms implemented by NMFS as a result of the agency-wide redesign of the MRFSS Program.

2. **Methods by which the data from #1 are analyzed and utilized to determine the appropriate allocation of at-sea observers**

   SBRM amendment expands/refines the status quo methods by which data obtained through #1 are analyzed and utilized to determine the appropriate allocation of observers to fully incorporate all managed species and relevant gear types in the NER. All filters identified in the amendment will be applied to the results of the analysis to determine the observer coverage levels needed to achieve the objectives of the SBRM.

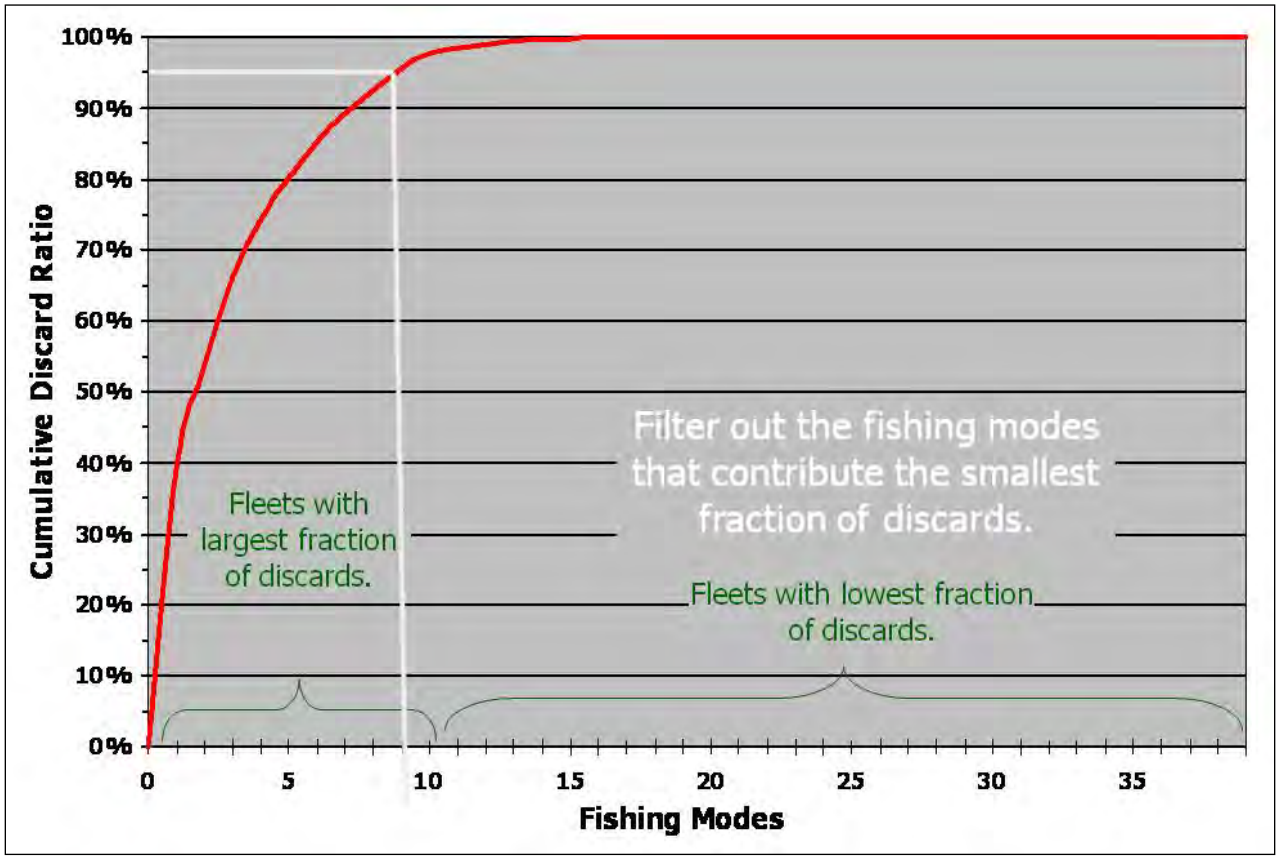
3. **Performance measure by which the effectiveness of the SBRM can be measured, tracked, and utilized to effectively allocate the appropriate number of observer sea days**

   Performance standard set at a 30% CV – to ensure the effectiveness of the SBRM so that it can be measured, tracked, and utilized to allocate the appropriate number of observer days. Each year, the NMFS Regional Administrator and Science Director will (subject to any external operational constraints) allocate observer coverage to the applicable NER fisheries sufficient to achieve a level of precision (measured as the CV) no greater than 30 percent for each applicable species/species group, subject to the filters identified in the amendment.

   Importance Filters: 95% of discards and 98% of total mortality

   If a particular stratum contributes less than 5% to the total discards or less than 2% of the total mortality of a particular species, it is not included in the allocation of observer sea days. An illustrative representation of the 95% discard filter is provided in Figure 1.

Figure 1 SBRM Importance Filter (95% Discards)



4. Process to provide the Council with periodic reports on discards and the effectiveness of the SBRM

SBRM amendment requires an annual report on discards to the Council, prepared by NMFS, and a report every three years that evaluates the effectiveness of the NER SBRM. SBRM amendment lays out the minimum requirements for each of these reports.

5. Measure to enable the Councils to make changes to the SBRM through framework adjustments and/or annual specification packages rather than full amendments;

Changes to the SBRM may be effected either through a framework adjustment or specifications process. Changes that can be considered through these processes include:

- Changes to the CV-based performance standard
- Means by which the discard data are collected/obtained for the fishery
- Reporting on discards or the SBRM
- Stratification (modes) used as the basis for SBRM-related analyses
- Establishment of a requirement for industry-funded observers
- Observer set-aside provisions.

6. **Process to provide the Councils and public with an opportunity to consider, and provide input to, the decisions regarding prioritization of observer coverage allocations**

   In any year in which external operational constraints would prevent NMFS from fully implementing the required observer coverage levels, the RA and Science Director will consult with the Councils to determine the most appropriate prioritization for how the available resources should be allocated. Includes requirements to provide the Councils with: (1) observer coverage levels required to attain the performance standard in each applicable fishery; (2) coverage levels that would be available if the resource shortfall was allocated proportionately across all applicable fisheries; (3) coverage levels that incorporate the recommended prioritization; and (4) rationale for recommended prioritization. Recommended prioritization should be based on meeting the data needs of upcoming stock assessments; legal mandates under MMPA, ESA, or other law; meeting the data needs of upcoming fisheries management actions, taking into account the status of the resource(s); improving the quality of discard data across all fishing modes; and/or other criteria identified by NMFS or the Councils.

7. **Implement consistent, cross-cutting observer service provider approval and certification procedures and enable the Councils to implement either a requirement for industry-funded observers or an observer set-aside program through a framework adjustment rather than FMP amendment**

   The SBRM amendment implements these procedures and enables the Councils to implement either a requirement for industry-funded observers or an observer set-aside program through a framework adjustment rather than full amendment. The intent of the SBRM amendment was to create a more efficient process for the Councils to develop industry-funded programs, should the need arise in any fishery. Actual implementation of an industry-funded observer program that would enable fishing vessels to select from a list of approved service providers would require the Council to initiate, develop, and have approved such a program for each particular fishery.

What does the SBRM do?

- The SBRM provides a general structure for defining fisheries into homogeneous groups and allocating observer coverage based on prior information and the expected improvement in overall performance of the program.
- The SBRM is intended to support the application of multiple bycatch estimation methods that can be used in specific stock assessments.
- The general structure helps identify gaps in existing coverage, similarities among groups that allow for realistic imputation, and the tradeoffs associated with coverage levels for different species.
- The SBRM uses the previous year's information on the precision of estimated discard totals to define sampling targets for an upcoming year.
- The SBRM estimates discards of all species, including river herring, for the 52 fleets in the Northeast region.
- The SBRM allows for continuous improvement in allocation as new information on the results of the previous year's data are obtained.

What does the SBRM not do?

- The SBRM does not estimate incidental catch, retained catch, or landed bycatch.
- The SBRM is not intended to be the definitive document on the estimation methods nor is it a compendium of discard rates and total discards (Wigley et al. (2007).
- The SBRM does not include river herring as one of the species that drives the allocation of observer days (because it is not a federally managed species).

Can the SBRM methodology be utilized to achieve precision targets for river herring bycatch estimates?

- Currently, the answer to this question is "no" because river herring is not listed as one of the bycatch species used in the SBRM to allocate observer days. The SBRM can be used to determine what levels of precision are being achieved under the current allocation of observer coverage across the 52 fleets, but the process does not utilize river herring as a species to determine allocations. If the Council determines that the precision of river herring bycatch estimates is an important factor for allocating observer coverage in the fishery, then this is one of the shortcomings of the no action alternative. Furthermore, most of the river herring bycatch in this fishery is retained (not discarded) and is therefore not addressed by SBRM methodology.
- There are a few important caveats to consider when applying the SBRM approach to river herring – the assumptions about linearity and normality in the SBRM analysis may not hold for river herring because the distribution of the data is not normal (there is a high proportion of zeros), and there is a high degree of variability associated with the data. Seasonality (of the fishery and of river herring migrations/encounters) is also very important to consider. The SBRM approach considers variability associated with observed trips, but does not consider variability associated with any strata where coverage has been limited or absent. It also does not consider the variability associated with sub-sampling and extrapolation, and portside versus at-sea coverage, all of which are important especially with respect to river herring. Other alternatives under consideration appear to more adequately address this particular issue.

How is "Herring NK" and "Fish NK" treated in the SBRM approach?

- Herring NK and Fish NK are not used in the numerator when developing a discard ratio (discarded/kept). Any species reported as Herring NK or Fish NK that are discarded are not incorporated into the SBRM analysis. Any Herring NK or Fish NK that are kept on the vessel are incorporated into the denominator (total catch). For more information about sampling and documenting Fish NK and Herring NK, see the analyses presented in Volume I of the Amendment 5 DEIS.

2.1.1 **Timing**

The SBRM Omnibus Amendment requires annual consultations with the Councils and public to summarize observed discard rates in the preceding year and more importantly to review and refine plans for monitoring commercial fishing fleets in the upcoming year. This annual cycle is synchronized with the availability of previous years' data (July to June), time to acquire and audit data (July-September), sufficient time to conduct the statistical analyses (October-December), annual Council meetings (January-April), and the normal federal budget and contracting cycle.

Table 1 Summary of Annual SBRM Reporting Cycle (Timing)

Annual SBRM Reporting Cycle	SBRM 2009	SBRM 2010	SBRM 2011
Data Used (12-month period)	Jul 2007 - Jun 2008	Jul 2008 - Jun 2009	Jul 2009 - Jun 2010
Data Entry Data Analysis and Document Preparation	Jul-Sep '08 Oct 2008 - Jan 2009	Jul-Sep '09 Oct 2009 - Jan 2010	Jul-Sep '10 Nov 2010 - Jan 2011
1) Annual Report, Sea Day Analysis and Prioritization documents; 2) Presentation to NEFMC/MAFMC; 3) Prioritization Comment Period; 4) Final Budget received, Consideration of Comments, Re-prioritization document	Jan 2009 – Mar 2009	Jan 2010 – Mar 2010	Jan 2011 – Mar 2011
Response to Comments and Re-prioritization document	Apr 2009	May 2010	Apr 2011
NEFOP Sea Day Schedule (12 month period)	Apr 2009 - Mar 2010	Apr 2010 - Mar 2011	Apr 2011 - Mar 2012

2.1.2 Relationship Between SBRM Fleets and Limited Access Herring Vessels (Categories A/B/C)

The SBRM is stratified by:

- Quarter (based on date landed)
- Geographic Region (NE/MA based on port of departure)
- Gear Type (based on *negear*, single/pair midwater trawl are combined)
- Mesh Size (>5.5"< for otter trawl and three groups for gillnets)
- Access Area (AA and OPEN)
- Trip Category (General Category/limited access Scallop)

=52 Fleets

The relationship between the SBRM fleets and the limited access herring vessels that would be subject to the Amendment 5 provisions is difficult to characterize and address in the analysis. Table 2 illustrates the relationship between the SBRM fleets and the limited access herring vessels. This analysis is based on VTR data and uses three metrics to correlate the SBRM Fleets to the limited access herring vessels – number of trips, number of permits, and pounds of fish. This shows whether or not the SBRM fleets – Mid-Atlantic purse seine, New England purse seine, Mid-Atlantic midwater trawl, and New England midwater trawl – are active in the herring fishery and/or other fisheries. The first three rows in the table demonstrate that the Mid-Atlantic purse seine fleet does not correlate with the Atlantic herring fleet; only

one Category A and one Category C vessel is represented by the data for this fleet. The Mid-Atlantic purse seine fleet is likely representative of the Atlantic menhaden fishery.

There is a strong relationship between the herring Category A vessels (most of the limited access directed fishery participants) and the New England midwater trawl fleet, the Mid-Atlantic midwater trawl fleet, and the New England purse seine fleet. **Therefore, the Herring PDT has determined that the SBRM process and the allocation of days to the New England and Mid-Atlantic midwater trawl and New England purse seine fleets through the SBRM analysis sufficiently covers the majority of the Category A limited access directed herring vessels**.

Category C vessels present more of a challenge because they are a more diverse fleet, and many of the Category C vessels use bottom trawls. The Herring PDT example analysis in **Alternative 4** (Section 5.1) includes bottom trawl vessels with Category A/B/C herring permits, so allocating an appropriate number of days to the small mesh bottom trawl herring vessels could be determined using an approach similar to SBRM, i.e., applying proportions based on fishing activity by these vessels in the previous year, under the assumption that the next year will be similar to the previous year.

Table 2 Relationship of SBRM Fleets to Herring Limited Access Vessels

SBRM Year	SBRM Fleet	PLAN	CAT	No. Trips	No. Permits	Total Lbs.	Herring Lbs.	Mackerel Lbs.	Squid/Mack/ Butter Lbs.	% of trips	% of permits	% of Lbs.
2010	MA PS			121	5	18,370,430	0	0	0	57.3%	71.4%	55.5%
2010	MA PS	HRG	A	21	1	5,045,000	0	0	0	10.0%	14.3%	15.2%
2010	MA PS	HRG	C	69	1	9,680,000	0	0	0	32.7%	14.3%	29.2%
2010	NE PS			35	6	7,621,685	800,180	0	2,130	11.7%	31.6%	10.0%
2010	NE PS	HRG	A	244	12	67,948,643	57,462,242	0	0	81.3%	63.2%	89.4%
2010	NE PS	HRG	C	21	1	429,850	0	0	0	7.0%	5.3%	0.6%
2010	MA MWT			3	1	250,000	0	0	250,000	4.3%	10.0%	1.1%
2010	MA MWT	HRG	A	65	8	22,115,218	12,732,000	9,233,218	9,383,218	92.9%	80.0%	98.7%
2010	MA MWT	HRG	C	2	1	45,784	0	0	0	2.9%	10.0%	0.2%
2010	NE MWT			9	1	15,529	0	1	14,701	2.9%	6.3%	0.0%
2010	NE MWT	HRG	A	305	15	141,874,785	106,092,660	35,765,850	35,770,150	97.1%	93.8%	100.0%
2011	MA PS			137	4	15,208,302	0	0	0	64.0%	80.0%	61.8%
2011	MA PS	HRG	C	77	1	9,400,000	0	0	0	36.0%	20.0%	38.2%
2011	NE PS			27	9	4,238,560	113,500	0	40	12.5%	39.1%	9.8%
2011	NE PS	HRG	A	146	11	37,696,726	34,476,726	0	0	67.6%	47.8%	87.4%
2011	NE PS	HRG	C	43	3	1,201,078	769,158	1,470	1,470	19.9%	13.0%	2.8%
2011	MA MWT	HRG	A	25	7	8,269,700	3,664,000	4,305,700	4,305,700	100.0%	100.0%	100.0%
2011	NE MWT			6	2	1,269	170	0	254	1.9%	11.1%	0.0%
2011	NE MWT	HRG	A	304	16	155,950,158	143,150,232	12,720,319	12,720,639	98.1%	88.9%	100.0%

2.1.2.1 Impacts of Alternative 1 on VECs

Impacts on Atlantic Herring

Since Alternative 1 (No Action) represents the status quo, no additional impacts on the Atlantic herring resource are expected.

Impacts on Non-Target Species and Other Fisheries

Since Alternative 1 (No Action) represents the status quo, no additional impacts on non-target species and other fisheries are expected.

Impacts on Physical Environment and EFH

Since Alternative 1 (No Action) represents the status quo, no additional impacts on EFH are expected.

Impacts on Protected Resources

Since Alternative 1 (No Action) represents the status quo, no additional impacts on protected resources are expected.

Impacts on Fishery-Related Businesses and Communities

Since Alternative 1 (No Action) represents the status quo, with no change, no additional impacts on herring-related businesses or communities are anticipated. Interviews with industry participants indicate that the current SBRM-based allocation of observer coverage is regarded as fair and adaptable to changes. Since this methodology also applies to other fisheries, herring fishery participants do not feel unduly targeted.

3.0 IMPACTS OF ALTERNATIVE 2 (100% OBSERVER COVERAGE)

3.1 IMPACTS OF FUNDING OPTIONS

Amendment 5 considers alternatives that would require additional observer coverage on herring limited access vessels and options that may require some/all of the additional coverage to be funded by the fishing industry. **Alternative 2** proposes 100% observer coverage on limited access herring vessels, which would require additional funds. **Alternative 3** and **Alternative 4** may also require additional funds to achieve the desired levels of coverage.

Funding Options

Option 1: No Action

Option 2: Federal and Industry Funds

Development of an industry-funded observer program will require clear and concisely documented goals, objectives and standards. An industry-funded observer program would require NMFS approval of an observer service provider based upon the published standards. The program would then require further development of the specific objectives of data collection, and data quality standards to be incorporated and merged with current and existing data collection and monitoring programs. Observer data would be delivered to the NEFOP for data editing, auditing, archiving and quality assurance control. Training of observers and data processing standards would be further developed by the NEFOP, in order to provide

consistency across data collection. A NEFOP observer is estimated to cost approximately $1,200 per sea day.

In order to place the costs of industry-funded observers into context, Table 3 summarizes average revenues per trip, average revenues per day absent, operating costs per trip, and operating costs per day absent, classified by gear type for 2008-2010. Revenues were calculated using the VTR and Dealer data while operating costs were based on data collected through the observer program. Operating costs in this fishery are primarily fuel expenses; the price of fuel has fluctuated (along with the price of crude oil) over the past three years. There has been very little observer coverage for Category A/B/C vessels using bottom trawl gear to fish for Atlantic herring. The bottom trawl trips which have been observed have tended to be shorter in length than those not observed (and reported through VTRs).

Table 3 2008-2010 Average Revenues, Costs Per Day and Average Revenues, Costs Per Trip for Category A/B/C Herring Vessels

	Revenue/Day	Revenue/Trip	Operating Costs/Day	Operating Costs/Trip
Single Midwater Trawl	$12,853	$41,721	$4,271	$12,608
Pair Trawl	$15,683	$43,166	$3,295	$9,372
Purse Seine	$18,557	$25,499	$1,798	$2,746
Bottom Trawl	$5,325	$7,863	$785	$524

Revenue Data is from VTR and Dealer (n=5,329)
Operating Costs data is from Observer (n=352)

Relative to the daily operating costs for the fishery, the cost of an observer is fairly high. For example, a NEFOP observer would increase the per-day costs of single midwater trawl, pair trawl, purse seine and bottom trawl by 28%, 36%, 67%, and 153% respectively (Table 4). However, relative to daily revenues, the cost of an observer is lower; an observer would cost 9%, 9%, 6%, and 22% of average daily revenues for the midwater, pair trawl, purse seine, and bottom trawl vessels respectively. These figures are presented for illustration; it is possible that the type of data required in this fishery would result in higher or lower per-day costs than the $1,200 amount used.

Table 4 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs

	Revenue	Costs
Single Midwater Trawl	9.3%	28.1%
Pair Trawl	7.7%	36.4%
Purse Seine	6.5%	66.7%
Bottom Trawl	22.5%	152.8%

3.1.1 Options for States As Service Providers

The proposed ***Requirements for Service Providers*** (see Management Alternatives, Volume I) currently only apply to a Federal sea sampling program, should service providers be utilized to sample the fishery beyond the scope of Federal resources. The Council is considering an option to authorize State agencies to be service providers for catch monitoring (sea sampling/observer coverage).

Option 1: No Action. Under the no action option, States would not be authorized in Amendment 5 as service providers for observer coverage. If a State Agency intends to provide sea sampling services for Atlantic herring vessels, it would apply to NMFS to become an authorized service provider, consistent with the provisions specified in 50 CFR 648.11(h) and (i)– *Observer service provider approval and responsibilities* and *Observer certification.*

Option 2: States Authorized as Service Providers. Under this option, Amendment 5 would authorize all States in the Northeast Region as service providers for sea sampling on limited access Atlantic herring vessels (i.e., States would be "grandfathered" in as service providers). States would not be required to apply to NMFS for an authorization and comply with the provisions specified in 50 CFR 648.11(h) and (i).

Currently, the States are not providing observer services (i.e. are not acting as observer service providers for the federally funded observer program). The State of Maine does have an employee that collects data at sea in the Atlantic herring fishery, but the other states do not cover the herring fleet, although to a limited degree cover other fisheries. If State Agencies are interested in becoming a certified observer service provider, under the no action option, the States would need to acquire NMFS approval and follow the same procedures as any other service providers. The approval process would be very similar to that of non-state observer service providers as it asks for general standards and operational details for hiring and deploying observers, which need to be clear regardless of who is applying.

Under Option 2, the States would be grandfathered in, and would not be required to apply for approval. This option would limit the amount of information that is obtained and pre-defined, and the State Agencies' operational details would be unknown. NEFOP personnel have expressed support for Option 1 (no action) to ensure that State Agencies adhere to the same requirements as other service providers, should service providers be utilized for sea sampling in the herring fishery. It remains unclear what qualifications, insurance, observer support would be offered under Option 2. These details are important in the development of an observer program and will affect successful data collection.

During the public comment period on the Amendment 5 Draft EIS, Council staff will work with NMFS NERO and NEFOP staff to review the current provisions and requirements for service providers (50 CFR 648.11(h) and (i)– *Observer service provider approval and responsibilities* and *Observer certification*), based primarily on the observer program for the sea scallop fishery. Prior to final decision-making, Council staff will brief the Council on any substantive changes to be made to the regulations in order to accommodate an industry-funded observer program that utilizes service providers in the herring fishery, should the Council select to establish one in this amendment.

3.1.1.1 Impacts of Alternative 2 on VECs

Impacts on Atlantic Herring

All of the alternatives related to allocating observer coverage on limited access herring vessels have the potential to improve the precision of estimates of discards or landed bycatch. In the short-term, the increased precision may prevent premature fishery closures or the chance for ACL/sub-ACL overages. Consequently, Atlantic herring stock abundance would be more likely to remain above management targets. In the long-term, however, increased observer coverage may only have marginal effects on herring abundance.

Impacts on Non-Target Species and Other Fisheries

Requiring 100% observer coverage would represent a census the Atlantic herring fishery, which, in theory, should result in a CV of zero on estimates of bycatch. Because of the variability inherent in sampling of this fishery, it may be difficult, if not impossible, to generate bycatch estimates for non-target species like river herring with a CV of zero. There is not agreement across scientific literature about what sufficient levels of observer coverage may be, especially in high-volume fisheries where most bycatch is retained and landed. More observer coverage is clearly favored to increase precision and capture rare events. 100% observer coverage is usually regarded as ideal to accurately report bycatch and determine discard rates, but is financially challenging and may not be feasible for a variety of reasons. At minimum, "adequate" levels of observer coverage should be un-biased (taking into account non-random sampling and fishermen's behavior in the presence of observers).

In general, Alternative 2 would have a positive impact on non-target species and other fisheries simply from the significant increase in coverage and sampling that would result under 100% coverage of limited access herring vessels. However, if additional funding is not available, Alternative 2 could shift sampling resources away from other fisheries. Consequently, these under-sampled fleets would have less precise estimates of bycatch, which could lead to greater management uncertainty and a poorer understanding of their impacts on the resource.

Impacts on Physical Environment and EFH

Alternative 2 would increase observer coverage levels for limited access herring vessels to 100%, with two funding options: federal (option 1) and federal/industry (option 2), and an additional option to certify states as observer service providers (option 1 would not authorize states; option 2 would authorize states). This alternative could lead to a decrease in herring trips if industry funding is required and vessels are unwilling or unable to absorb the cost of observer coverage, given expected revenues and other costs. This decrease in fishing effort would be expected to lead to a decrease in herring fishery impacts on EFH, although the decrease in impacts would be small as the total magnitude of herring fishery impacts on EFH is minimal. If the increase in coverage is federally funded, a decrease in herring fishing effort, and thus in fishery impacts on EFH, would not be expected.

Impacts on Protected Resources

This option has the potential to have a low positive impact on protected resources. There is likely to be no increase or decrease in effort, but as was stated in the impacts on non-target and other species, 100% observer coverage would represent a census of the Atlantic herring fishery. The measure has the portential to therefore provide as much information as possible on any and all protected resources that were encountered by the fishery, to the extent that a service provider could possibly sample. A problem for protected resources, however, is similar to the problem with non-target and other species, where the

variability inherent in sampling of this fishery makes it difficult, if not impossible, to generate bycatch estimates with a CV of zero. More observer coverage, however, would capture the rarer events of encounters of protected species with the herring fisheries, and has the potential to improve general knowledge of them.

In comparison to the No Action Alternative, Alternative 2 has the potential to have a low positive impact on protected species by increasing the amount of information that is gathered, and therefore increasing the amount of knowledge with respect to those species. If additional funding is not available, however, Alternative 2 could shift sampling resources away from other fisheries, thereby decreasing the amount of knowledge gained by different types of vessels in different areas. Ultimately, this may lead to an imbalance in gathered information on species not encountered by the herring fishery. The uncertainty inherent in this Alterative due to potential funding problems means that the impacts of this action are difficult to determine, and therefore can be considered unknown.

Impacts on Fishery-Related Businesses and Communities

Alternative 2, requiring 100% observer coverage, would only create negative impacts on herring-related businesses or communities if Federal funds were not used to pay for the additional observer coverage. If Funding Option 1 (no action) were selected, the presumption is that Federal funds would be used. If Option 2 prevailed, requiring industry funds to cover costs when Federal funds were unavailable, negative impacts on herring fisheries participants are likely. Such increased economic costs could trigger additional losses of vessels and processing plants, thereby also affecting bait supplies for other fisheries.

In 2010, a NEFOP observer costs approximately $1,200 per day. If industry members were required to pay for observers for every fishing day, these extra costs would become a significant burden for those fishing for this modestly-priced product. While vessels that hold the highest volumes might be able to tolerate the expense, vessels with smaller capacity would be facing severe constraints, including the potential for losing their ability to fish for herring.

Further, with both at-sea and portside observer programs suggesting that the herring fishery is a relatively clean fishery, a requirement for 100% observer coverage that must be funded by industry seems unfair to participants, if not punitive. This is particularly noteworthy since the resource is not considered overfished, nor is overfishing occurring.

Category A/B Versus Category C Vessels

Information presented in the Affected Environment (Volume I) indicates that Category A herring vessels represent the vast majority of the fishery, landing more than 97% of the herring in 2010. An additional four limited access Category B vessels, all with Category C permits (for Area 1) landed close to 1% of all herring during the 2010 fishing year. There are another 55 Category C vessels that participate in various fisheries and catch herring incidentally, representing about 1% of the total herring landings in 2010. The costs of incorporating the additional 55 Category C vessels into an industry-funded observer program for the herring fishery should be considered relative to the goals of the monitoring program and the expected outcomes, especially given the level of participation by these vessels in the herring fishery.

Based on information from the 2009 fishing year, 100% coverage of Category A/B vessels would cost between $2.36M per year (see below). The herring fishing industry is likely to spend *fewer* days fishing in the future due to reductions in catch limits. Therefore, the cost of at-sea monitoring of the Category A/B vessels reported in this analysis should be regarded as an *upper bound* of the cost of monitoring. However, this also presumes that an observer could be placed on a Category A/B vessel before it began a herring fishing trip, through a Pre-Trip Notification.

To illustrate this and provide some perspective on costs associated with 100% observer coverage, data provided by Maine DMR was used to calculate the total number of days fished by each limited access herring vessel for 2007-2009. These were then aggregated by permit category. Results are presented in Table 5. Based on fishing patterns from 2007-2009, 100% observer coverage on Category A/B vessels would cost between $1.88M and $2.36M per year. The herring fishing industry has spent (in 2010 and 2011) and is likely to spend *fewer* days fishing in the future due to reductions in ACLs. Therefore, the cost of at-sea monitoring of the Category A and B vessels reported in this analysis may be interpreted as an *upper bound* of the cost of monitoring.

Category C vessels are *only* counted in Table 5 if they landed herring on a given fishing trip. The cost of observation should be regarded as a *lower bound* on the cost of monitoring the Category C vessels, when combined with Category A and B vessels. This analysis presumes that an observer would be placed to a Category C vessel only on trips that land more than 2,000 pounds of herring. The summary information presented in below (Table 6) suggests that costs could increase significantly if monitoring requirements are extended to Category C permit holders on all trips, not just herring trips.

Table 5 Aggregate Days Fished and Implied Costs of At-Sea Monitoring for 2000-2009 by Herring Permit Category

	Category A/B		Category C	
	Days	**Cost**	**Days**	**Cost**
2007	1,700	$2,040,000	151	$181,200
2008	1,564	$1,876,800	22	$26,400
2009	1,969	$2,362,800	96	$115,200

Approximately 50 additional vessels possess limited access Category C permits (25 mt possession limit), but only about 20% (or less) of these vessels were active in the herring fishery from 2007-2009 (landed 2,000 pounds or more herring). Table 6 summarizes the **total number of trips and days fished** by Category C permit holders. The Herring Category C permit holders were extracted from the Permit Databases, then cross-referenced with the Vessel Trip Report data for calendar years 2007, 2008, and 2009. Trips lasting a fraction of a day were rounded up to the next integer value. Both trips and days fished were then aggregated at the yearly level.

Based on the 2009 fishing year, 100% coverage of the Category C vessels on trips that land herring would cost approximately $115,000 per year. The number of observation days required and cost associated with those days should be regarded as a *lower bound* on the cost of monitoring the Category C vessels. It presumes that an observer could be placed on a Category C vessel before it began a herring fishing trip, through a Pre-Trip Notification. If this is not feasible, the cost of monitoring all trips by Category C vessels will be much higher, as suggested in Table 6.

Table 6 Number of Trips and Days Fished By Category C Herring Permit Holders

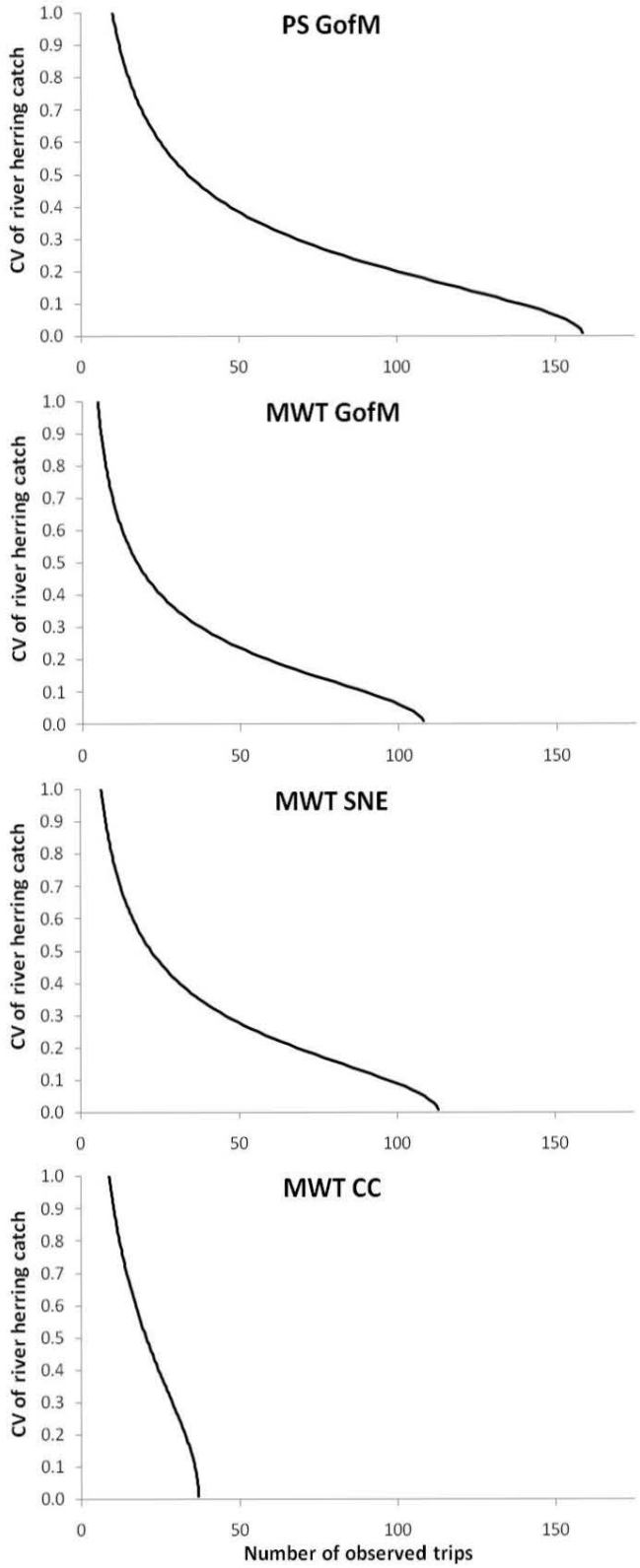
Year	Trips	Days Fished
2007	2,832	5,252
2008	3,646	6,896
2009	3,407	6,605

"Diminishing Returns"

Another important consideration in the SBRM and with all observer allocation programs is that there are diminishing returns, i.e., additional investment in observer effort yields increasingly smaller benefits in precision. As observer coverage approaches 100%, the CV goes to zero since this estimate essentially becomes a census of bycatch in the fishery (Figure 2). It is important to keep this relationship between observer coverage and precision in mind when evaluating the costs and benefits of requiring very high levels of observer coverage.

The Herring PDT notes that previous and ongoing analyses of coverage in the herring fishery suggests that a sizable increase in observer coverage does not always yield an expected increase in precision, due to the inter-annual variability in the abundance of Atlantic herring, bycatch species and how the fishery is prosecuted. The pre-trip notification system (PTNS) for the entire limited access herring fleet proposed in Amendment 5 should help to improve the predictability of fishing trips and the SBRM because the fleet's activity can be gauged on a more real-time basis.

Figure 2 Relationship Between Precision Surrounding Estimates of River Herring Bycatch and the Number of Observed Trips



4.0 IMPACTS OF ALTERNATIVE 3 (REQUIRE SBRM LEVELS AT A MINIMUM)

Impacts on Atlantic Herring

All of the alternatives related to allocating observer coverage on limited access herring vessels have the potential to improve the precision of estimates of discards or landed bycatch. In the short-term, the increased precision may prevent premature fishery closures or the chance for ACL/sub-ACL overages. Consequently herring stock abundance would be more likely to remain above management targets. In the long-term, however, increased observer coverage may only have marginal effects on herring abundance.

Impacts on Non-Target Species and Other Fisheries

Requiring SBRM levels of observer coverage for the Atlantic herring fishery would likely yield improved estimates of bycatch due to increased sample sizes. However, Alternative 3 still relies on the SBRM list of federally managed species, and therefore does not specifically address river herring bycatch. If additional funding is not available, Alternative 3 could shift sampling resources away from other fisheries. Consequently, these under-sampled fleets would have less precise estimates of bycatch, which could lead to greater management uncertainty and a poorer understanding of their impacts on the resource.

Impacts on Physical Environment and EFH

Alternative 3 would increase observer coverage levels to those specified in the SBRM amendment, at a minimum, with two funding options: federal (option 1) and federal/industry (option 2), and an additional option to certify states as observer service providers (option 1 would not authorize states; option 2 would authorize states). This alternative could lead to a decrease in herring trips if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues, although there would be less of a decrease expected as compared to 100% coverage. This decrease in fishing effort would be expected to lead to a decrease in herring fishery impacts on EFH, although the decrease in impacts would be small as the total magnitude of herring fishery impacts on EFH is minimal. If the increase in coverage is federally funded, a decrease in herring fishing, and thus in fishery impacts on EFH, would not be expected.

Impacts on Protected Resources

This measure will likely not increase or decrease effort in the fishery, but although this option has the potential to have a low positive impact on protected resources through the collection of more information on protected resources encountered by the herring fishery (in comparison to Alternative 1, the No Action alternative), the capture of rare events are not likely to increase in great magnitude in comparison to Alternative 2. Moreover, if additional funding is not available, Alternative 3 could shift sampling resources away from other fisheries, thereby decreasing the amount of knowledge of protected resources gained by observation on different types of vessels in different areas, and thereby negating the benefits of the extra coverage in the herring fishery. The impact of Alternative 3 on protected resources, overall, will therefore likely be neutral.

Impacts on Fishery-Related Businesses and Communities

Alternative 3 that would prohibit the Council from shifting SBRM Observer Coverage away from herring vessels could result in similar problems as Alternative 2, based on a potential lack of Federal funding. The impacts could be the same if industry was forced to pay for multiple days of observer coverage.

5.0 IMPACTS OF ALTERNATIVE 4 (COUNCIL-SPECIFIED TARGETS)

Alternative 4 includes a mechanism for either the NEFSC (Option 1) or the Herring PDT (Option 2) to prepare a supplemental analysis to relate SBRM fleets/coverage levels to the limited access herring vessels and evaluate the potential allocation of additional days on these vessels to achieve a 20% CV on river herring catch estimates and a 30% CV on haddock catch estimates and a 30% CV on Atlantic herring discards. The timing of the supplemental analysis would mirror the annual SBRM prioritization process, and the supplemental analysis/report would be presented to the Council by the NEFSC in conjunction with the annual SBRM Sea Day Analysis and Prioritization. The intent of this option is to provide a supplemental process to evaluate the sampling goals and performance standards identified in this amendment without compromising or formally changing the SBRM methodologies or the annual optimization process.

The PDT would not be limited to SBRM methodologies under this option. The Herring PDT could utilize different approaches (not only SBRM methods) to evaluate how to effectively increase the precision on estimates on river herring, haddock, and Atlantic herring catch on limited access herring vessels. The supplemental Herring PDT Report would evaluate CVs for river herring, haddock, and Atlantic herring catch estimates based on the previous year's data, relate the SBRM Sea Day Analysis and SBRM fleets identified in this alternative to the limited access herring vessels, provide information about the number and distribution of additional observer days to achieve the standards for the limited access herring fleet, and provide an estimate of the potential costs of those days.

SBRM allocations are based on data from July-June, and the Herring PDT analysis is based on a calendar year. This could be modified in the future if the Council adopts this approach. The analyses that the Herring PDT has provided thus far demonstrate that CVs for river herring catch estimates tend to vary substantially from year to year anyway, so timing may not be as important as simply identifying the strata (gear/area) where additional coverage would improve estimates of river herring removals from this fleet.

5.1 EXAMPLE – SUPPLEMENTAL ANALYSIS

This section provides an example of the kind of supplemental analysis that could be prepared – either by the NEFSC in conjunction with the SBRM process, or by the Herring PDT as a supplemental analysis. The following analysis utilizes methods that are similar to the SBRM, while accounting for the need to estimate river herring and haddock incidental catch (not just discarded bycatch) and target a CV for river herring that is more conservative than the current SBRM target for species that are included in the SBRM (30%). The analysis is based on 2010 observer data.

5.1.1 **Background**

An approach like SBRM can be used to accomplish the first step of setting a goal. As part of the development of the omnibus amendment to address standardized bycatch reporting methodology (SBRM), the National Working Group on Bycatch (NWGB) concluded that, "*for fishery resources, excluding protected species, caught as bycatch in a fishery, the recommended precision goal is a 20-30% CV for estimates of total discards (aggregated over all species) for the fishery; or if total catch cannot be divided into discards and retained catch then the goal is a 20-30% CV for estimates of total catch."* (NMFS 2004) As the NWGB pointed out, "Ideally, standards of precision would be based on the benefits and costs of increasing precision" (NMFS 2004). They also noted that under some circumstances, attaining the precision goal alone would not be an efficient use of the public resources. **The tradeoffs associated with increasing precision to meet a specified goal are very important to understand when developing an observer program**.

To begin to explore this issue in Amendment 5, the Herring PDT provided an *example approach* to determining levels of observer coverage necessary to meet a specific goal. These data were analyzed with formulae similar to those specified by the SBRM amendment to calculate variance and to estimate the number of trips necessary to achieve certain levels of precision for river herring over a range of desired CVs (a similar exercise will be performed for haddock and Atlantic herring in the Draft EIS). This example helps to better illustrate the trade-offs associated with the choices that would need to be made, based on goals and priorities for observer coverage as well as available resources. This exercise also shows how the SBRM approach can be used to develop a statistical approach to sampling the herring fishery to meet a specific goal under this option for observer coverage levels.

The preliminary analysis presented in this example highlights a few key points with respect to designing an observer program:

- The results suggest that, based on the SBRM approach, observer coverage should be increased in strata (gear type/area – purse seine, midwater trawl, otter trawl/GOM, GB, SNE) with high variability to reduce the CVs around catch/bycatch estimates. These are generally the strata with very limited observer coverage but high variability in estimates of river herring bycatch, but these may not be strata that one would expect to cover at higher rates.
- There are a few important caveats to consider when applying the SBRM approach to river herring – the assumptions about linearity and normality in the SBRM analysis may not hold for river herring because the distribution of the data is not normal (there is a high proportion of zeros), and there is a high degree of variability associated with the data. Seasonality (of the fishery and of river herring migrations/encounters) is also very important to consider.
- The SBRM approach considers variability associated with observed trips, but does not consider variability associated with any strata where coverage has been limited or absent. It also does not consider the variability associated with sub-sampling and extrapolation, and portside versus at-sea coverage, all of which are important especially with respect to river herring.

During 2011, the Herring PDT updated the analysis using 2010 observer data. The following analysis provides an example of the kind of information the Council would need to consider when developing recommendations about the allocation of observer days under Alternative 4. The costs of the additional days required to achieve the precision targets for river herring could be weighed by the Council against the potential benefits.

The current method for allocating observer coverage in all federally managed fisheries (SBRM) uses gear, quarter, and homeport to define fleets; and then examines the variability surrounding bycatch rates to determine the appropriate observer coverage level necessary to minimize uncertainty in discarded bycatch estimates. While this method has proven very useful for efficiently allocating limited observer resources across all fisheries, mangers of the Atlantic herring fisher had specific concerns that were not being met by the current observer allocation scheme (e.g. river herring are not included; retained bycatch are ignored).

Recently, mangers have refined their goals for monitoring this fishery. They have indicated a 20% CV for river herring removals, a 30% CV for haddock removals, and a 30% CV for Atlantic herring estimated discards as a management objective for the directed Atlantic herring fleet. To accomplish this goal, an analysis was developed that, while similar to the SBRM, differed in how it stratified catch and sampling, as well as how it defined the "directed Atlantic herring fishery."

5.1.1.1 Data and Methods

Data from the Vessel Trip Reporting system (VTR) and at-sea observer data where used to examine levels of coverage for calendar year 2010. Unlike the SBRM used in other New England fisheries, the objective here was to examine the directed herring fleet alone. To do so, the Vessel Monitoring System (VMS) was used to identify those vessels which were called into the Atlantic herring fishery (Category A, B, C vessels). Using these identified trips, both the VTR and Observer data were queried from their respective data warehouses at NMFS. This ensured that the directed herring fleet was identified, regardless of what was being fished for or landed, as long as the fishermen had identified the trip as a an Atlantic herring trip in their VMS reporting protocols.

VTR Data

Using the identified trips, vessel trip reports were collected and queried. These data reflect not only landings, but actual catch (as landings + discards) as reported by the fishermen on a trip-by trip basis. However, for purposes of this analysis, only retained catch (landings) were used in estimation. As such, this analysis not only utilized landings of Atlantic herring but used total landings of all species as well.

Observer Data

Data from the North East Fisheries Observer Program (NEFOP) for those identified Atlantic herring trips were gathered from the data warehouse located at NMFS. For this analysis, only sampled catch events were used and as such, fish designated as "kept and transferred to another vessel" were excluded as they are generally not sampled by the observer. Depending upon the species or group of interest, data were further filtered to examine catch and discards. In all cases, ratios of removals of a specific species (r below) to total kept (k below) were made, and are analogous to the "discard to kept ratio" of the SBRM methodology.

Discards of Atlantic herring typically occur as fish "fish not brought on board" (or "Fish NK" in the observer records for these trips), as fish are released from the net prior to pumping. As such, they are usually un-sampled. Therefore, unless the at-sea observer is able to document those fish as either Atlantic herring or "Herring unknown" (known Clupeid but species not known), these unidentified fish were not treated as either Atlantic herring or any other species.

Stratification

To combine VTR and NEFOP data, and to estimate removals by the directed Atlantic herring fleet, data were stratified by area and gear type. Stratification by gear included Bottom Trawls (all types), Midwater trawls (combined single and paired trawls), and Purse Seines. While the gear stratification was consistent for each of the species groups of interest, different geographic stratification was used for each group (Table 7 and Figure 3). No attempt was made at examination by quarters, or some sub component of year, because preliminary analysis showed many time-area cells with little or no coverage.

Table 7 Geographic Stratification Used in Analysis

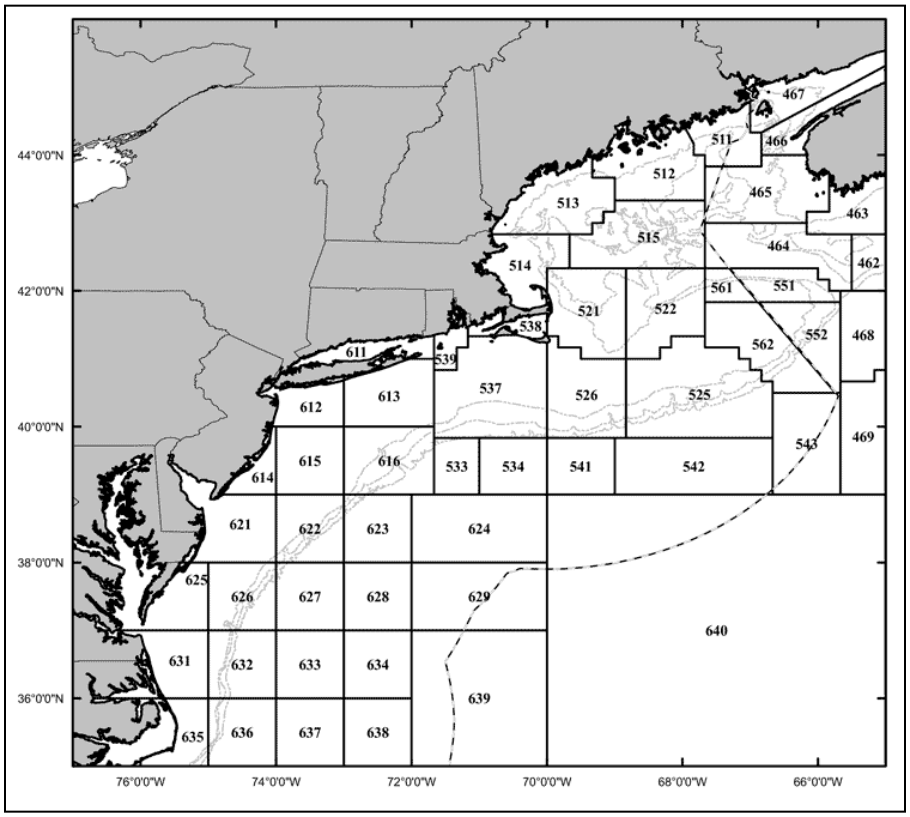
	River herring
	NMFS Stat Area
GOM	511,512, 513, 514, 515
CC	521
SNE	537, 538, 539, etc

	Haddock
	NMFS Stat Area
GOM	511,512, 513, 514, 515
GB	521, 522, 525, 526, 561, 562

	Atlantic herring
	NMFS Stat Area
GOM	511,512, 513, 514, 515
CC/GB	521, 522, 525, 526, 561, 562
SNE	537, 538, 539, etc

Note: GOM is Gulf of Maine, CC is Cape Cod (Stat area 522), GB is Georges Bank, and SNE is Southern New England

Figure 3 Northeast Region Statistical Areas



Estimations

Estimation of number of trips to achieve management goals is a three stage process. Specifically:

1. estimation of removals by strata;
2. estimation of variance associated by strata; and
3. estimation of trips needed to achieve management goals.

Total removals for each gear-area strata were estimated using a method similar to the SBRM and Lohr 1999, with a few distinct differences. Because the directed herring fleet does not "discard" fish prior to pumping into the hold, estimates of river herring and haddock were based on both discarded and retained fish. However, estimates of Atlantic herring discards were made using a method more similar to the SBRM and involved calculation of the standard "discard to kept ratio" (NEFMC, 2007). Discards of Atlantic herring typically occur as fish "fish not brought on board", or fish released from the net prior to pumping. As such, unless the at-sea observer is able to document fish as either Atlantic herring or "Herring unknown" (known Clupeid but species not known), they were excluded from the analysis.

More specially, removals by strata were estimated by:

$$\hat{R}_{ji} = \frac{\sum r_{ijh}}{\sum k_{ijh}}$$

Where R_{jh} is the bycatch rate of species group j in stratum h, r_{ijh} is the removals (pounds) for speciesgroup j within trip i in stratum h, and k_{ijh} is the kept weight (pounds) of all species within trip i in stratum h.

The variance of R can be calculated as:

$$V\left(\hat{R}_{ji}\right) = \left(\frac{N_h - n_h}{N_h}\right)\frac{1}{(n_h)\overline{k}_h^2}\left[\frac{\left(\sum r_{ijh}^2\right) + \hat{R}_{ji}^2\left(\sum k_{ijh}^2\right) - 2\hat{R}_{ji}\left(\sum r_{ijh}k_{ijh}\right)}{(n_h - 1)}\right]$$

where; n_h is the number of observed trips in stratum h; andN_h is the number ofVTR trips in stratum h.

The coefficient of variation of R can then be defined as:

$$CV\left(\hat{R}_{ji}\right) = \frac{\sqrt{V\left(\hat{R}_{ji}\right)}}{\hat{R}_{ji}}$$

The number of trips to achieve a typical management target (for example a 30 percent CV is therefore:

$$\hat{T}_{jh} = \frac{N_h\left(\frac{n_h N_h}{N_h - n_h}\right)V(\hat{R}_{jh})}{(0.09)\hat{R}^2 N_h + \left(\frac{n_h N_h}{N_h - n_h}\right)V(\hat{R}_{jh})}$$

Note that discards of Atlantic herring were estimated using the standard SBRM equations, since it was possible to rely on a discard to kept ratio (NEFMC, 2007).

5.1.1.2 Results and Discussion

After estimation of removals (or discards), variance, and number of trips needed to achieve management targets, the issue of high variability by strata was addressed. Within the SBRM is a mechanism or filter; which removes strata from coverage if their contribution to the overall removals (or discards) were less the 2% of the total (NEFMC, 2007). Application of these filter criteria are an important step in the SBRM process as it prevents strata with low removals, but high variability, from dominating the coverage rates. After discussions with other PDT members, it was decided to apply similar filters to this analysis. As such, pilot coverage was substituted instead. This pilot coverage was recommended as the greater of either 5% of the trips, or 3 trips for each filtered strata. As previously noted, pilot coverage was also recommended for strata which had zero, or few observations despite having landings.

2010 Observer Coverage

2010 observer coverage rates for river herring, haddock, and Atlantic herring are given in Table 8, Table 9, and Table 10, respectively. It should be noted that number of observed and total number of trips will vary as the geographic stratification are different by species group.

Overall, observer coverage in both number of trips and percentage were higher in 2010 than in reports for other years (Cieri, et al. 2008. Wigley et al, 2009). Implementation of 100% observer coverage in the groundfish zero mortality areas has significantly improved coverage rates even in the adjacent areas. This is due in part to the presence of an at-sea observer on trips where the captain *may* be going into Closed Area I. However, there are still a number of strata with very low to almost no coverage; including bottom trawl gears in Southern New England and the Gulf of Maine.

Table 8 Landings Total Trips by Fishery, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (River Herring)

Total Trips by fishery

Trips	Gear			
Area	BT	PS	MWT	Total
CC	0	1	37	38
GOM	143	159	108	410
SNE	60	[redacted]	113	173
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
CC	0	20,000	12,298,341	12,318,341
GOM	763,766	16,567,910	40,094,010	57,425,686
SNE	6,029,289	[redacted]	42,222,557	48,251,846
Total	6,793,055	16,587,910	94,614,908	117,995,873

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
CC	0	9	5,577	5,587
GOM	346	7,514	18,183	26,043
SNE	2,734	[redacted]	19,149	21,883
Total	3,081	7,523	42,909	53,513

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
CC			22	22
GOM	5	21	31	57
SNE	3		24	27
Total	8	21	77	106

% Coverage

	Gear		
Area	BT	PS	MWT
CC	[redacted]		59
GOM	3	13	29
SNE	5	[redacted]	21

[redacted] Improbable

[redacted] No coverage

Table 9 Landings Total Trips by Fishery, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Haddock)

Total Trips by fishery

	Gear			
Area	BT	PS	MWT	Total
GB	3	3	126	132
GOM	143	159	110	412
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
GB	34,138	200,000	43,452,304	43,686,442
GOM	763,766	16,567,910	41,249,924	58,581,600
Total	797,904	16,767,910	84,702,228	102,268,042

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
GB	15	91	19,706	19,812
GOM	346	7,514	18,707	26,568
Total	362	7,604	38,414	46,380

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
GB	2	[redacted]	88	90
GOM	5	21	30	56
Total	7	21	118	146

% Coverage

	Gear		
Area	BT	PS	MWT
GB	67	[redacted]	70
GOM	3	13	27
	[redacted]	Improbable	

Table 10 Landings Total Trips by Fishery, Number of Observed Trips, and Percentage Coverage by At-Sea Observers by Strata for 2010 (Atlantic Herring)

Total Trips by fishery

Trips	Gear			
Area	BT	PS	MWT	Total
CC/GB	3	3	126	132
GOM	143	159	108	410
SNE	60		113	173
Total	203	160	258	621

Pounds Landed all species

	Gear			
Area	BT	PS	MWT	Total
CC/GB	34,138	200,000	43,452,304	43,686,442
GOM	763,766	16,567,910	40,534,010	57,865,686
SNE	7,586,649		42,811,557	50,398,206
Total	8,384,553	16,767,910	126,797,871	151,950,334

MT landed all species

	Gear			
Area	BT	PS	MWT	Total
CC/GB	15	91	19,706	19,812
GOM	346	7,514	18,383	26,243
SNE	3,441	0	19,416	22,856
Total	3,803	7,604	57,505	68,912

Number of Observed trips

	Gear			
Area	BT	PS	MWT	Total
CC/GB	2	0	88	90
GOM	6	21	31	58
SNE	3		24	27
Total	11	21	143	175

% Coverage

	Gear		
Area	BT	PS	MWT
CC/GB	67	0	70
GOM	4	13	29
SNE	5		21

Improbable

No coverage

River Herring Estimations and Trips Needed

Estimates of river herring removals and CV by strata for the directed fleet are given in Table 11. Overall, the variation in the estimates of removals for River herring was low, do in no small part by the high level over coverage. The CV for river herring was 36%; compared to 20% for the management objective. Total trips needed to achieve the management objective of a 20% CV, fishery wide, are given in Table 14. Trips needed to achieve a 20% CV fishery-wide are approximately 160 more than what was sampled in 2010. Surprisingly, the Gulf of Maine/Purse Seine stratum required the most trips (105 trips, or 66% coverage).

Table 11 Estimated Removals, Proportion of Total Removals, and CV by Strata for River Herring (2010)

Estimate (lbs.)

Area	BT	PS	MWT	Total
CC			96	96
GOM	1,053	4,548	144,333	149,934
SNE			15,885	15,885
Total	1,053	4,548	160,315	165,915

Proportion of total removal

Area	BT	PS	MWT	Total
CC			0.00	0.00
GOM	0.01	0.03	0.87	0.90
SNE			0.10	0.10
Total	0.01	0.03	0.97	1.00

CV

Area	BT	PS	MWT
CC			0.72
GOM		0.72	0.41
SNE			0.54

Less then 2% of total

Haddock Estimation and Trips Needed

Estimation of haddock removals for 2010 were approximately 222,524 lbs., with a CV of 28% (Table 12). This CV is slightly less than the CV management target of 30%. As a result, 40 less trips are needed to achieve a 30% CV (Table 14). Almost all of this coverage is for the Georges bank/Cape Cod midwater trawl fleet; with the rest as pilot coverage rates.

Table 12 Estimated Removals, Proportion of total removals, and CV by Strata for Haddock (2010)

Estimate (lbs.)

Area	BT	PS	MWT	Total
GB	66		218,410	218,476
GOM	356	2,852	840	4,048
Total	422	2,852	219,250	222,524

Proportion of total removal

Area	BT	PS	MWT	Total
GB	0.00		0.98	0.98
GOM	0.00	0.01	0.00	0.02
Total	0.00	0.01	0.99	1.00

CV

Area	BT	PS	MWT
GB	0.90		0.28
GOM	0.59	0.69	0.54

Atlantic Herring Estimation and Trips Needed

Overall, discards of Atlantic herring appear to be pretty low; approximately 360,000 lbs. or 0.25% of the Atlantic herring catch as reported from the 2010 IVRs (Table 13). In addition, there was a low amount of variability; CVs fishery-wide were 20%. As such, number of trips needed to achieve a management target of 30% CV is approximately 65 less than what occurred in 2010 (Table 14).

Table 13 Estimated Removals, Proportion of total removals, and CV by Strata for Atlantic Herring (2010)

Estimate (lbs.)

Area	BT	PS	MWT	Total
CC/GB	0		67,591	67,591
GOM	0	46,625	91,189	137,814
SNE	47,150	0	114,638	161,788
Total	47,150	46,625	273,419	367,194

Proportion of total removal

Area	BT	PS	MWT	Total
CC/GB			0.18	0.18
GOM	0.00	0.13	0.25	0.38
SNE	0.13		0.31	0.44
Total	0.13	0.13	0.74	1.00

CV

Area	BT	PS	MWT
CC/GB			0.24
GOM		0.33	0.38
SNE	0.82		0.40

Table 14 Number of Trips Needed by Strata and Percent Coverage for River Herring Catch, Haddock Catch, and Atlantic Herring Discards

A) River Herring

Trips needed

Area	BT	PS	MWT	Total
CC	3	3	3	9
GOM	7	105	68	180
SNE	3		75	78
total	10	108	145	267

% coverage

Area	BT	PS	MWT
CC		300	8
GOM	5	66	63
SNE	5		66

B) Haddock

Trips needed

Area	BT	PS	MWT	Total
GB	3	3	86	86
GOM	7	8	6	21
total	10	11	91	107

% coverage

Area	BT	PS	MWT
GB	100	100	68
GOM	5	5	5

Pilot coverage
improbable

C) Atlantic Herring

Trips needed

Area	BT	PS	MWT	Total
CC/GB	3	3	6	12
GOM	3	25	42	70
SNE	17		37	54
total	6	28	85	136

% coverage

Area	BT	PS	MWT
CC/GB	100	100	5
GOM	2	16	39
SNE	28		32

Combining Trips Across Areas and Species

Fortunately, at-sea observer sampling targeting one species group can also be used to document catch and bycatch of other species on the same trip. Therefore, for each stratum, the highest number of trips required to achieve the three management goals was used. However in the case of river herring, the geographic stratification differences in management are 1B and 3 need to be accounted for (See *Stratification* above). To accomplish this, a proration in number of trips needed in the Cape Cod (for River herring) and the Cape Cod/Georges bank (for haddock) strata was used. This proration was based on the percentage of landings which occur in those areas (Table 15).

Table 15 Combined Trips, Average Length of Trips, and Total Observer Days Needed to Meet CV Targets by Strata (Based on 2010)

Trips needed

Area	BT	PS	MWT	Total
CC	3	3	15	21
GB	7	[redacted]	71	78
CC/GB	10	3	86	99
GOM	7	105	68	180
SNE	17	[redacted]	75	92
total	34	108	228	371

Average days per trip

Area	BT	PS	MWT	Total
CC	2	3	2	7
GB	3	[redacted]	3	6
GOM	2	2	2	6
SNE	2	[redacted]	4	6
total	4	2	6	12

Total days

Area	BT	PS	MWT	Total
CC	6	9	30	45
GB	21	[redacted]	212	234
CC/GB	27	9	243	279
GOM	11	211	135	357
SNE	34	[redacted]	298	332
total	72	220	676	968

Note: This only includes at-sea time, and not transport to dock, set-up time, etc. for observers. Also, CC and GB are listed singly and combined (see text) as CC/Georges Bank.

5.1.1.3 Conclusions

In general, the limited access herring fishery experienced higher levels of observer coverage in 2010 than in previous years (Cieri et al. 2008 and Wigley et al. 2009), and a lower amount of variability was seen as well. This analysis indicates a lower level of river herring removals, haddock removals, and Atlantic herring discards than previous estimates. In addition, the degree of variability was also less.

It should be noted, however, that the year to year variability is not captured in this method. Cieri et al. 2008 and others have documented a high degree of variability within the same strata across years. Undoubtedly, fishing patterns, management actions, and availability of the fish to the fishery affect the estimates of removals and the variability associated with that estimate. As such should the levels of coverage suggested here be achieved, there is no guarantee that management targets on CV will be met.

It is important to note the lack of coverage in the southern New England bottom trawl fishery for Atlantic herring in 2010. In other analyses, this fleet has had both a high degree of variability and high estimates of removals for River herring. However; because there was no coverage in this area in 2010, the analysis suggest only pilot coverage should occur in 2012. Mangers may want to increase coverage in this area ad-hoc, given the results of prior analyses.

Also, this analysis is an example only of the types of analyzes that can be brought to bear on the issue of bycatch in the directed herring fishery. It should be viewed as a supplement, not a replacement, of the SBRM. However, using this sort of analysis can allow managers to tailor at-sea observer coverage to meet the species management goals and needs of the herring fishery.

5.2 IMPACTS OF ALTERNATIVE 4 ON VECS

Impacts on Atlantic Herring

All of the alternatives related to allocating observer coverage on limited access herring vessels have the potential to improve the precision of estimates of discards or landed bycatch. In the short-term, the increased precision may prevent premature fishery closures or the chance for ACL/sub-ACL overages. Consequently, Atlantic herring stock abundance would be more likely to remain above management targets. In the long-term, however, increased observer coverage may only have marginal effects on herring abundance.

Impacts on Non-Target Species and Other Fisheries

Alternative 4 would allocate additional observer coverage to specifically address the bycatch of river herring and haddock. This would lead to a greater understanding and reliability of bycatch estimates of these species in this fishery. Alternative 4 would not impact the SBRM allocation scheme, and would therefore not cause other fisheries to be under-sampled.

Impacts on Physical Environment and EFH

Alternative 4 would allocate observer coverage based on Council-specified targets and priorities, with two funding options: federal (option 1) and federal/industry (option 2), and an additional option to certify states as observer service providers (option 1 would not authorize states; option 2 would authorize states). This alternative would allow for additional analyses and recommendations from either the NEFSC or the Herring PDT to supplement SBRM coverage recommendations. As above, this alternative could lead to a

decrease in herring trips if industry funding is required and vessels are unwilling to absorb the cost of observer coverage given expected revenues, although there would be less of a decrease expected as compared to 100% coverage. This decrease in fishing effort would be expected to lead to a decrease in herring fishery impacts on EFH, although the decrease in impacts would be small as the total magnitude of herring fishery impacts on EFH is minimal. If the increase in coverage is federally funded, a decrease in herring fishing, and thus in fishery impacts on EFH, would not be expected.

Impacts on Protected Resources

Similar to the impacts of Alternative 3, Alternative 4 has the potential to have a low positive impact on protected resources through the collection of more information on protected resources encountered by the herring fishery (in comparison to Alternative 1, the No Action alternative). The measure is also not likely to increase or decrease effort in the fishery, thereby not increasing or decreasing the chance of encounters of protected resources. The capture of rare events, however, may or may not increase in magnitude in comparison to Alternative 2, depending on the specifications of the Council. Unlike Alternative 3, however, the SBRM allocation would not change under this alternative, and therefore it would not shift sampling resources away from other fisheries (thereby not decreasing the amount of knowledge of protected resources gained by observation on different types of vessels in different areas). The impact of Alternative 4, overall, is therefore likely to be a low positive impact.

Impacts on Fishery-Related Businesses and Communities

Alternative 4 would negatively impact herring-related businesses if this resulted in the industry having to pay for additional observer coverage. Like Alternative 2, it also implies that the limited access Atlantic herring fishing vessels have a disproportionate and greater impact on river herring and haddock than do other fisheries/vessels. While the extra coverage could provide the benefit of proving that their impact is the equivalent to other types of fishing, this proof could come at the financial burden of paying for extra observer coverage.

Category A/B Versus Category C Vessels

The example analysis provided in this document utilized an SBRM-like approach based on 2010 fishing data. Trip records were pulled for the limited access herring fishery, that is, the Category A/B and Category C vessels on trips when they were declared into the herring fishery. Category C vessels are primarily bottom trawl vessels that fish in a variety of fisheries and may only catch herring seasonally and/or incidentally, but they were incorporated into this analysis because they are part of the 100 vessels that represent the limited access herring fishery, the vessels to which the observer allocation alternatives are intended to apply. One of the benefits of the approach embedded in this alternative is that the Council has the flexibility to prioritize and allocate coverage based on the strata it deems most appropriate or most important at the time. If the Council selects this alternative and determines that Category C vessels should not be incorporated into the analysis or the allocation of observer coverage, then it can prioritize coverage for the A/B vessels and the PDT can conduct the supplemental analysis accordingly. At this point, however, the C trips that were declared into the herring fishery are incorporated because they represent the limited access trips for 2010; it is expected that the notification requirements proposed in this amendment will help to better target directed herring trips in the future so that the allocation of observers in the fishery can be optimized.

Appendix IV

Herring PDT Analysis: Development of Measures to Address River Herring Bycatch

A: July 2010
B: August 30, 2010 (Updated)
C: August 30, 2010 Supplemental Material
D: December 20, 2010 – Final Draft Spatial

DRAFT

Identification of river herring hotspots at sea using multiple fishery dependent and independent datasets

Prepared for the Atlantic Herring PDT

by

Jamie Cournane[1]

Steven Correia[2]

[1]University of New Hampshire and Environmental Defense Fund

[2]Massachusetts Division of Marine Fisheries

July 2010

DRAFT

Background

At its May 2010 meeting, the New England Fisheries Management Council Herring Oversight Committee tasked the Plan Development Team (PDT) with identifying river herring hotspots as part of the analysis for Amendment 5 to the Atlantic Herring fishery management plan (FMP). Specifically, one of the objectives for Amendment 5 of the FMP is to address river herring bycatch in the Atlantic herring, *Clupea harengus*, fishery.

Here, the term "river herring" refers to alewife, *Alosa pseudoharengus*, and blueback herring*, Alosa aestivalis*. This analysis combines available data on both species to identify river herring hotspots. Furthermore, this work differs from other studies on the bycatch of river herring in ocean fisheries (Shepherd 1986, Cieri et al. 2008, Wigley et al. 2009) because it incorporates fishery dependent and independent data. The following is a summary of the method and analysis developed by the PDT to identify river herring hotspots.

Study Area

The study area includes the Atlantic herring fishery management plan areas that overlap the Eastern US Continental shelf (Fig. 1).

Datasets and Data Selection

Multiple data sources are used in this analysis to identify river herring hotspots at sea. These sources include fishery dependent (Vessel Trip Reports, VTR and Northeast Fishery Observer Program, NEFOP) and fishery independent (National Marine Fisheries Service, NMFS bottom-trawl surveys) datasets (Tables 1-3). The most recent 5 years (2005-2009) of fishery dependent data and 15 years (1994-2008) of fishery independent are pooled separately by dataset in the analysis.

Data from directed herring trips were selected from VTR and NEFOP databases and grouped by quarter: 1, 2, 3, and 4 (Tables 1 and 2). Here, directed herring trips were defined as 2,000 lbs of kept Atlantic herring on a trip. Data from other non-directed trips is not included in the analysis, but may become the scope of future examination. In addition, fishery dependent data included three broad gear categories: bottom otter-trawl, purse seine, and mid-water trawl (combining single and pair mid-water trawls).

River herring data from observed directed herring trips (NEFOP) were presence/absence and weight (lbs) from each haul or set. Data from the Massachusetts Division of Marine Fisheries and the Maine Department of Marine Resources portside surveys were excluded because spatial information was not available for all years and all trips.

Selected river herring data from NMFS bottom-trawl surveys included presence/absence and the number of individuals found at each sampling location. Surveys were separated by season: winter, spring, and fall (Tables 3 and 4).

Methods

Fishing Effort and River Herring Bycatch

To understand where and when the directed herring fishery operated throughout the fishing year, quarterly maps and tables of the number of trips per statistical area were constructed using VTRs (Figs. 2-5, Appendix Tables A.1-A.4). Fishing effort was approximated by the number of trips within a statistical area. Quarterly maps of fishing effort by statistical areas were color-coded from hot (red) to cool (blue) to identify fishing effort concentration areas.

These maps were overlaid with quarterly NEFOP data on river herring bycatch events from observed hauls and sets. Circles of increasing size represent the magnitude of the bycatch event. These bycatch events were binned into circles of increasing size using all years and quarters combined and then mapped separately by quarter.

Hotspots

Seasonal NMFS bottom-trawl surveys were used to identify river herring "hotspot" areas (Appendix Figure A.1). Analyses for the winter, spring, and fall surveys were conducted separately for two spatial stratification schemes:

- fisheries statistical areas (Fig. 1) and
- survey strata (Appendix Figs. A.2- A.5).

Regardless of the spatial stratification scheme, at least 10 tows per strata were required for inclusion in the analysis. Strata with less than 10 tows were omitted from the analysis.

For each seasonal survey and stratification scheme, two metrics were used to determine hotspots:

- percent occurrence and
- median Q index.

Within each spatial stratum, percent occurrence was defined as the count of tows with river herring present divided by the total tows. For example if for a given area, the number of tows was 100, and out of those 100 tows 66 tows detected river herring. The percent occurrence for that area was 66%. The percent occurrence for each spatial strata was used for ranking.

The Q index standardizes the number of river herring caught per tow to reduce the effect of annual sampling variation and differences in sample size among years. The Q index can be interpreted as reflecting the density of river herring within a given spatial strata. Because the NMFS bottom trawl survey has predefined survey strata, results for the Q index that ignore the survey strata (i.e., results of the Q index for each statistical area) should be interpreted cautiously and may not reflect river herring density in a

given area because such methods violate assumptions of the a priori survey sampling design. The median of the Q-index for each spatial strata was used for ranking hotspots.

The strata for each stratification scheme (i.e., statistical areas or survey strata) were ranked using each metric and recorded in respective tables, plots and maps (Figs.6-8, Appendix Tables A.5-A.10, Figs. A.6- A.14). Maps of ranked areas were color-coded from hot (red) to cool (blue or purple) to identify river herring hotspot areas. These maps were overlaid with quarterly NEFOP data on river herring bycatch from observed hauls and sets based on the timing of the NMFS bottom-trawl surveys (Table 4).

Results

Fishing Effort and River Herring Bycatch

Visual differences in the spatial and temporal distribution of directed herring trips were evident from maps of fishing effort (Figs. 2-5). In general, fishing effort shifted from the northern Mid-Atlantic Bight and southern New England waters in quarter 1 to southern New England waters and the Gulf of Maine in quarter 2 (Figs. 2-3). In quarter 3, fishing effort concentrated in the Gulf of Maine and Georges Bank (Fig. 4). Then during quarter 4, fishing effort spanned the Gulf of Maine and southern New England waters (Fig. 5).

Using NEFOP haul and set data, river herring bycatch events were inspected by quarter. River herring bycatch events in quarter 1 included areas in Ipswich Bay, off the back of Cape Cod, and in the northern Mid-Atlantic Bight (Fig.2). In quarter 2, river herring bycatch events occurred in the northern Gulf of Maine, off the back of Cape Cod, and the Mid-Atlantic Bight (Fig. 3). In quarter 3, bycatch events included areas in the northern Gulf of Maine (Fig. 4). For quarter 4, bycatch events included the northern Gulf of Maine, Ipswich Bay, Massachusetts Bay, the back of Cape Cod, south of Martha's Vineyard, and near Block Island (Fig. 5).

Hotspots

Results include river herring hotspot areas ranked in tables, plots, and maps:

- percent occurrence by statistical area (Figs. 6-8, Appendix Tables A.5-A.7)
- percent occurrence by survey strata (Appendix Figs. A.6-A.8, Tables A.8-A.10
- median Q index by statistical area (Appendix Figs. A.9-A.11, Tables A.5-A.7)
- median Q index by survey strata (Appendix A.12-A.14, Tables A.8-A.10).

Each of these above combinations produced different hotspot maps. These seasonal maps were overlaid with observed river herring bycatch events by quarters. Although the timing of the quarterly observed river herring bycatch events did not perfectly match the timing of the seasonal NMFS bottom-trawl surveys (Table 4), they could be used to reference identified hotspot areas and in future analysis.

Tables

Q1-4	Gear Category			
Year	OT	PR	PS	ALL
2005	77	774	200	1051
2006	150	739	175	1064
2007	414	389	365	1168
2008	109	304	246	659
2009	203	406	225	834
ALL	953	2612	1211	**4776**

Q1	Gear Category			
Year	OT	PR	PS	ALL
2005	14	127	0	141
2006	67	160	0	227
2007	154	176	0	330
2008	63	128	0	191
2009	99	171	0	270
ALL	397	762	0	**1159**

Q2	Gear Category			
Year	OT	PR	PS	ALL
2005	8	161	25	194
2006	4	177	27	208
2007	1	105	52	158
2008	0	42	53	95
2009	7	30	53	90
ALL	20	515	210	**745**

Q3	Gear Category			
Year	OT	PR	PS	ALL
2005	16	294	142	452
2006	32	265	136	433
2007	224	7	258	489
2008	23	18	191	232
2009	42	75	156	273
ALL	337	659	883	**1879**

Q4	Gear Category			
Year	OT	PR	PS	ALL
2005	39	192	33	264
2006	47	137	12	196
2007	35	101	55	191
2008	23	116	2	141
2009	55	130	16	201
ALL	199	676	118	**993**

Table 1: Number of directed herring trips separated by gear, year and quarter. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Q1-4	Gear Category			
Year	OT	PR	PS	ALL
2005	15	465	95	575
2006	64	120	0	184
2007	59	75	27	161
2008	8	209	69	286
2009	35	437	97	569
ALL	181	1306	288	**1775**

Q1	Gear Category			
Year	OT	PR	PS	ALL
2005	0	56	0	56
2006	36	75	0	111
2007	37	35	0	72
2008	4	63	0	67
2009	27	91	0	118
ALL	104	320	0	**424**

Q2	Gear Category			
Year	OT	PR	PS	ALL
2005	0	65	5	70
2006	0	6	0	6
2007	0	9	0	9
2008	0	50	25	75
2009	0	56	39	95
ALL	0	186	69	**255**

Q3	Gear Category			
Year	OT	PR	PS	ALL
2005	13	175	75	263
2006	16	28	0	44
2007	11	3	24	38
2008	4	18	38	60
2009	4	122	54	180
ALL	48	346	191	**585**

Q4	Gear Category			
Year	OT	PR	PS	ALL
2005	2	169	15	186
2006	12	11	0	23
2007	11	28	3	42
2008	0	78	6	84
2009	4	168	4	176
ALL	29	454	28	**511**

Table 2: Observed hauls from directed herring trips separated by gear, year and quarter. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Source: NEFOP Database 2005-2009.

	Season			
Year	Winter	Spring	Fall	ALL
1994	79	299	288	666
1995	120	288	298	706
1996	114	291	263	668
1997	109	293	287	689
1998	116	321	294	731
1999	121	291	296	708
2000	107	292	294	693
2001	146	280	283	709
2002	138	274	289	701
2003	70	271	281	622
2004	119	285	278	682
2005	82	261	279	622
2006	103	292	306	701
2007	117	316	295	728
2008		297	306	603
ALL	1541	4351	4337	**10229**

Table 3: Number of tows from seasonal research surveys separated by year and season. Source: NMFS bottom-trawl surveys 1994-2008.

		NMFS BTS Seasons		
Month	Fishing Quarter	Winter	Spring	Fall
1	1	16		
2	1	1498	9	
3	1	27	2402	
4	2		1916	
5	2		24	
6	2			
7	3			
8	3			
9	3			2262
10	4			1970
11	4			105
12	4			

Table 4: Number of tows from seasonal research surveys separated month, fishing quarter, and survey season. Note that spring and fall surveys overlap multiple fishing quarters. Source: NMFS bottom-trawl surveys 1994-2008.

Figures

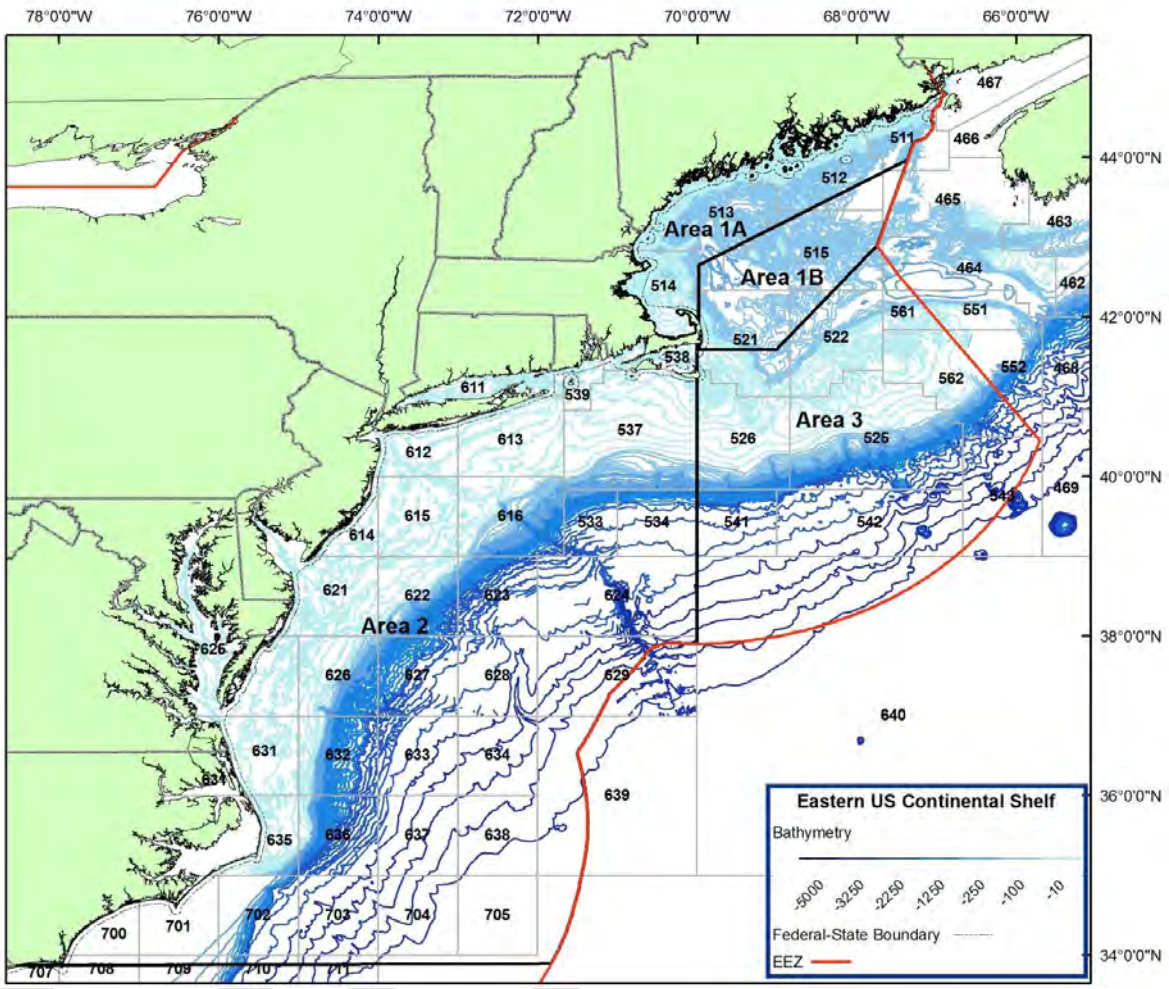


Figure 1: Study area of the Eastern US Continental Shelf. Overlapping Atlantic herring fishery management plan areas (Area 1A, 1B, 2, and 3) and fisheries management statistical areas (400-700s) indicated.

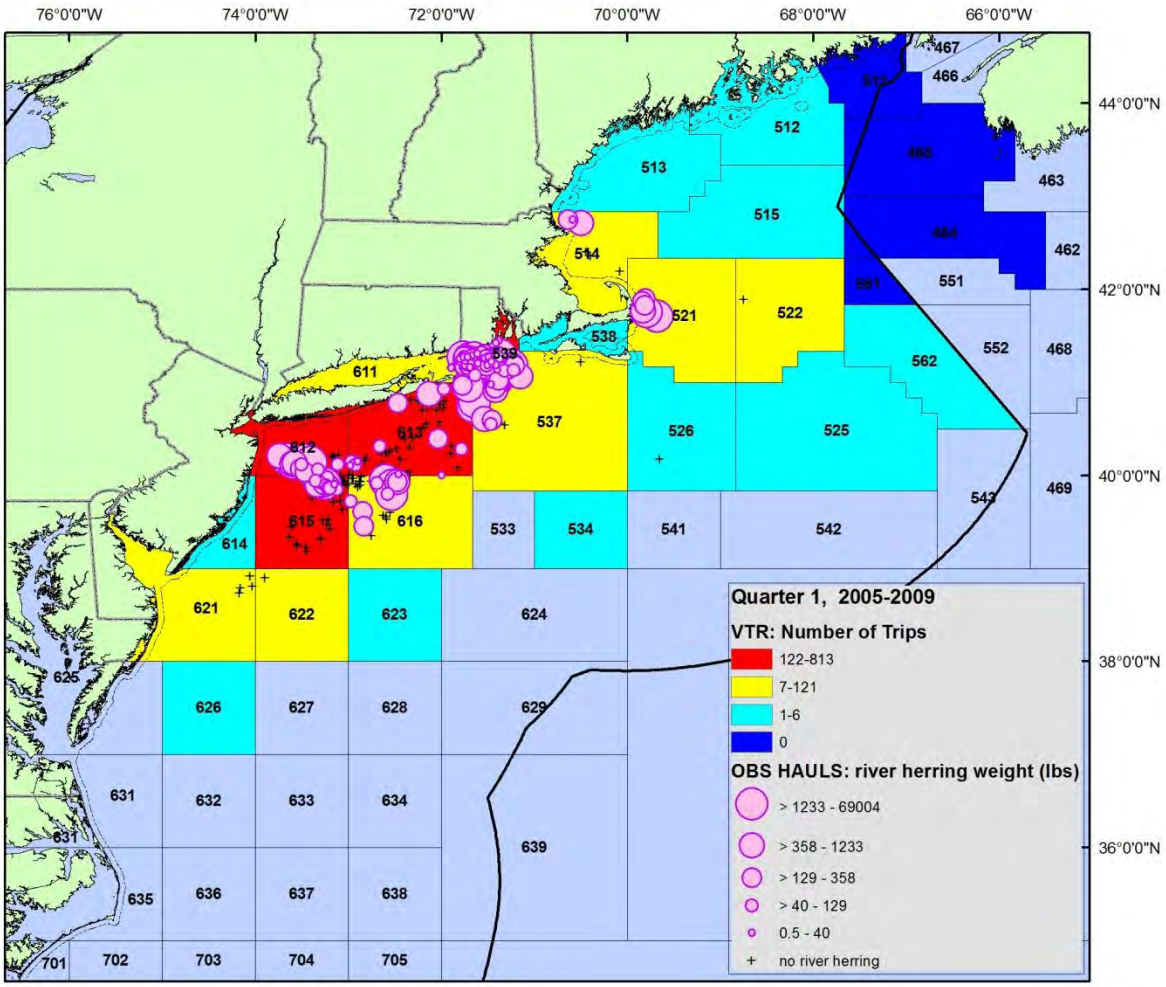


Figure 2: Reported trips (VTR) and observed hauls and sets (OBS HAULS) from quarter 1, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 122-813 (red), 7-121 (yellow), 1-6 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

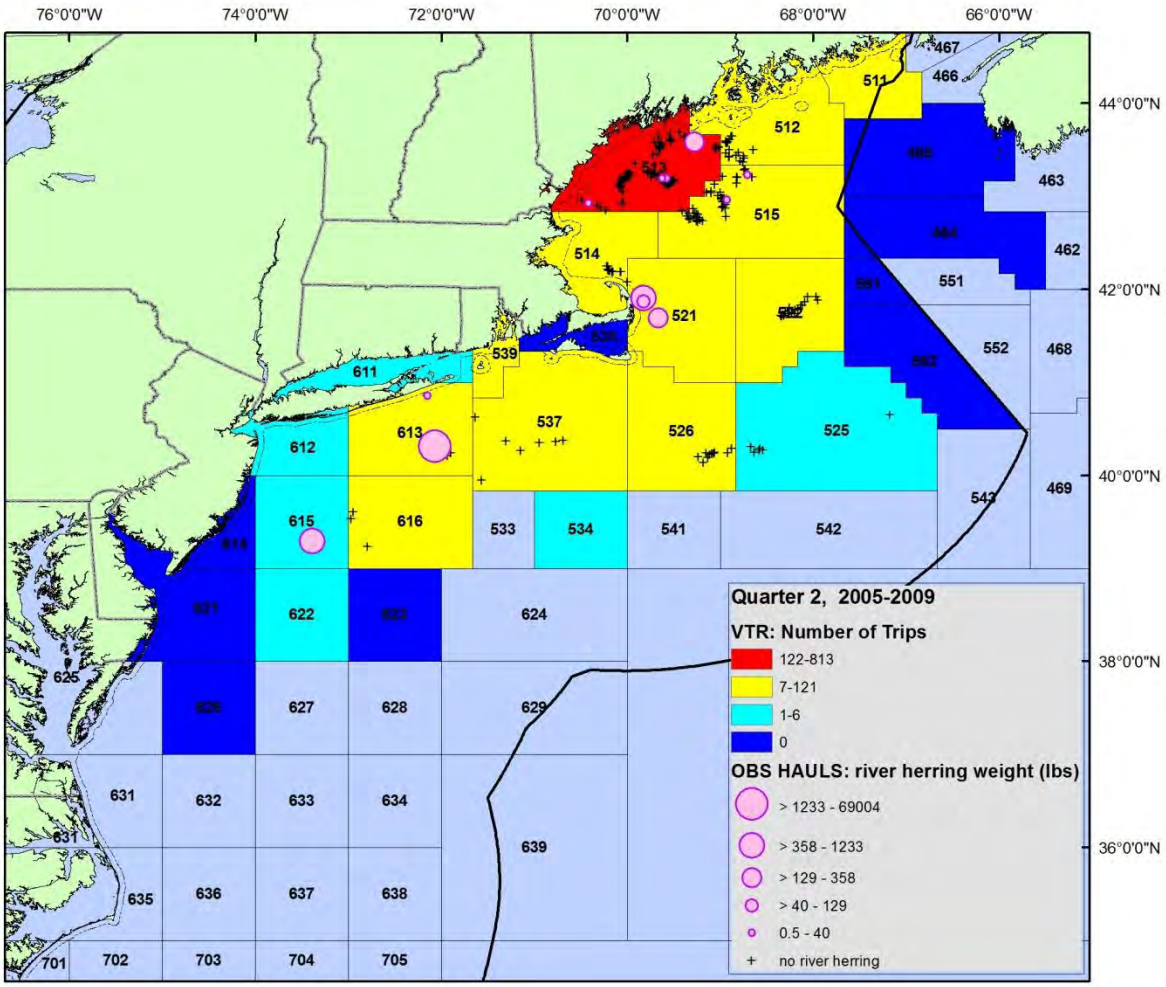


Figure 3: Reported trips (VTR) and observed hauls and sets (OBS HAULS) from quarter 2, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 122-813 (red), 7-121 (yellow), 1-6 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

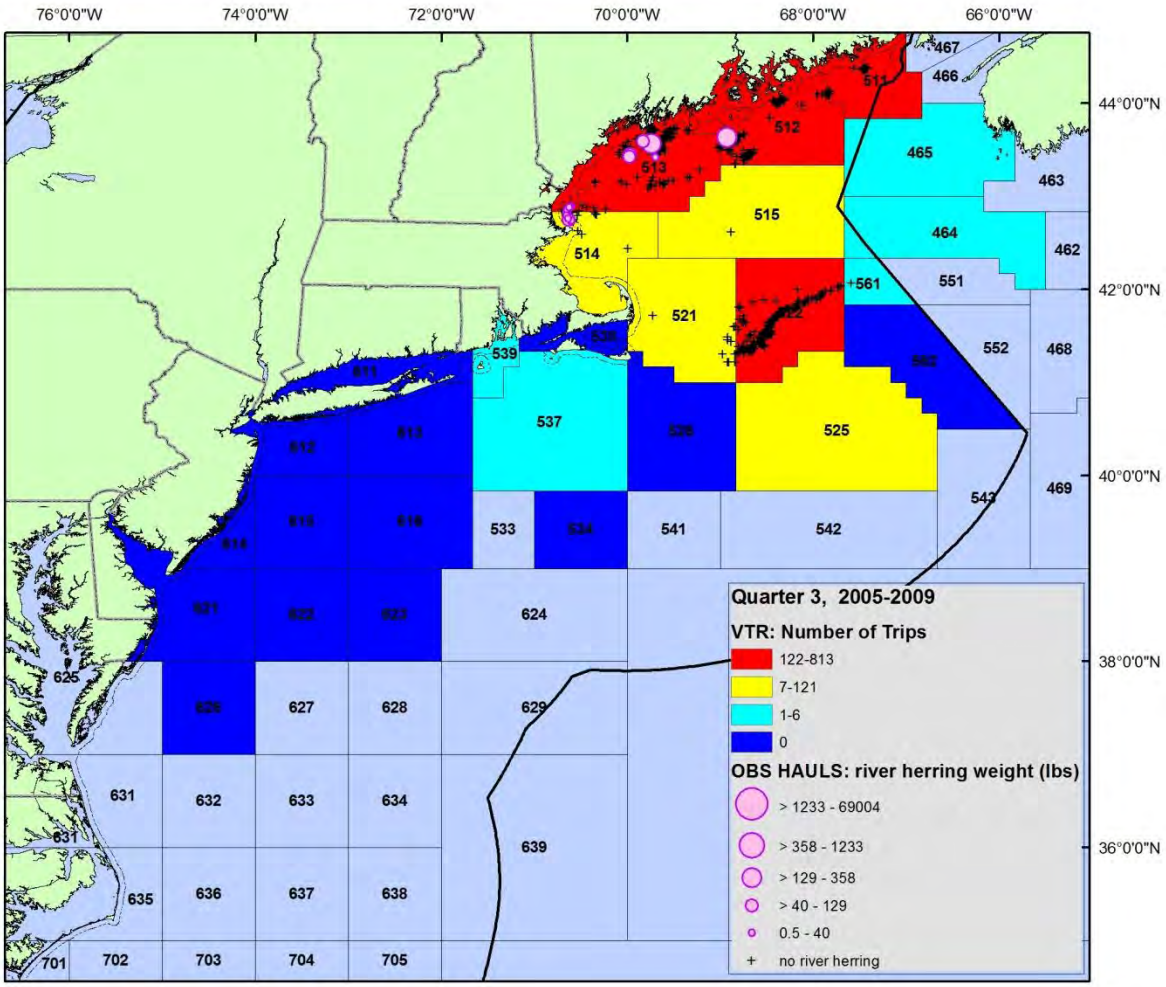


Figure 4: Reported trips (VTR) and observed hauls and sets (OBS HAULS) from quarter 3, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 122-813 (red), 7-121 (yellow), 1-6 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

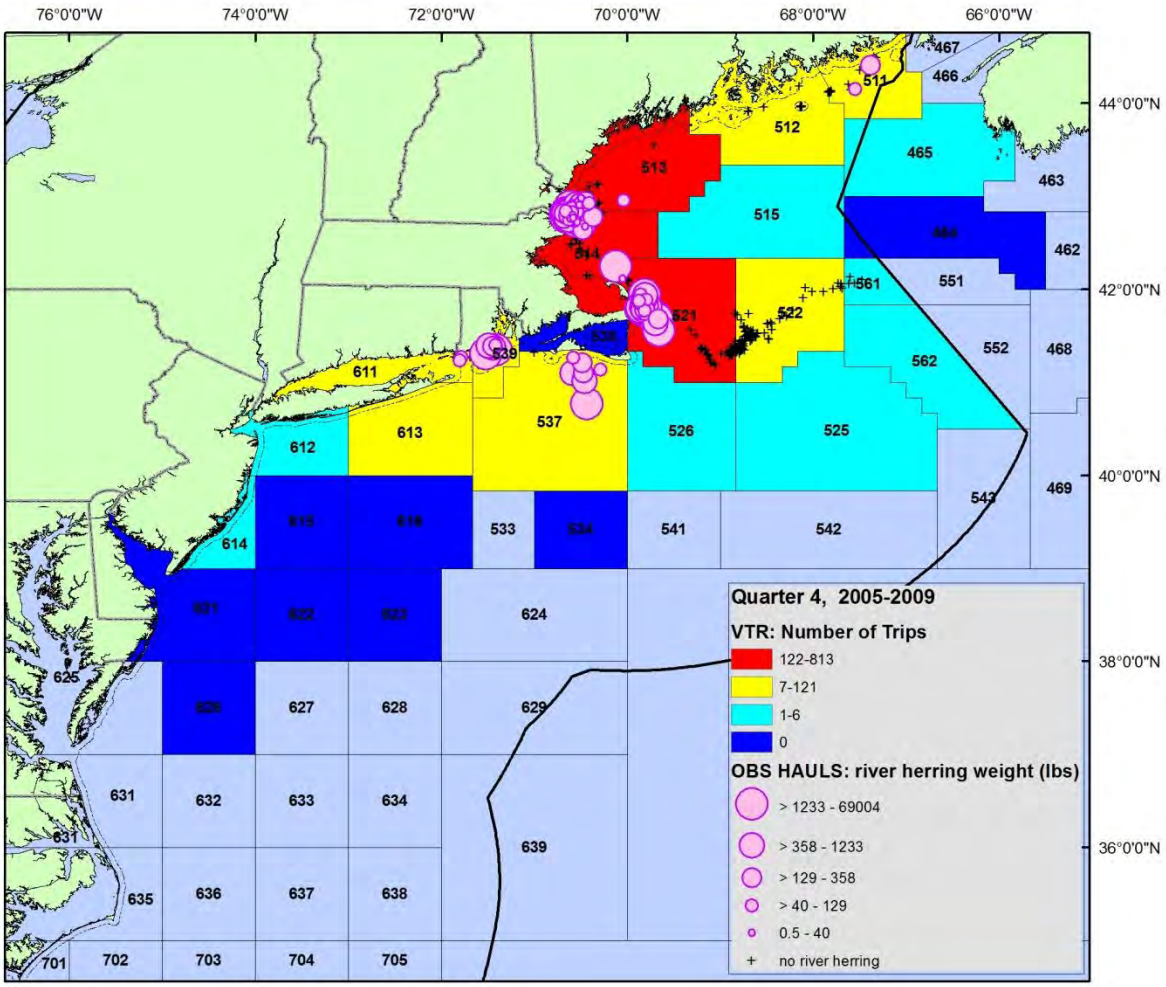


Figure 5: Reported trips (VTR) and observed hauls and sets (OBS HAULS) from quarter 4, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 122-813 (red), 7-121 (yellow), 1-6 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

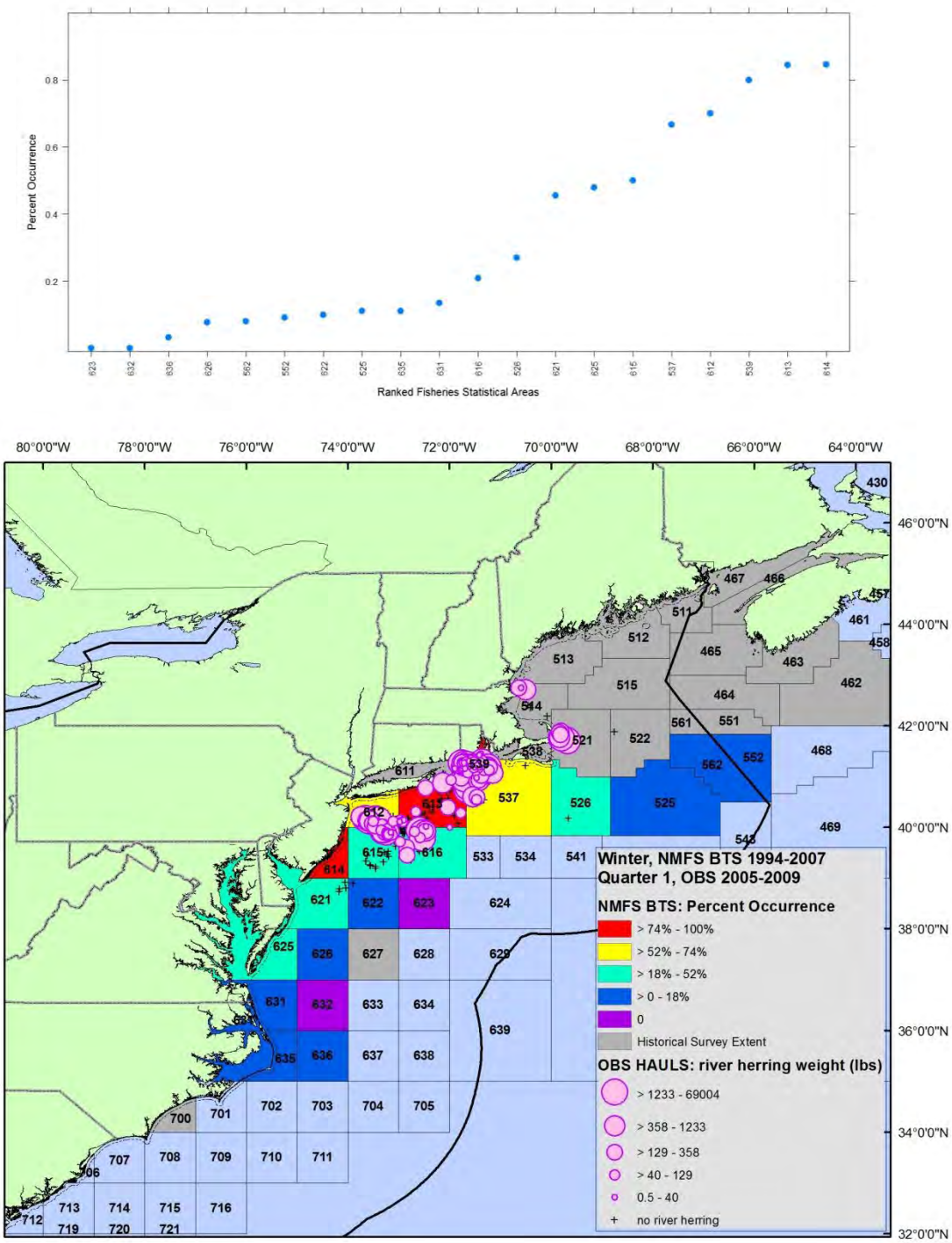


Figure 6: Percent occurrence of river herring in winter research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by statistical area grouped from >74-100% (red), >52-74% (yellow), >18-52% (aqua), >0-18% (dark blue) and 0% (purple) (bottom). Ranks are based on river herring percent occurrence values in the spring research surveys. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2007 and NEFOP Database 2005-2009.

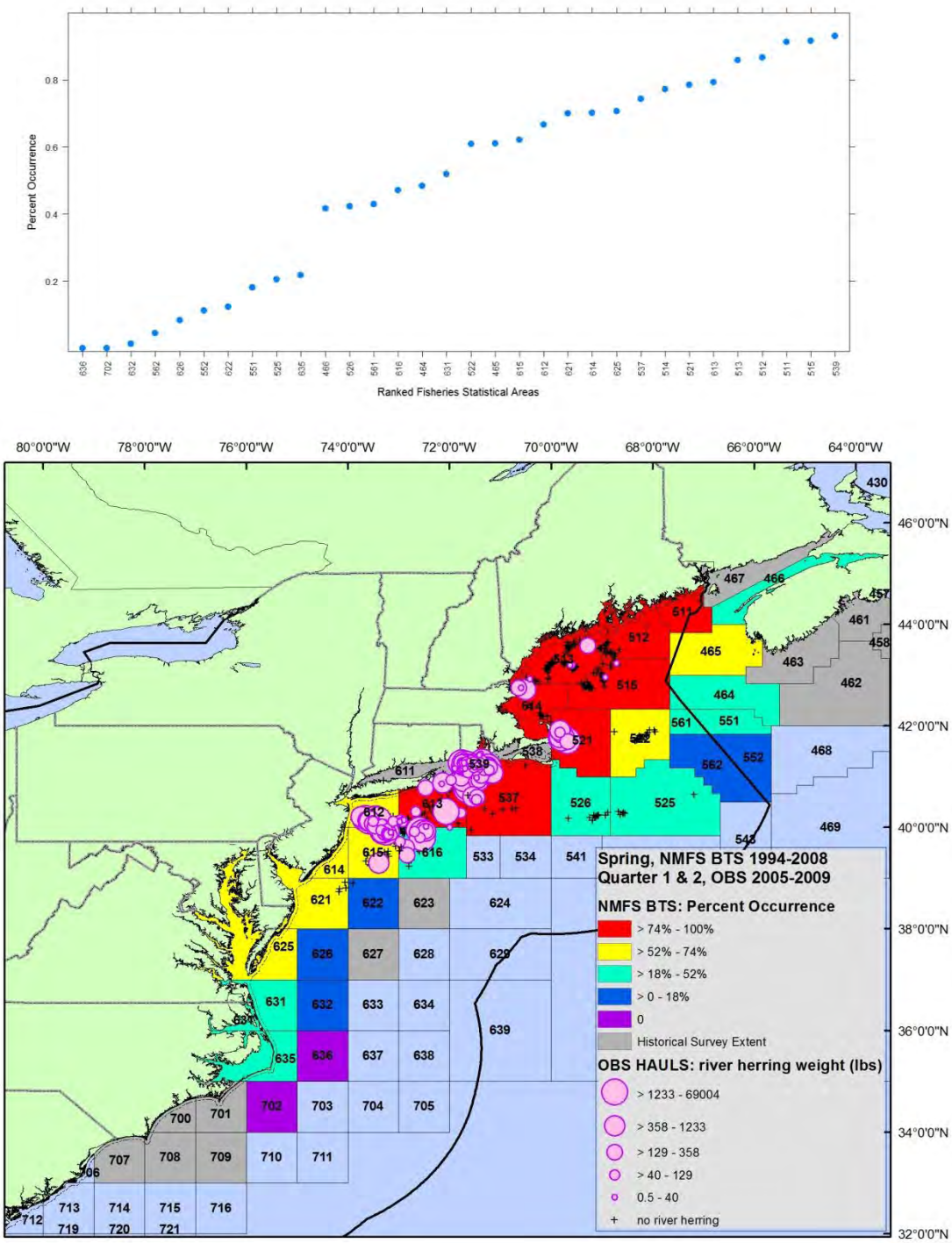


Figure 7: Percent occurrence of river herring in spring research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by statistical area grouped from >74-100% (red), >52-74% (yellow), >18-52% (aqua), >0-18% (dark blue) and 0% (purple) (bottom). Ranks are based on river herring percent occurrence values in the spring research surveys. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 and 2 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

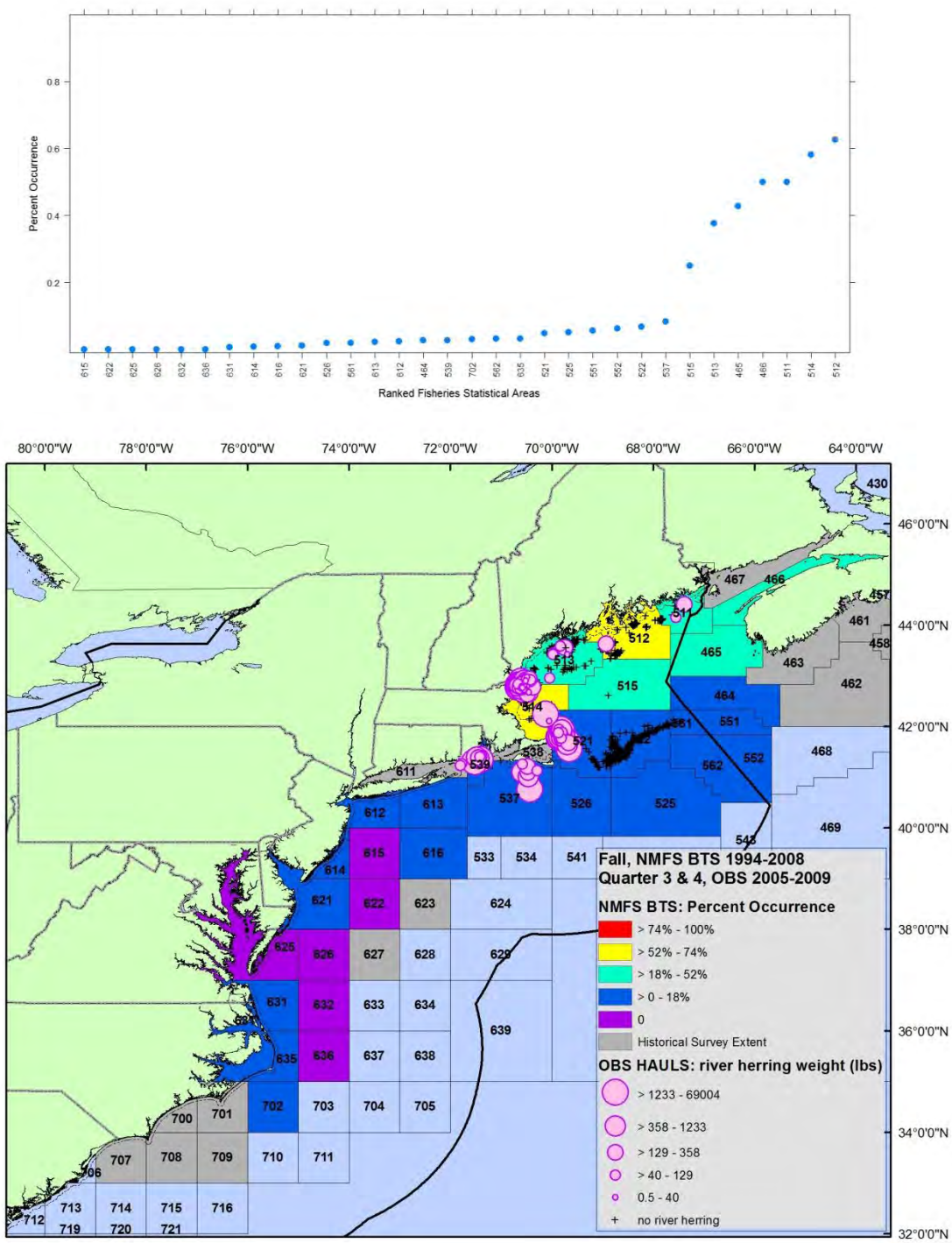


Figure 8: Percent occurrence of river herring in fall research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by statistical area grouped from >74-100% (red), >52-74% (yellow), >18-52% (aqua), >0-18% (dark blue) and 0% (purple) (bottom). Ranks are based on river herring percent occurrence values in the spring research surveys. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 3 and 4 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

References

Cieri, M., G. Nelson, and M. A. Armstrong. 2008. *Estimates of river herring bycatch in the directed Atlantic herring fishery*. Report prepared for the Atlantic States Marine Fisheries Commission, Washington, DC. September 23, 2008.

Shepherd, G. 1986. Evaluation of the river herring by-catch in the mackerel fishery. *Woods Hole Laboratory Reference Document* 86-10. US Department of Commerce.

Wigley, S. E. , J. Blaylock, P. J. Rago. 2009. River herring discard estimation, precision and sample size analysis. *Northeast Fish Science Center Reference Document* 09-20. US Department of Commerce.

DRAFT

Appendix

Tables

Q1	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	0	0
511	0	0	0	0
512	0	1	0	1
513	0	5	0	5
514	0	18	0	18
515	0	1	0	1
521	1	23	0	24
522	0	8	0	8
525	0	1	0	1
526	0	1	0	1
534	1	1	0	2
537	56	49	0	105
538	2	2	0	4
539	161	114	0	275
561	0	0	0	0
562	0	2	0	2
611	80	32	0	112
612	8	132	0	140
613	32	126	0	158
614	0	1	0	1
615	25	124	0	149
616	24	81	0	105
621	2	10	0	12
622	5	23	0	28
623	0	1	0	1
626	0	6	0	6

Table A.1: Number of directed herring trips separated by gear and statistical area for quarter 1. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Q2	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	0	0
511	0	8	2	10
512	0	10	76	86
513	1	278	121	400
514	0	36	1	37
515	0	35	8	43
521	0	40	2	42
522	0	21	0	21
525	0	2	0	2
526	1	11	0	12
534	0	1	0	1
537	4	50	0	54
538	0	0	0	0
539	9	5	0	14
561	0	0	0	0
562	0	0	0	0
611	1	1	0	2
612	1	0	0	1
613	1	6	0	7
614	0	0	0	0
615	0	4	0	4
616	2	6	0	8
621	0	0	0	0
622	0	1	0	1
623	0	0	0	0
626	0	0	0	0

Table A.2: Number of directed herring trips separated by gear and statistical area for quarter 2. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Q3	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	1	1
465	0	0	2	2
511	0	18	119	137
512	3	150	406	559
513	247	242	324	813
514	85	28	8	121
515	0	11	20	31
521	0	14	0	14
522	2	181	3	186
525	0	7	0	7
526	0	0	0	0
534	0	0	0	0
537	0	1	0	1
538	0	0	0	0
539	0	1	0	1
561	0	6	0	6
562	0	0	0	0
611	0	0	0	0
612	0	0	0	0
613	0	0	0	0
614	0	0	0	0
615	0	0	0	0
616	0	0	0	0
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A.3: Number of directed herring trips separated by gear and statistical area for quarter 3. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Q4	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	1	0	1
511	0	15	53	68
512	0	16	31	47
513	8	106	25	139
514	33	222	8	263
515	0	2	1	3
521	7	199	0	206
522	1	55	0	56
525	1	0	0	1
526	0	1	0	1
534	0	0	0	0
537	2	19	0	21
538	0	0	0	0
539	93	21	0	114
561	0	1	0	1
562	0	1	0	1
611	43	10	0	53
612	2	1	0	3
613	8	6	0	14
614	1	0	0	1
615	0	0	0	0
616	0	0	0	0
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A.4: Number of directed herring trips separated by gear and statistical area for quarter 4. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

NMFS BTS Winter 1994-2007					
AREA	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
614	13	0.846153846	1	0.805448788	1
613	128	0.84375	2	-0.083656329	15
539	10	0.8	3	-0.487278536	20
612	30	0.7	4	0.142164949	8
537	225	0.666666667	5	-0.022998617	10
615	102	0.5	6	-0.035149298	12
625	48	0.479166667	7	-0.469611988	19
621	99	0.454545455	8	-0.361947445	17
526	119	0.268907563	9	-0.031869313	11
616	125	0.208	10	0.060962733	9
631	82	0.134146341	11	-0.036515113	13
525	117	0.111111111	12	-0.210428394	16
635	27	0.111111111	12	-0.372659733	18
622	130	0.1	14	0.201160655	6
552	11	0.090909091	15	0.795905513	2
562	25	0.08	16	0.402988721	5
626	131	0.076335878	17	-0.061931623	14
636	32	0.03125	18	0.161388547	7
623	10	0	19	0.642275966	3
632	68	0	19	0.439684587	4

Table A.5: Ranked statistical areas (AREA) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in winter research surveys. The number of survey tows (TOWS) by statistical area is provided. Statistical areas with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2007.

NMFS BTS Spring 1994-2008					
AREA	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
539	43	0.930232558	1	0.048223074	12
515	166	0.915662651	2	0.185106619	6
511	69	0.913043478	3	0.41081519	4
512	83	0.86746988	4	0.030680333	14
513	113	0.85840708	5	-0.092156843	24
613	246	0.792682927	6	-0.136116442	27
521	191	0.785340314	7	-0.103550876	26
514	185	0.772972973	8	0.004382231	19
537	241	0.742738589	9	0.013147031	16
625	191	0.706806283	10	-0.326634116	30
614	151	0.701986755	11	0.009249683	17
621	273	0.6996337	12	0.004444391	18
612	219	0.666666667	13	0.02287269	15
615	119	0.621848739	14	0.111339016	9
465	100	0.61	15	-0.075776668	22
522	207	0.608695652	16	0.034462192	13
631	179	0.519553073	17	-0.202880679	28
464	89	0.483146067	18	-0.096883651	25
616	119	0.470588235	19	-0.048907631	20
561	49	0.428571429	20	0.269207792	5
526	156	0.423076923	21	-0.05188503	21
466	12	0.416666667	22	0.471084801	3
635	156	0.217948718	23	-0.548940546	32
525	230	0.204347826	24	0.066841291	11
551	111	0.18018018	25	0.127428325	8
622	122	0.12295082	26	0.655564103	1
552	71	0.112676056	27	-0.243404178	29
626	120	0.083333333	28	0.146788992	7
562	134	0.044776119	29	0.081239939	10
632	78	0.012820513	30	0.486129946	2
636	39	0	31	-0.337694765	31
702	53	0	31	-0.085072957	23

Table A.6: Ranked statistical areas (AREA) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in spring research surveys. The number of survey tows (TOWS) by statistical area is provided. Statistical areas with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2008.

NMFS BTS Fall 1994-2008					
AREA	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
512	91	0.626373626	1	0.955824637	2
514	160	0.58125	2	0.497206356	6
466	14	0.5	3	0.229886445	12
511	62	0.5	3	0.594104648	4
465	110	0.427272727	5	-0.275132304	20
513	122	0.37704918	6	-0.366110161	24
515	156	0.25	7	-0.120340473	19
537	228	0.083333333	8	0.347935696	8
522	208	0.067307692	9	0.43719754	7
552	81	0.061728395	10	-1.061954751	31
551	125	0.056	11	0.304046913	10
525	233	0.051502146	12	0.064427119	16
521	208	0.048076923	13	-0.341945975	21
635	158	0.03164557	14	-0.488781686	26
562	128	0.03125	15	0.147723364	13
702	66	0.03030303	16	0.793263683	3
539	36	0.027777778	17	-0.362844938	23
464	74	0.027027027	18	-1.129410073	32
612	209	0.023923445	19	-0.347490311	22
613	273	0.021978022	20	-0.031337982	17
561	52	0.019230769	21	-0.677302761	28
526	164	0.018292683	22	-0.458971258	25
621	269	0.011152416	23	-0.036204706	18
616	114	0.00877193	24	0.287512246	11
614	138	0.007246377	25	0.555480202	5
631	171	0.005847953	26	0.120887594	14
615	119	0	27	-0.618119832	27
622	114	0	27	-0.887163123	30
625	198	0	27	0.09910871	15
626	118	0	27	-0.83185715	29
632	70	0	27	1.267479015	1
636	33	0	27	0.314304904	9

Table A.7: Ranked statistical areas (AREA) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in fall research surveys. The number of survey tows (TOWS) by statistical area is provided. Statistical areas with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2008.

NMFS BTS Winter 1994-2008					
STRATUM	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
1050	50	0.84	1	6.93889E-17	15
1060	109	0.80733945	2	0.035478596	13
1010	89	0.741573034	3	-0.017905444	16
1090	61	0.524590164	4	-0.155907169	22
1070	37	0.513513514	5	0.410531734	8
1690	98	0.5	6	-0.086548458	19
1020	87	0.482758621	7	0.012051389	14
1730	60	0.466666667	8	-0.086979627	20
1080	11	0.454545455	9	-1.13437527	29
1110	40	0.4	10	0.257752174	10
1100	96	0.395833333	11	-0.235850851	25
1650	126	0.285714286	12	-0.027856228	17
1740	58	0.275862069	13	-0.660812928	27
1130	72	0.180555556	14	-0.214475284	23
1040	12	0.166666667	15	-0.750797253	28
1030	37	0.135135135	16	0.426406974	5
1610	68	0.088235294	17	-0.36073455	26
1160	29	0.034482759	18	0.389125787	9
1750	43	0.023255814	19	-0.09910786	21
1700	55	0.018181818	20	-0.23131104	24
1140	33	0	21	0.426406974	5
1190	10	0	21	0.620106139	4
1620	29	0	21	0.168490797	12
1630	24	0	21	-1.220873863	30
1640	10	0	21	1.146046614	1
1660	41	0	21	-0.053739318	18
1670	36	0	21	0.791649478	3
1710	39	0	21	0.23131104	11
1720	10	0	21	0.804026489	2
1760	13	0	21	0.418695621	7

Table A.8: Ranked survey strata (STRATUM) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in winter research surveys. The number of survey tows (TOWS) by survey strata is provided. Survey strata with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2007.

NMFS BTS Spring 1994-2008

STRATUM	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
3590	10	1	1	0.98392021	2
1240	89	0.95505618	2	0.223246262	33
1370	74	0.932432432	3	0.100069653	49
1380	59	0.93220339	4	-0.425750232	81
3050	27	0.925925926	5	-0.111339016	64
3600	23	0.913043478	6	0.605991274	10
3450	22	0.909090909	7	0.117136801	46
1400	32	0.90625	8	0.149316234	42
3020	29	0.896551724	9	0.556287714	12
1351	27	0.888888889	10	0.197099084	35
3660	16	0.875	11	0.828594137	5
1050	63	0.873015873	12	0.305303336	27
3360	29	0.862068966	13	-0.782222878	91
1060	106	0.858490566	14	-0.884740393	94
1390	42	0.857142857	15	0.201154176	34
3300	14	0.857142857	15	0.337011254	26
1280	105	0.847619048	17	0.090882184	50
3270	13	0.846153846	18	-0.636722591	89
3210	12	0.833333333	19	-1.024235236	96
3280	30	0.833333333	19	-0.421201932	80
1360	112	0.821428571	21	-0.09588692	61
3240	28	0.821428571	21	-0.277764259	74
3350	27	0.814814815	23	-1.140641133	97
3340	30	0.8	24	-1.402562283	106
3250	29	0.793103448	25	0.690971688	6
3140	24	0.791666667	26	0.551356512	13
3130	28	0.785714286	27	-0.849977935	93
3220	31	0.774193548	28	-1.441988721	107
1270	57	0.771929825	29	-0.099565033	62
1340	69	0.768115942	30	-0.43550702	82
1220	53	0.754716981	31	0.174848423	39
3060	12	0.75	32	-0.592992878	88
3180	12	0.75	32	-0.336583687	77
1090	67	0.746268657	34	-0.403730172	79
3160	31	0.741935484	35	0.975207456	3
1070	27	0.740740741	36	0.256053654	31
3170	27	0.740740741	36	-0.446773288	83
1010	99	0.737373737	38	-0.965170421	95
3330	15	0.733333333	39	-1.872819983	108
3260	29	0.724137931	40	1.267823155	1

DRAFT

3460	18	0.722222222	41	0.439552304	19
3200	28	0.714285714	42	0.117473003	45
3610	27	0.703703704	43	0.669111025	7
3150	10	0.7	44	0.251872066	32
3580	10	0.7	44	-0.822222227	92
3110	29	0.689655172	46	-1.358142081	105
3320	25	0.68	47	0.129317899	44
1020	96	0.677083333	48	-0.059313664	59
1250	37	0.675675676	49	0.178130245	37
1290	106	0.660377358	50	-0.271242146	72
1230	57	0.649122807	51	-0.110929914	63
3230	28	0.642857143	52	-1.150390295	98
3310	28	0.642857143	52	0.008703763	54
1260	53	0.641509434	54	-0.169355223	69
3040	30	0.633333333	55	-0.466113337	84
3290	27	0.62962963	56	-0.188232439	71
3400	31	0.612903226	57	-0.336711484	78
3370	30	0.6	58	0.378768747	24
3080	29	0.586206897	59	0.274516216	29
3120	12	0.583333333	60	-1.174267118	100
3190	31	0.580645161	61	-0.161000479	67
3100	28	0.571428571	62	0.285591522	28
3390	14	0.571428571	62	-0.49048516	86
1690	86	0.569767442	64	-0.177319148	70
1730	71	0.563380282	65	0.06968492	51
1100	111	0.54954955	66	0.175575848	38
3070	28	0.535714286	67	-0.044458845	58
3090	15	0.533333333	68	-0.330351013	76
3380	29	0.517241379	69	0.921262905	4
3550	49	0.489795918	70	-1.184282207	101
1030	27	0.481481481	71	0.386232718	23
1300	42	0.476190476	72	0.34623796	25
3410	25	0.44	73	-0.161902497	68
3420	14	0.428571429	74	0.132054335	43
1080	12	0.416666667	75	0.453304692	18
3030	12	0.416666667	75	0.581798938	11
1650	97	0.371134021	77	-0.275296784	73
1740	55	0.327272727	78	0.102399329	47
3440	29	0.310344828	79	0.405802856	22
1180	10	0.3	80	-0.663761088	90
1210	55	0.290909091	81	0.150809258	41
1040	15	0.266666667	82	0.261225105	30
1330	24	0.25	83	0.652803781	9

DRAFT

1140	43	0.23255814	84	0.510421643	15
3430	28	0.214285714	85	0.652876207	8
1110	29	0.206896552	86	-1.305749876	103
1130	132	0.204545455	87	-0.030573692	56
1170	40	0.2	88	0.051529331	52
1190	119	0.18487395	89	0.185623879	36
1150	11	0.181818182	90	-0.14902602	66
1200	72	0.180555556	91	-1.207827251	102
1610	43	0.162790698	92	-0.032260003	57
1700	53	0.132075472	93	0.415497455	21
1750	33	0.090909091	94	-1.316687896	104
1760	13	0.076923077	95	0.425856017	20
7510	19	0.052631579	96	-0.48635946	85
7520	20	0.05	97	-0.323161627	75
1670	30	0.033333333	98	0.167895865	40
1160	161	0.02484472	99	-0.116149263	65
8500	43	0.023255814	100	0.457571568	17
1660	45	0.022222222	101	0.462974908	16
1620	31	0	102	-1.159325505	99
1630	26	0	102	0.102028247	48
1640	13	0	102	0.525458197	14
1710	30	0	102	-0.009284042	55
1720	13	0	102	-0.583942112	87
8510	21	0	102	-0.081641868	60
8520	19	0	102	0.047231444	53

Table A.9: Ranked survey strata (STRATUM) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in spring research surveys. The number of survey tows (TOWS) by survey strata is provided. Survey strata with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2008.

DRAFT

NMFS BTS Fall 1994-2008

STRATUM	TOWS	Percent Occurrence	Ranked	Median Q Index	Ranked
3660	17	0.882352941	1	1.539239575	2
1390	43	0.813953488	2	-0.837880357	85
3590	10	0.8	3	-0.36418973	70
3600	17	0.705882353	4	-0.254212876	67
3610	22	0.545454545	5	-0.130311289	59
1351	27	0.518518519	6	-0.871442581	87
1340	73	0.479452055	7	-1.122502735	95
1400	23	0.47826087	8	-0.47769524	74
1330	31	0.419354839	9	0.628904218	23
1260	55	0.418181818	10	0.161718192	43
1380	70	0.414285714	11	-1.163226259	98
1270	61	0.360655738	12	0.679963176	20
1360	111	0.36036036	13	-0.180664628	64
1370	68	0.279411765	14	0.450533597	30
1280	99	0.181818182	15	-0.949118092	92
3060	13	0.153846154	16	0.982187822	8
1210	55	0.127272727	17	0.0260233	51
1230	68	0.117647059	18	0.732832448	16
3130	29	0.103448276	19	-0.183321897	65
1060	109	0.091743119	20	-0.766634312	83
7520	23	0.086956522	21	0.228319336	39
3030	12	0.083333333	22	0.208084426	42
3390	13	0.076923077	23	2.00481621	1
1290	105	0.076190476	24	-0.14798711	60
1130	133	0.07518797	25	0.057655565	46
1160	174	0.074712644	26	-0.398668486	73
3460	27	0.074074074	27	-1.148320885	97
3430	28	0.071428571	28	0.779002499	14
3040	30	0.066666667	29	0.410669459	33
3070	30	0.066666667	29	1.100658507	6
1100	111	0.063063063	31	0.72119365	17
1140	43	0.046511628	32	0.893391581	11
1090	69	0.043478261	33	0.252457727	38
3450	24	0.041666667	34	-1.749463555	102
7510	24	0.041666667	34	0.029346272	50
1220	54	0.037037037	36	0.433906575	31
1240	82	0.036585366	37	-0.663612748	80
3160	29	0.034482759	38	0.267491304	37

DRAFT

3290	29	0.034482759	38	0.429204943	32
3280	31	0.032258065	40	0.209718939	41
1200	82	0.024390244	41	-0.396090443	72
1300	41	0.024390244	41	0.281213419	36
8500	43	0.023255814	43	0.5263253	27
1050	56	0.017857143	44	0.95809196	9
1690	86	0.011627907	45	-0.072196593	54
1020	99	0.01010101	46	0.022067181	52
1650	103	0.009708738	47	0.631104762	22
1010	100	0	48	-0.930520742	90
1030	27	0	48	0.481330406	28
1040	12	0	48	0.685622787	19
1070	26	0	48	-0.160038135	62
1080	12	0	48	-0.073283889	55
1110	27	0	48	-0.865119542	86
1120	10	0	48	-0.665486325	81
1150	13	0	48	-1.997465415	103
1170	40	0	48	0.389130196	34
1180	16	0	48	0.674500102	21
1190	106	0	48	-0.902536708	88
1250	38	0	48	-0.148506179	61
1610	44	0	48	-0.176197876	63
1620	31	0	48	0.030680333	49
1630	25	0	48	0.225386874	40
1660	44	0	48	-1.016610625	93
1670	23	0	48	-0.597221192	77
1700	59	0	48	0.462273931	29
1710	26	0	48	0.915935105	10
1730	74	0	48	-1.100658507	94
1740	58	0	48	-0.523354539	76
1750	25	0	48	-0.203393041	66
1760	10	0	48	-0.096559642	58
3020	27	0	48	0.045925081	48
3050	27	0	48	0.718372769	18
3080	27	0	48	-1.281551566	99
3090	14	0	48	-0.936377457	91
3100	27	0	48	-0.677353304	82
3110	29	0	48	-0.382867268	71
3140	25	0	48	-0.036468129	53
3150	10	0	48	0.086702021	45
3170	24	0	48	0.529644281	26
3180	13	0	48	0.735856255	15
3190	28	0	48	1.009544967	7

DRAFT

3200	29	0	48	-1.662834768	101
3220	30	0	48	-1.144354957	96
3230	26	0	48	-0.774676276	84
3240	25	0	48	-0.522490436	75
3250	28	0	48	-0.282700278	68
3260	28	0	48	-0.07919625	56
3270	11	0	48	0.049986821	47
3300	12	0	48	0.605502043	24
3310	29	0	48	0.826293052	13
3320	27	0	48	1.219666404	3
3330	12	0	48	-2.039499792	104
3340	29	0	48	-1.373650623	100
3350	27	0	48	-0.909053665	89
3360	27	0	48	-0.597500894	78
3370	28	0	48	-0.33121538	69
3380	30	0	48	-0.091198392	57
3400	29	0	48	0.121728316	44
3410	29	0	48	0.382052875	35
3420	10	0	48	0.571782999	25
3440	29	0	48	1.178106063	4
3550	51	0	48	-0.656184088	79
8510	20	0	48	0.863339047	12
8520	21	0	48	1.148320885	5

Table A.10: Ranked survey strata (STRATUM) using percent occurrence and median Q index calculated from river herring presence/absence and number of individuals, respectively, in fall research surveys. The number of survey tows (TOWS) by survey strata is provided. Survey strata with less than 10 survey tows were excluded from the analysis. Source: NMFS bottom-trawl surveys 1994-2008.

DRAFT

Figures

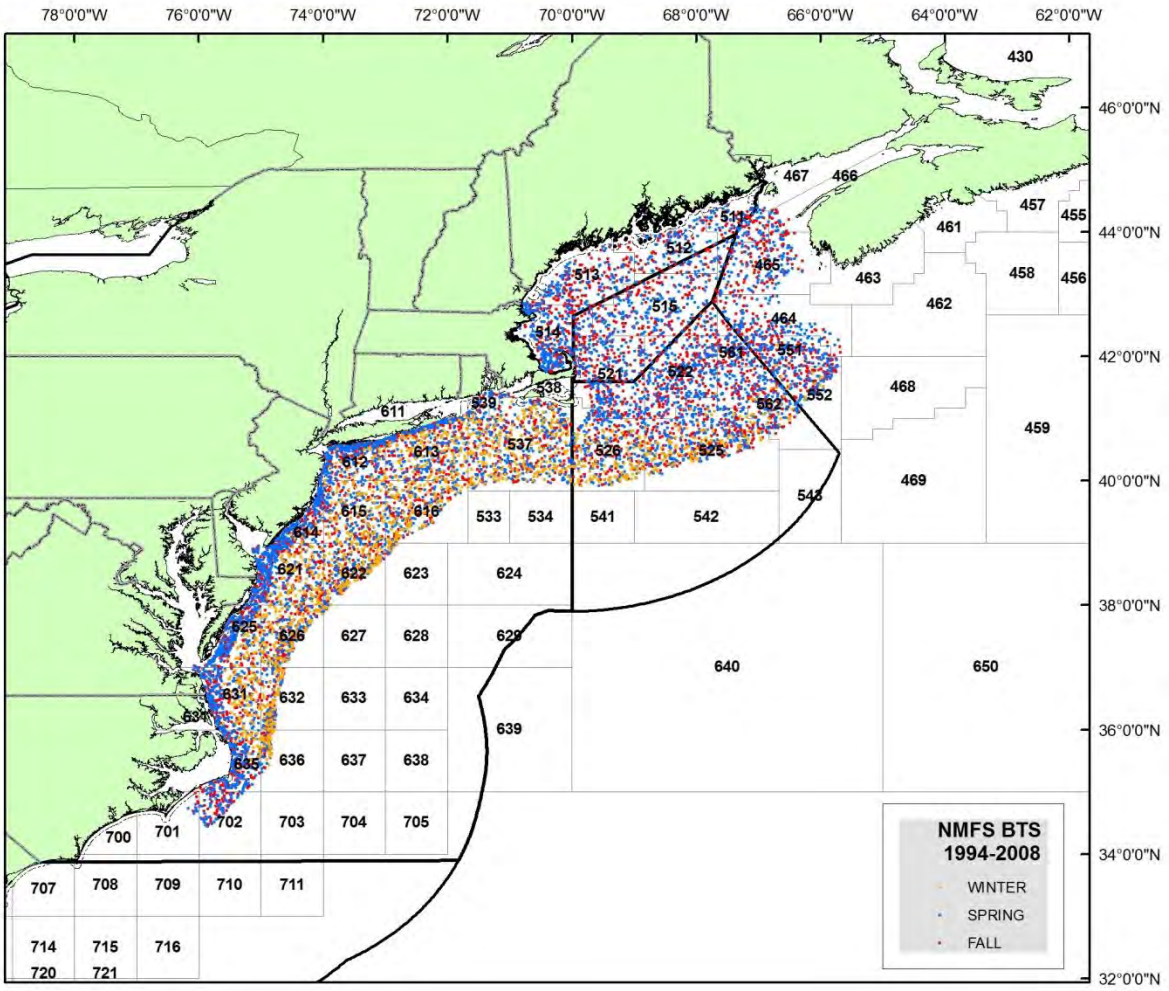


Figure A.1: Map of seasonal research surveys. Source: NMFS bottom-trawl surveys 1994-2008.

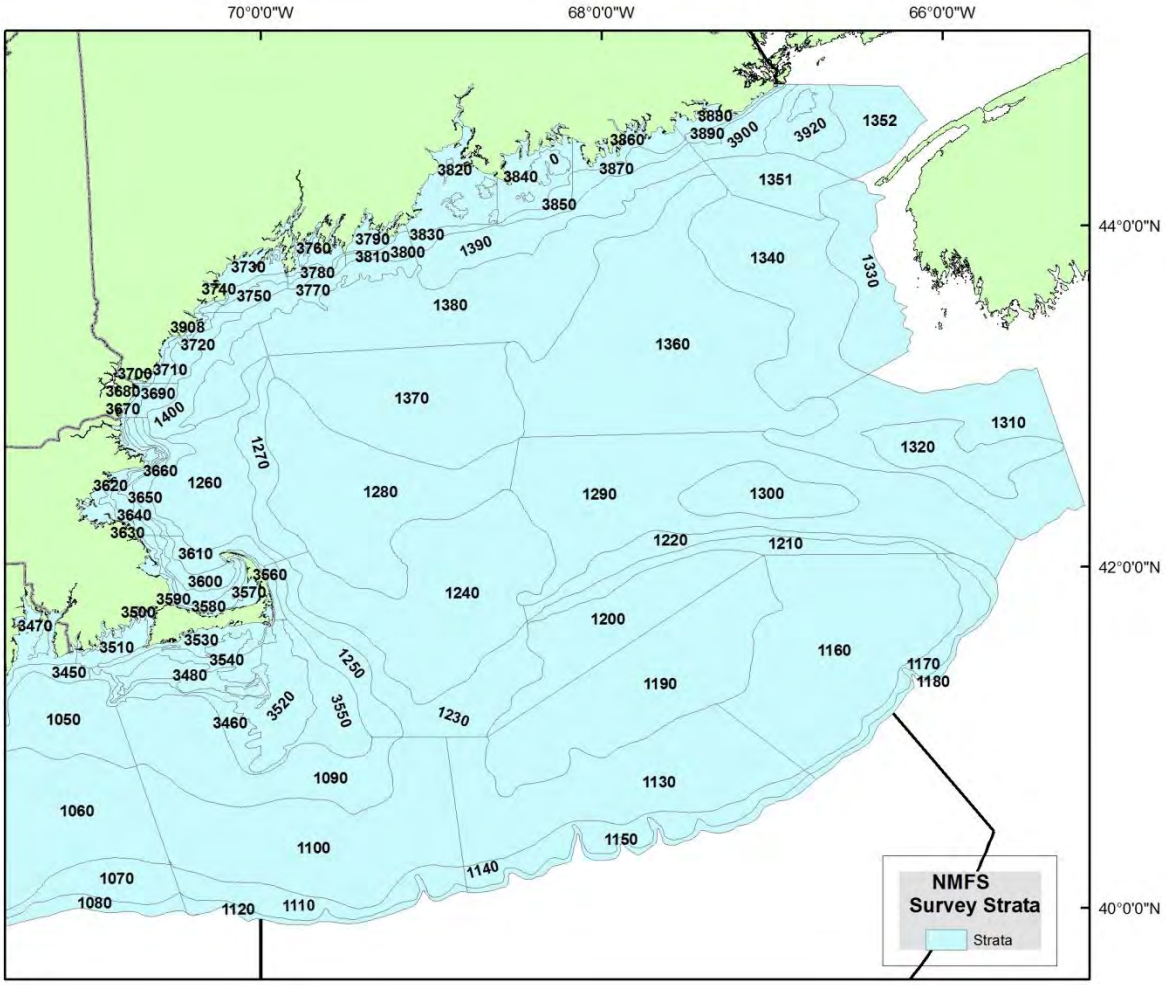


Figure A.2: Map of research survey strata in the Gulf of Maine and Georges Bank. Source: NMFS 2010.

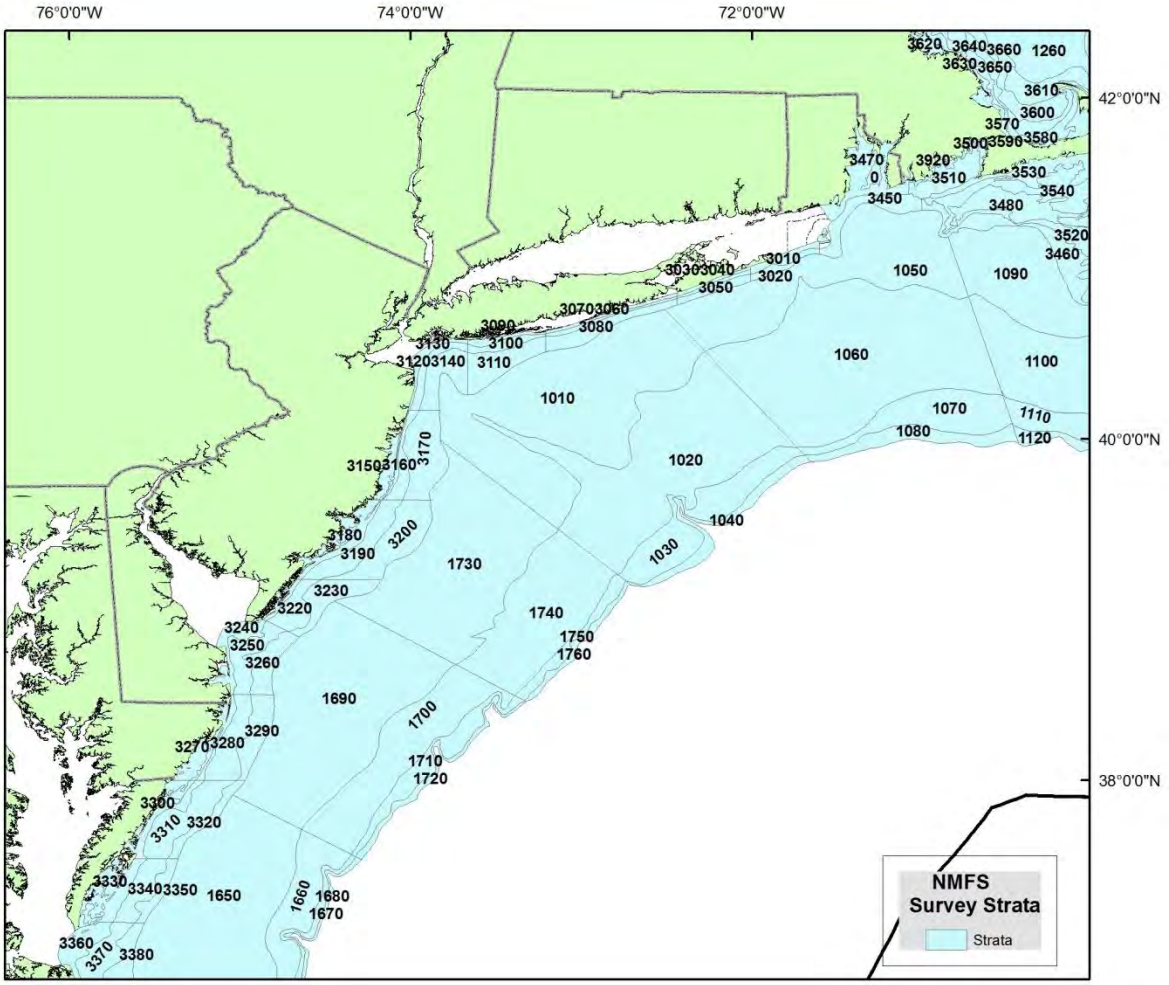


Figure A.3: Map of research survey strata in the northern Mid-Atlantic Bight. Source: NMFS 2010.

DRAFT

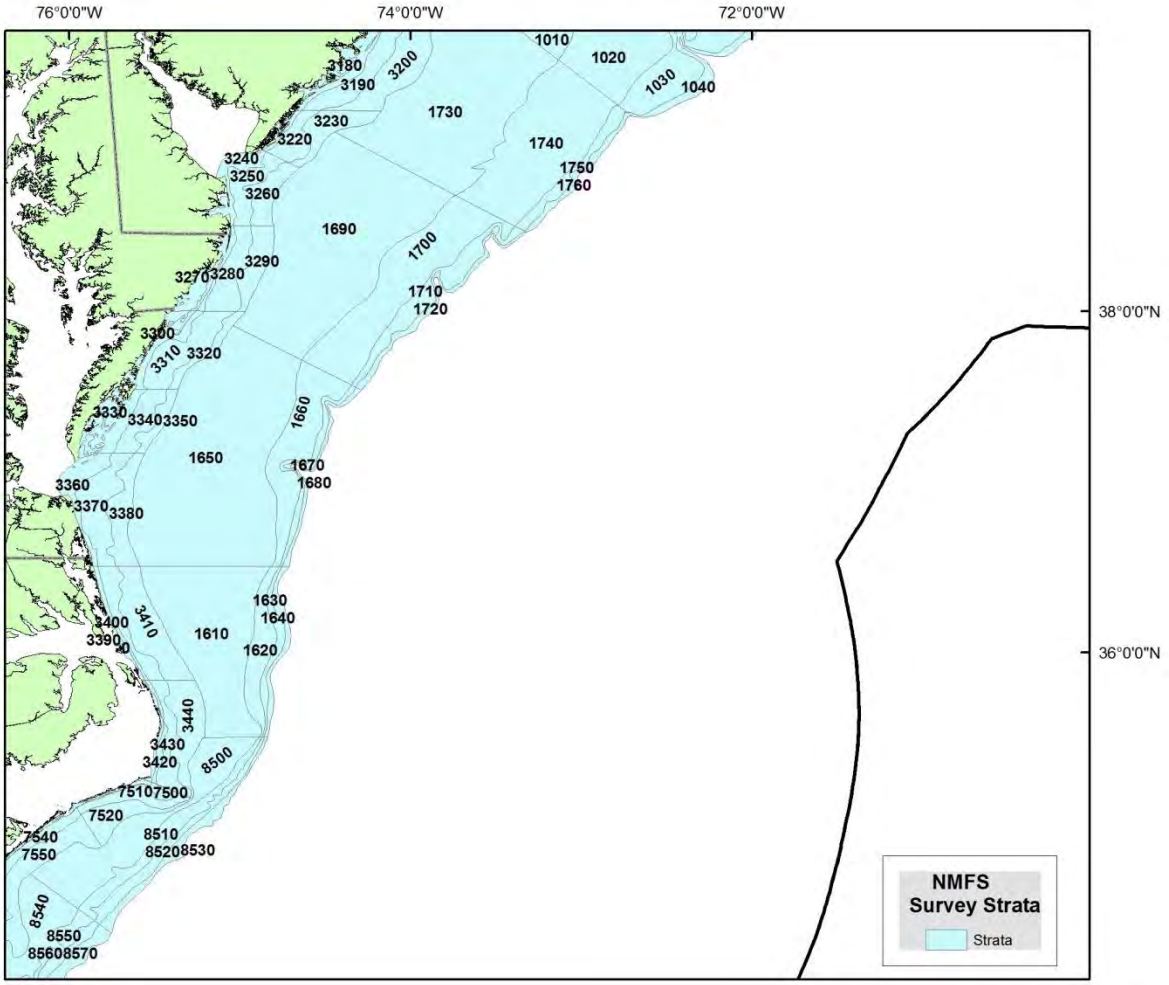


Figure A.4: Map of research survey strata in the central Mid-Atlantic Bight. Source: NMFS 2010.

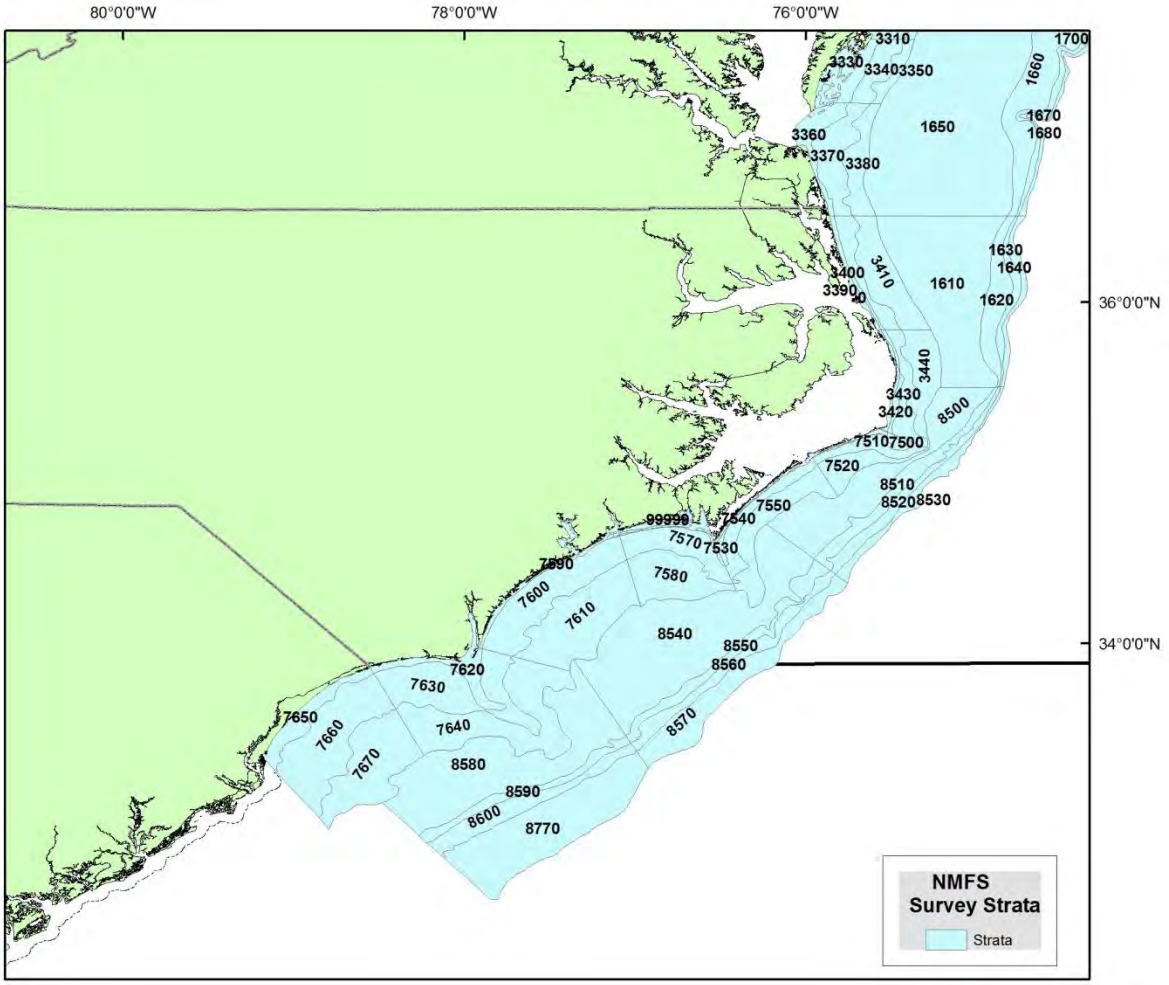


Figure A.5: Map of research survey strata in the southern Mid-Atlantic Bight. Source: NMFS 2010.

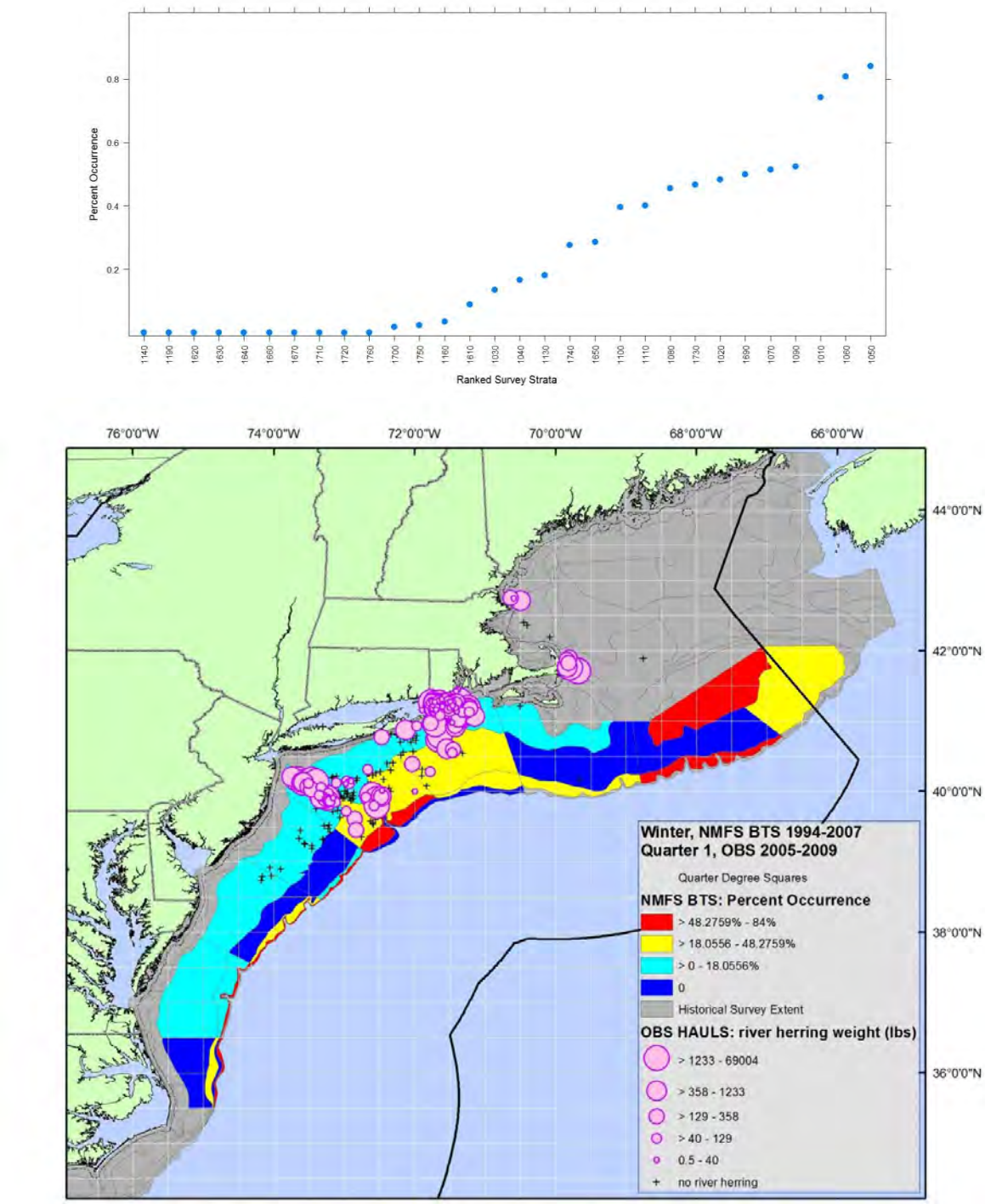


Figure A.6: Percent occurrence of river herring in winter research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2007 and NEFOP Database 2005-2009.

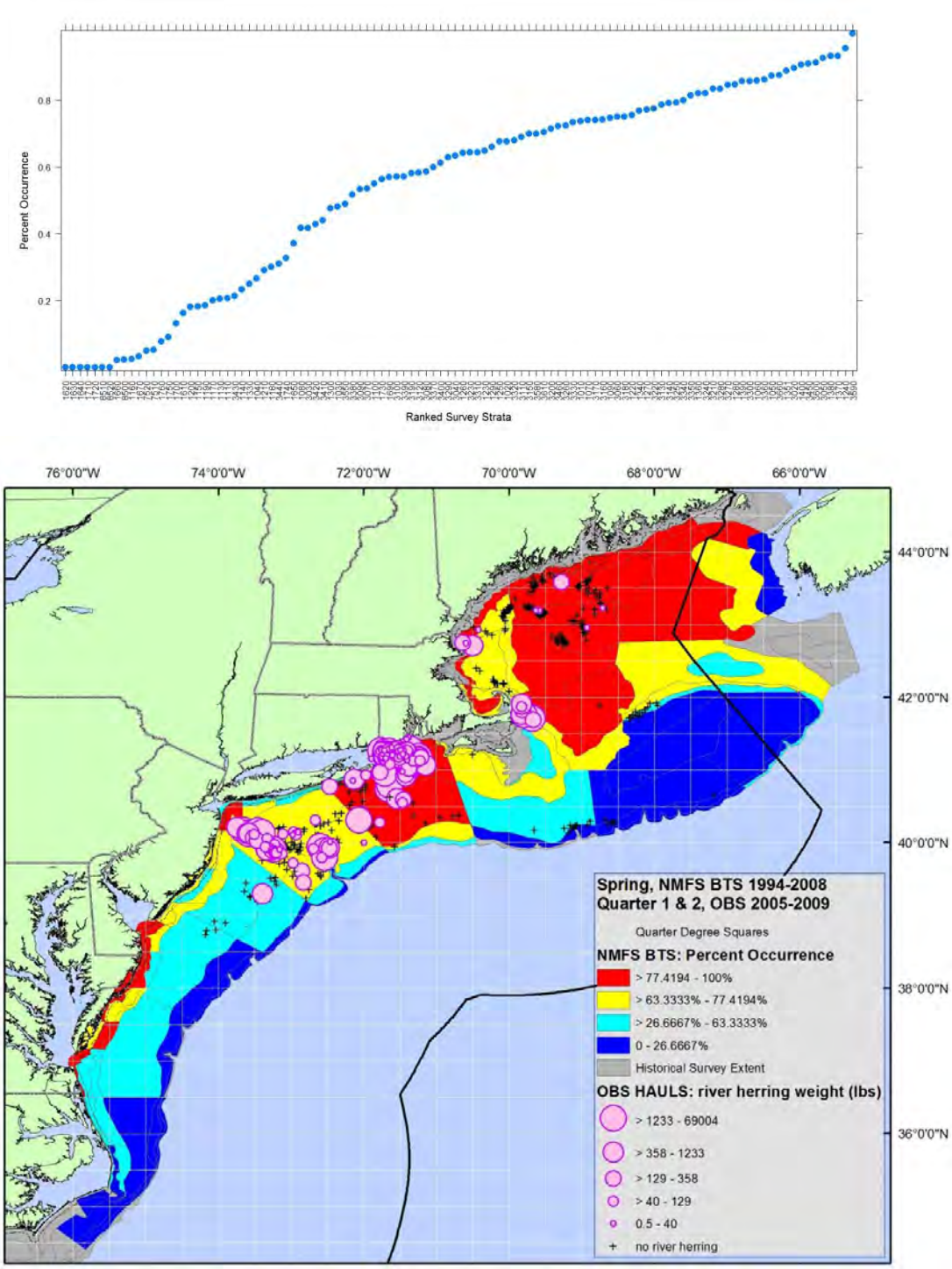


Figure A.7: Percent occurrence of river herring in spring research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 and 2 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

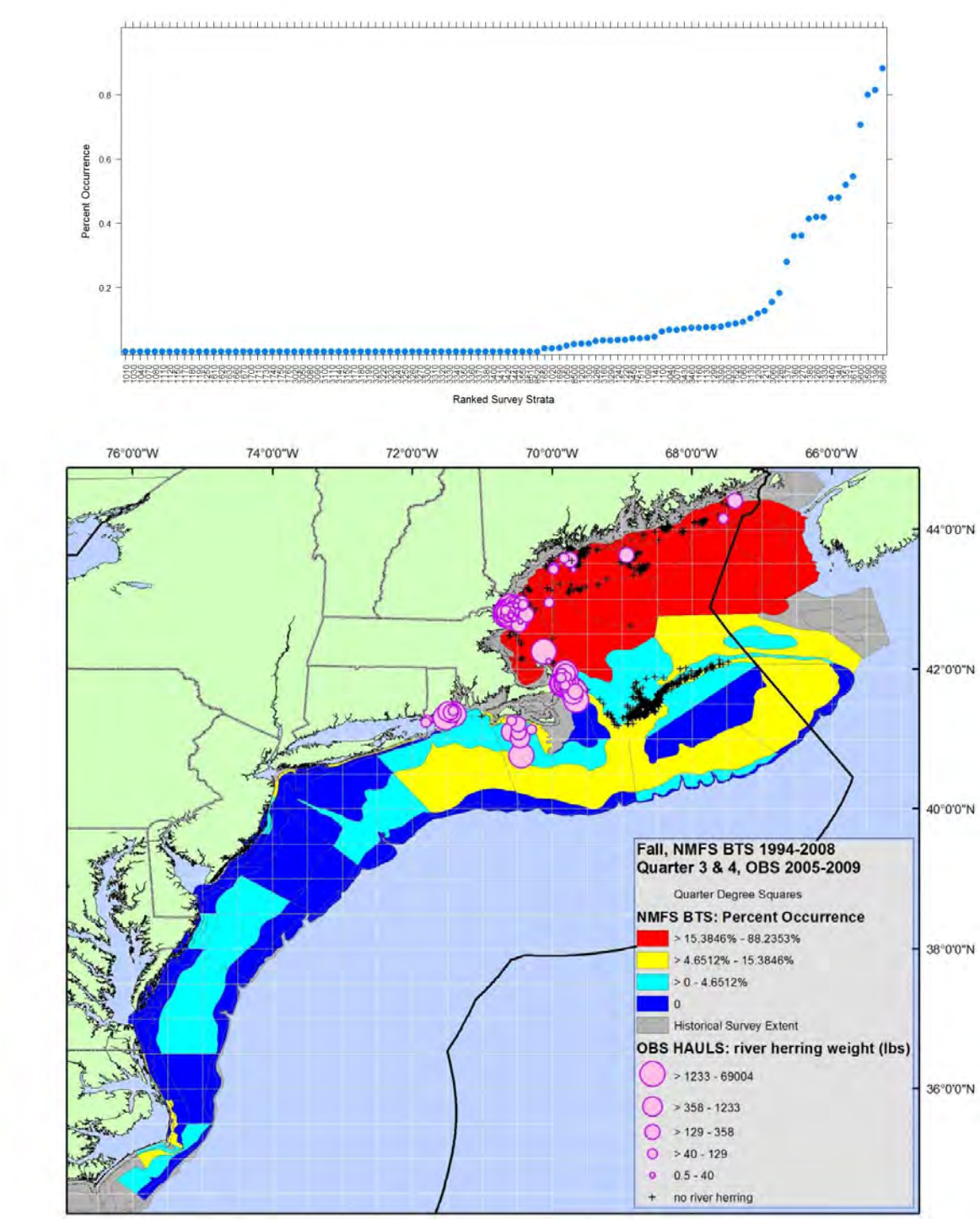


Figure A.8: Percent occurrence of river herring in fall research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 3 and 4 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

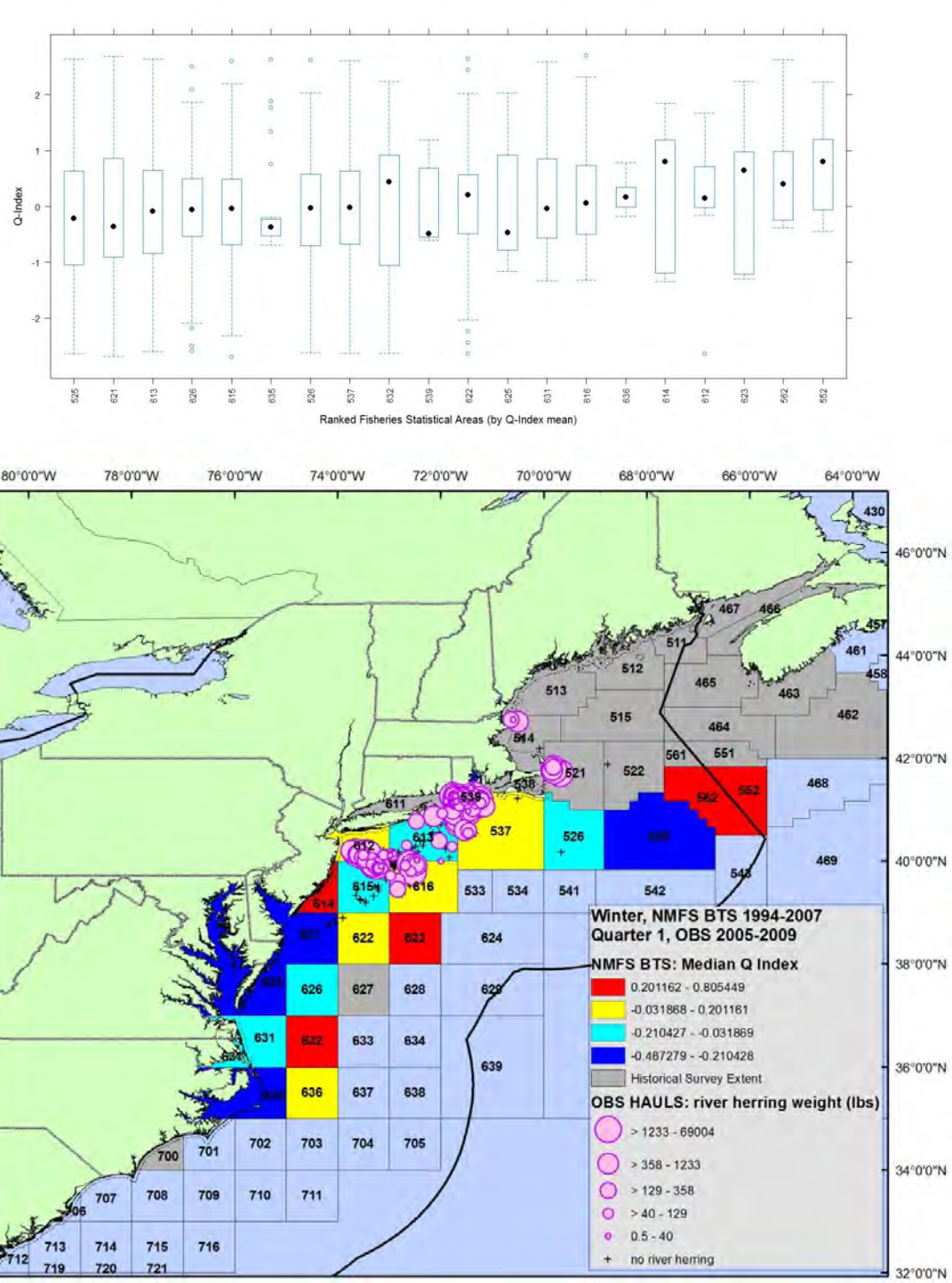


Figure A.9: Median Q index of river herring in winter research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring median Q index by statistical area grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2007 and NEFOP Database 2005-2009.

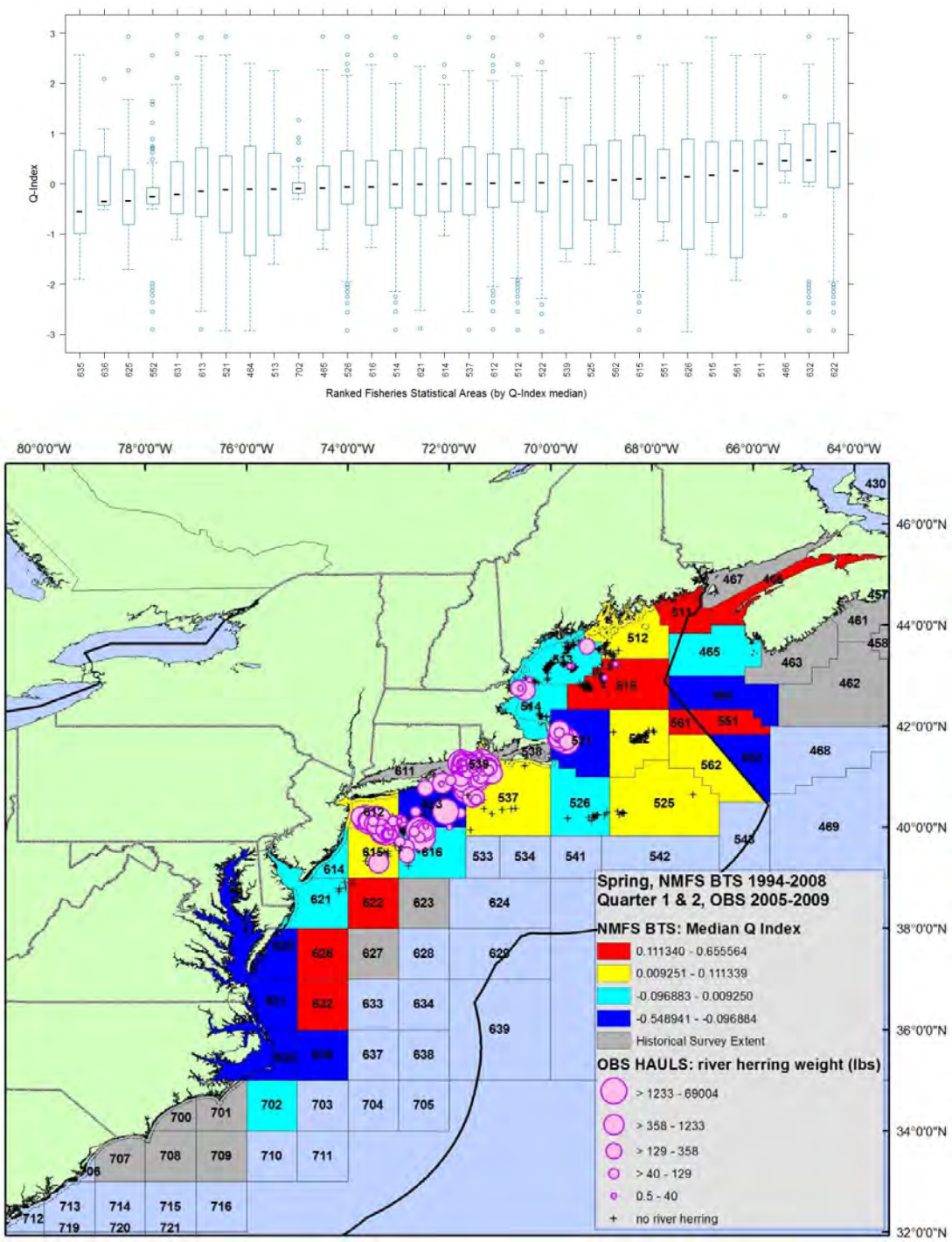


Figure A.10: Median Q index of river herring in spring research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring median Q index by statistical area grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 and 2 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

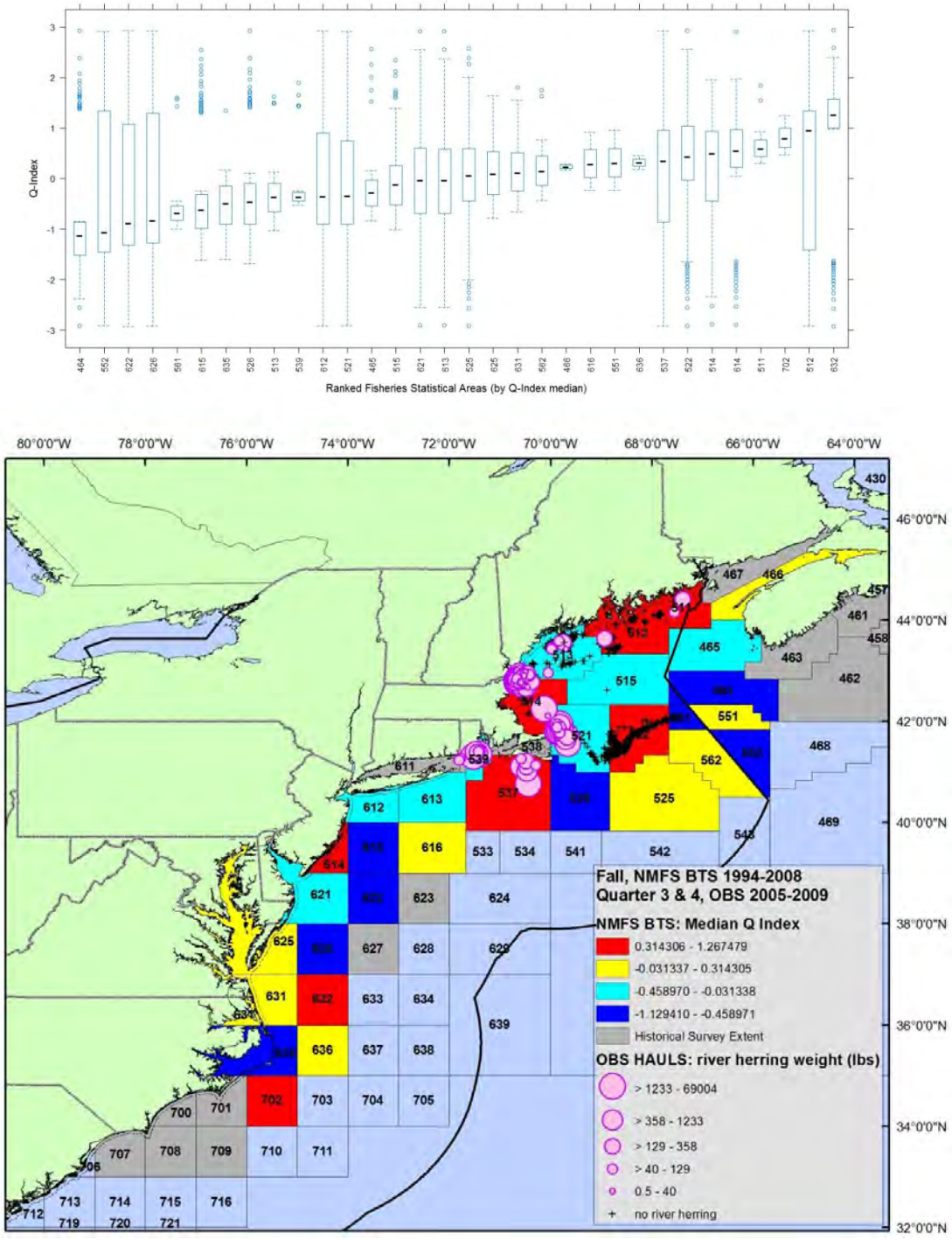


Figure A.11: Median Q index of river herring in fall research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring median Q index by statistical area grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 3 and 4 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

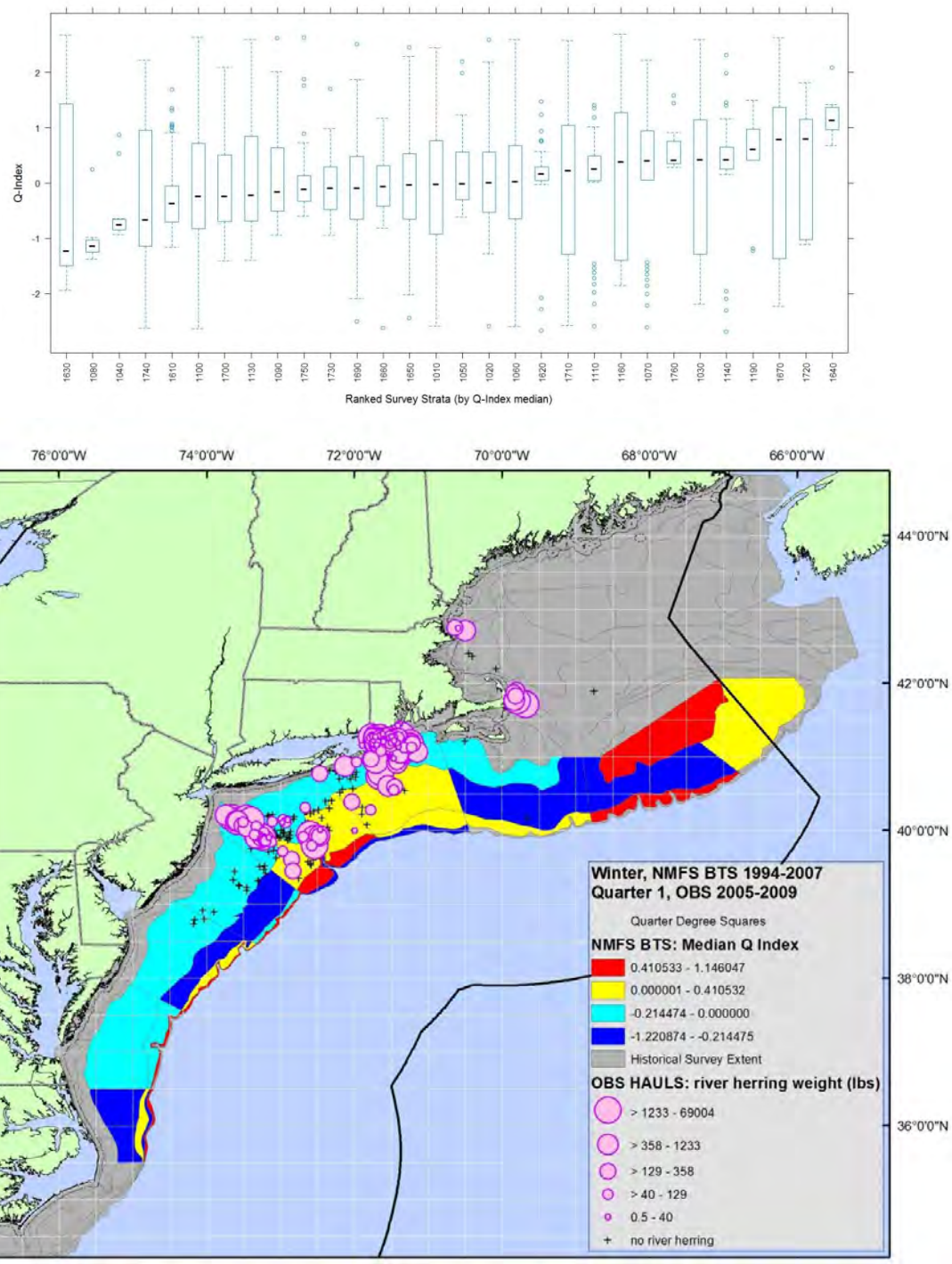


Figure A.12: Median Q index of river herring in winter research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring median Q index by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2007 and NEFOP Database 2005-2009.

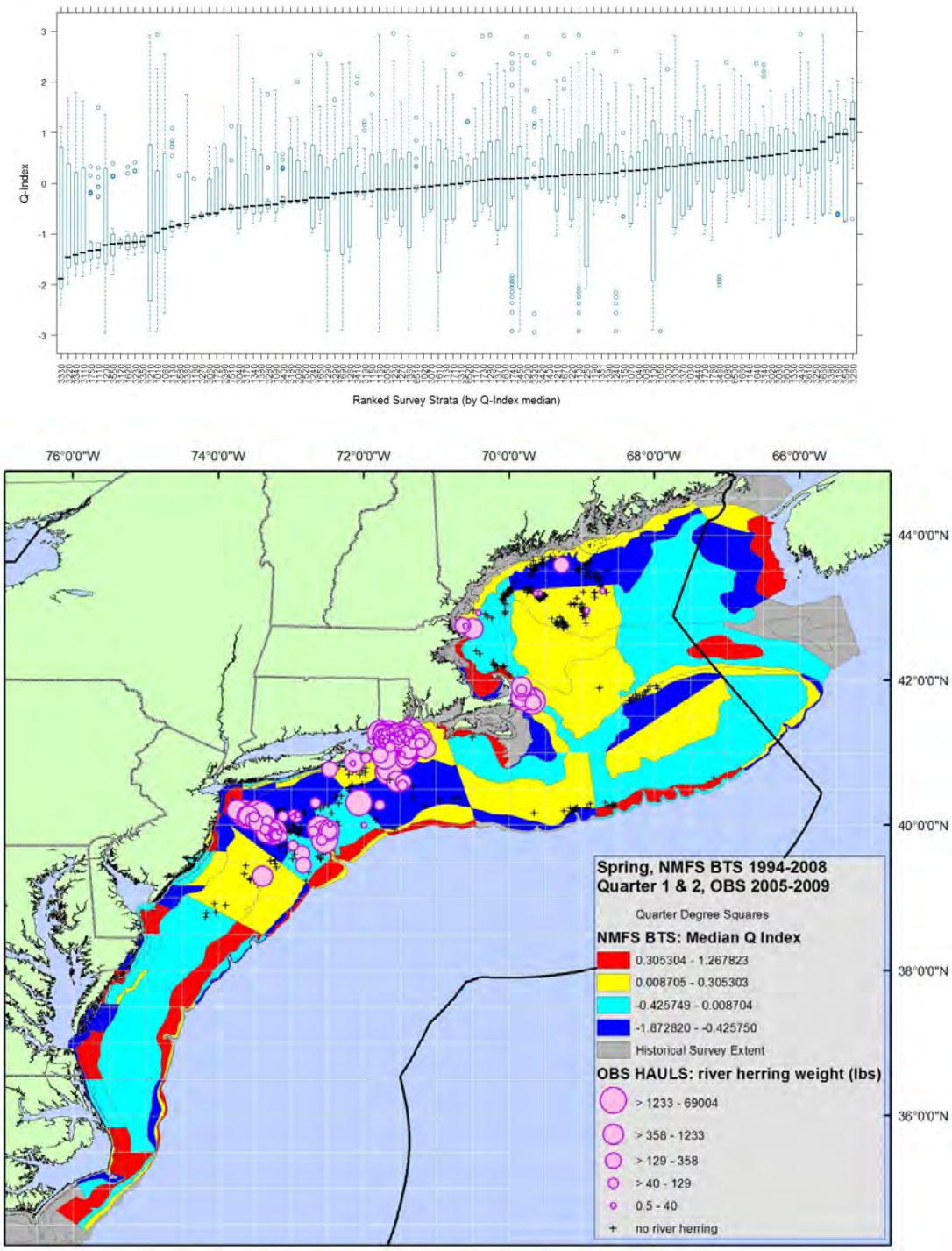


Figure A.13: Median Q index of river herring in spring research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring median Q index by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 1 and 2 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

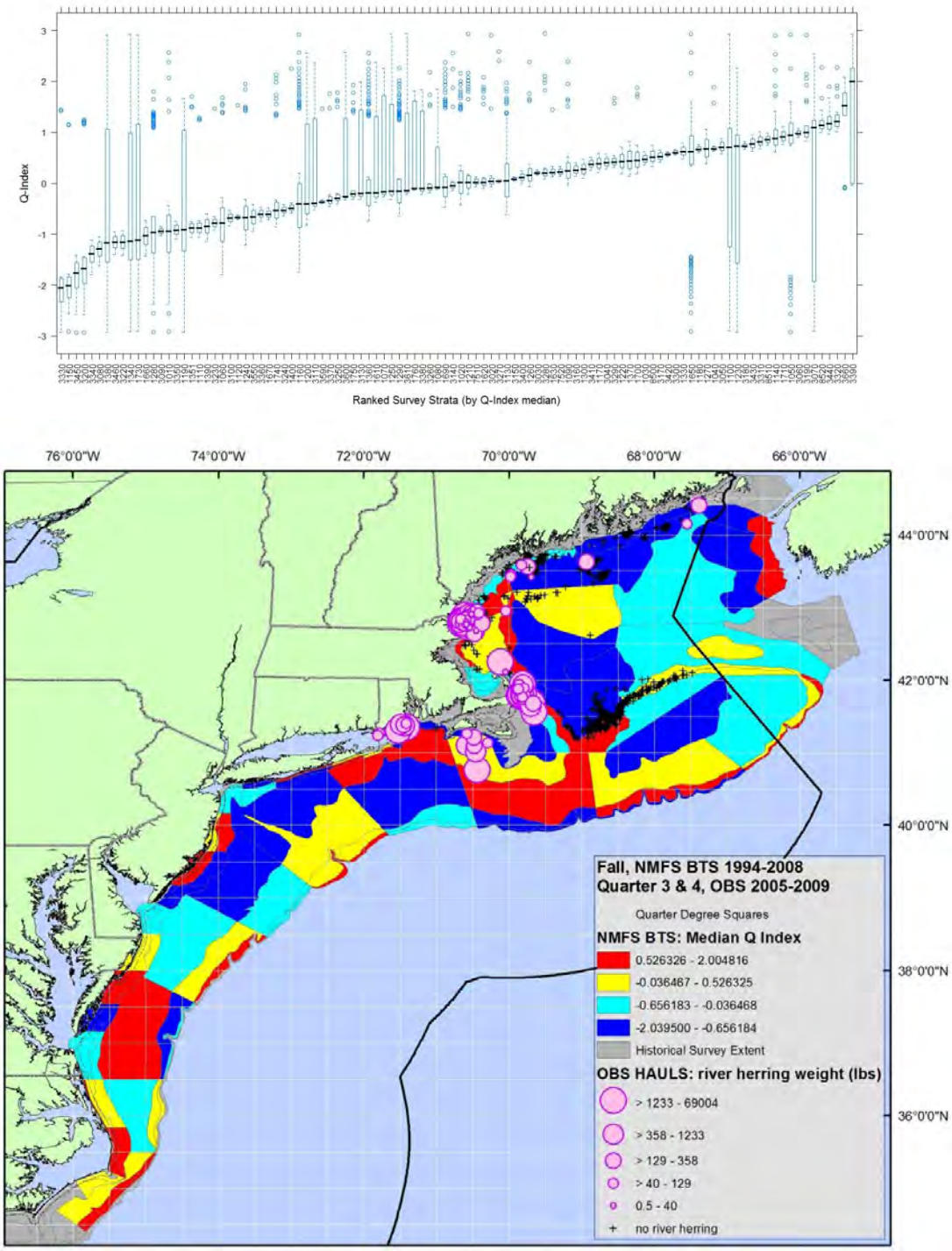


Figure A.14: Median Q index of river herring in fall research surveys by survey strata ranked from lowest to highest (top). Map of corresponding river herring median Q index by survey strata grouped by quantiles (bottom). Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets from quarter 3 and 4 directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: NMFS bottom-trawl surveys 1994-2008 and NEFOP Database 2005-2009.

DRAFT

UPDATE: Identification of river herring hotspots at sea using fisheries dependent and independent datasets

Prepared for the Atlantic Herring PDT

by

Jamie Cournane[1]

Steven Correia[2]

[1]University of New Hampshire and Environmental Defense Fund

[2]Massachusetts Division of Marine Fisheries

August 2010

Background

At its May 2010 meeting, the New England Fisheries Management Council Herring Oversight Committee (Committee) tasked the Plan Development Team (PDT) with identifying river herring hotspots as part of the analysis for Amendment 5 to the Atlantic Herring fishery management plan (FMP). Specifically, one of the objectives for Amendment 5 of the FMP is to address river herring bycatch in the Atlantic herring, *Clupea harengus*, fishery.

Here, the term "river herring" refers to alewife, *Alosa pseudoharengus*, and blueback herring, *Alosa aestivalis*. This analysis combines available data on both species to identify river herring hotspots. As recommended by the Committee at its July 2010 meeting, the following is an update to the methods and analysis developed by the PDT to identify river herring hotspots.

Study Area

The study area includes the Atlantic herring fishery management plan areas that overlap the Eastern US Continental shelf (Fig. 1).

Datasets and Data Selection

Multiple data sources are used in this analysis to identify river herring hotspots at sea. These sources include fishery dependent (Vessel Trip Reports, VTR and Northeast Fishery Observer Program, NEFOP) and fishery independent (National Marine Fisheries Service, NMFS bottom-trawl surveys) datasets (Tables 1-3). The most recent 5 years (2005-2009) of fishery dependent data and all years (1948-2008) of fishery independent are pooled separately by dataset in the analysis.

Data from directed herring trips were selected from VTR and NEFOP databases and grouped into bimonthly blocks (Tables 1 and 2). Here, directed herring trips were defined as 2,000 lbs of kept Atlantic herring on a trip. Data from other non-directed trips is not included in the analysis, but may become the scope of future examination. In addition, fishery dependent data included three broad gear categories: bottom otter-trawl, purse seine, and mid-water trawl (combining single and pair mid-water trawls).

River herring data from observed directed herring trips (NEFOP) were presence/absence and weight (lbs) from each haul or set. Data from the Massachusetts Division of Marine Fisheries and the Maine Department of Marine Resources portside surveys were excluded because spatial information was not available for all years and all trips.

Selected river herring data from NMFS bottom-trawl surveys included presence/absence and the number of individuals found at each sampling location. Surveys were separated by season: winter, spring, summer and fall (Tables 3 and 4).

Methods

Fishing Effort and River Herring Bycatch

To understand where and when the directed herring fishery operated throughout the fishing year, bimonthly maps and tables of the number of trips per statistical area were constructed using VTRs (Appendix Tables A1-A6 and Figs. A1-A6). Fishing effort was approximated by the number of trips within a statistical area. Bimonthly maps of fishing effort by statistical areas were color-coded from hot (red) to cool (blue) to identify fishing effort concentration areas.

These maps were overlaid with bimonthly NEFOP data on river herring bycatch events from observed hauls and sets. Circles of increasing size represent the magnitude of the bycatch event. These bycatch events were binned into circles of increasing size using all years and months combined and then mapped separately in bimonthly blocks.

Survey Hotspots

Seasonal NMFS bottom-trawl surveys were used to identify river herring "hotspot" areas. Analyses for the winter, spring, summer and fall surveys were conducted separately using a quarter degree squares spatial stratification scheme. Greater than 10 tows per square were required for inclusion in the analysis. Squares with less than 10 tows were omitted from the analysis.

For each seasonal survey, two metrics were used to determine hotspots:

- percent occurrence and
- percent occurrence and catch in number (number of individuals).

Percent occurrence. Within each square, percent occurrence was defined as the count of tows with river herring present divided by the total tows. For example if for a given area, the number of tows was 100, and out of those 100 tows 66 tows detected river herring. The percent occurrence for that area was 66%. The percent occurrence for each square was used for ranking. Maps of ranked squares were color-coded from hot (red) to cool (blue or purple) to identify river herring hotspot areas.

Percent occurrence and catch in number. An algorithm defined hot spots based on the intersection of the set of squares above a selected quantile for percent occurrence and set of squares above a selected quantile of a summary statistic for river herring catch (number of individuals). Tows with no river herring catch were omitted from the analysis. For example, candidate hotspots can be defined using the 75th quantile of percent occurrence and 75th quantile of median catch in number. Candidate “hot spot” squares were identified as squares meeting the following criteria:

- percent occurrence and mean catch in number ≥ the 75th quantiles of both variables

- percent occurrence and median catch in number ≥ the 75th quantiles of both variables
- percent occurrence and catch in number ≥ the 75th quantiles of both variables.

Candidate squares were ranked using each metric and recorded in respective tables, plots and maps (Appendix Tables A7-A18, Figs. A7- A38). These candidate hotspots were overlaid with bimonthly directed fishing trips per statistical area (VTRs) and river herring bycatch from observed hauls and sets (NEFOP) based on the timing of the NMFS bottom-trawl surveys (Figs. 2-5, Table 4).

Results

Fishing Effort and River Herring Bycatch

Visual differences in the spatial and temporal distribution of directed herring trips were evident from maps of fishing effort (Appendix Figs. A1-A6). In general during the first six months of the year, fishing effort shifted from the northern Mid-Atlantic Bight and southern New England waters (January-February) to primarily southern New England waters (March-April), and then to the Gulf of Maine (May-June). Then, fishing effort concentrated in the Gulf of Maine and Georges Bank (July-August and September-October), contracting to the Gulf of Maine and southern New England waters (November-December) at the end of the year.

Using NEFOP haul and set data, river herring bycatch events were inspected bimonthly (Appendix Figs. A1-A6). River herring bycatch events included areas in Ipswich Bay, off the back of Cape Cod, and in the northern Mid-Atlantic Bight (January-February and March-April). River herring bycatch events occurred in the northern Gulf of Maine and off the back of Cape Cod (May- June). Bycatch events also included areas in the northern Gulf of Maine (July-August and September-October), Ipswich Bay (September-October and November-December), and Massachusetts Bay, the back of Cape Cod, south of Martha's Vineyard, and near Block Island (November-December).

Survey Hotspots

Results include river herring hotspot areas ranked in tables, plots, and maps:

- percent occurrence (Appendix Figs. A31-A34)
- percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (Appendix Tables A7, A10, A13, A16, and Figs. A7, A10, A13, A16, A19, A22, A25, A28, A35-A38)
- percent occurrence and median catch in number ≥ the 75th quantiles of both variables (Appendix Tables A8, A11, A14, A17, and Figs. A8, A11, A14, A17, A20, A23, A26, A29, A35-A38)
- percent occurrence and catch in number ≥ the 75th quantiles of both variables (Appendix Tables A9, A12, A15, A18, and Figs. A9, A12, A15, A18, A21, A24, A27, A30, A35-A38)

Each of these above combinations produced different hotspot maps, but there was substantial overlap among maps of candidate river herring hotspot areas (Appendix Figs. A35-A38 and Table 5). The number of identified candidate river herring hotspot areas also varied by identification method and season (Table 5).

Fishing Effort, River Herring Bycatch, and Survey Hotspots

Fishery Observer data, Vessel Trip Reports and seasonal candidate hotspots provide can be integrated at the bimonthly-quarter degree square resolution. Fishery observer data can provide information on the distribution of observed river herring bycatch on a bimonthly-block basis for areas where the fishery is prosecuted. VTR data can provide spatial distribution of fishing effort. Note that the historic distribution of effort reflects locations where Atlantic herring and Atlantic mackerel can be caught. These target species may be available in other areas not currently fished because of regulations or economic considerations. Candidate hotspots are defined as bimonthly blocks combinations with high (≥75th quantile) of both percent occurrence and counts. The candidate spots provide information on the relative likelihood of encountering river herring for areas that have either little to no fishing effort or observer coverage. The candidate hotspots can be useful for evaluating the likely impact of changing the spatial-temporal distribution of fishing effort on reducing river herring bycatch.

We provide an example of the integrative approach by overlaying candidate hotspots identified using blocks at or above the 75th quantiles of the median catch in number and percent occurrence with fishing effort and observed river herring bycatch (Figures 2-5). We note that resolution finer than bimonthly and quarter degree square is not feasible.

Additional Information

State by state migration patterns of alewife, blueback herring, and American shad, *Alosa sapidissima*, in state fresh waters are included for reference (Table A19).

Tables

Jan-Dec	Gear Category			
Year	OT	PR	PS	ALL
2005	77	774	200	1051
2006	150	739	175	1064
2007	414	389	365	1168
2008	109	304	246	659
2009	203	406	225	834
ALL	953	2612	1211	**4776**

Jan-Feb	Gear Category			
Year	OT	PR	PS	ALL
2005	10	89	0	99
2006	52	108	0	160
2007	140	141	0	281
2008	56	101	0	157
2009	79	128	0	207
ALL	337	567	0	**904**

Mar-Apr	Gear Category			
Year	OT	PR	PS	ALL
2005	5	48	0	53
2006	19	71	0	90
2007	15	65	0	80
2008	7	44	0	51
2009	26	55	0	81
ALL	72	283	0	**355**

May-Jun	Gear Category			
Year	OT	PR	PS	ALL
2005	7	151	25	183
2006	0	158	27	185
2007	0	75	52	127
2008	0	25	53	78
2009	1	18	53	72
ALL	8	427	210	**645**

Jun-Aug	Gear Category			
Year	OT	PR	PS	ALL
2005	7	182	88	277
2006	12	202	94	308
2007	163	0	187	350
2008	17	12	177	206
2009	27	9	121	157
ALL	226	405	667	**1298**

Sep-Oct	Gear Category			
Year	OT	PR	PS	ALL
2005	20	195	82	297
2006	25	143	54	222
2007	64	52	126	242
2008	10	68	16	94
2009	25	128	45	198
ALL	144	586	323	**1053**

Nov-Dec	Gear Category			
Year	OT	PR	PS	ALL
2005	28	109	5	142
2006	42	57	0	99
2007	32	56	0	88
2008	19	54	0	73
2009	45	68	6	119
ALL	166	344	11	**521**

Table 1: Number of directed herring trips separated by gear, year and bimonthly groupings. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Jan-Dec	Gear Category			
Year	OT	PR	PS	ALL
2005	15	465	95	575
2006	64	120	0	184
2007	59	75	27	161
2008	8	209	69	286
2009	35	437	97	569
ALL	181	1306	288	**1775**

Jan-Feb	Gear Category			
Year	OT	PR	PS	ALL
2005	0	39	0	39
2006	36	72	0	108
2007	37	19	0	56
2008	4	44	0	48
2009	23	76	0	99
ALL	100	250	0	**350**

Mar-Apr	Gear Category			
Year	OT	PR	PS	ALL
2005	0	21	0	21
2006	0	3	0	3
2007	0	22	0	22
2008	0	41	0	41
2009	4	34	0	38
ALL	4	121	0	**125**

May-Jun	Gear Category			
Year	OT	PR	PS	ALL
2005	0	64	5	69
2006	0	6	0	6
2007	0	3	0	3
2008	0	28	25	53
2009	0	37	39	76
ALL	0	138	69	**207**

Jul-Aug	Gear Category			
Year	OT	PR	PS	ALL
2005	3	112	47	162
2006	16	17	0	33
2007	11	0	18	29
2008	4	15	36	55
2009	0	11	51	62
ALL	34	155	152	**341**

Sep-Oct	Gear Category			
Year	OT	PR	PS	ALL
2005	12	111	43	166
2006	8	20	0	28
2007	3	15	9	27
2008	0	42	8	50
2009	4	194	3	201
ALL	27	382	63	**472**

Nov-Dec	Gear Category			
Year	OT	PR	PS	ALL
2005	0	118	0	118
2006	4	2	0	6
2007	8	16	0	24
2008	0	39	0	39
2009	4	85	4	93
ALL	16	260	4	**280**

Table 2: Observed hauls from directed herring trips separated by gear, year and bimonthly groupings. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Source: NEFOP Database 2005-2009.

	Season				
Year	Winter	Spring	Summer	Fall	ALL
1948			52		52
1949			167		167
↓					
1963			154	88	242
1964	105		148	126	379
1965	99		151	142	392
1966	105			147	252
1967				195	195
1968		199		192	391
1969		203	204	175	582
1970		215		180	395
1971		203		216	419
1972	52	199		449	700
1973		481		436	917
1974		385		366	751
1975		267		391	658
1976		373		339	712
1977		353	262	407	1022
1978	77	385	264	529	1255
1979		469	245	556	1270
1980		435	264	388	1087
1981	81	366	160	356	963
1982		330		282	612
1983		327		343	670
1984		339		302	641
1985		317		289	606
1986		321		287	608
1987		285		290	575
1988		289		285	574
1989		252		277	529
1990		289		292	581
1991		291	6	305	602
1992	112	281		284	677
1993	105	285	56	299	745
1994	75	299	22	288	684
1995	117	288	26	297	728
1996	110	287		263	660
1997	108	290		287	685
1998	116	321		294	731
1999	118	291		295	704
2000	106	290		294	690
2001	140	279		283	702
2002	134	272		288	694
2003	65	270		280	615
2004	114	284		277	675
2005	80	260		278	618
2006	101	292		305	698
2007	114	312		294	720
2008		297		305	602
ALL	2234	12471	2181	13541	**30427**

Table 3: Number of tows from seasonal research surveys separated by year and season. Source: NMFS bottom-trawl surveys 1948-2008.

		NMFS BTS Seasons			
Month	Fishing Quarter	Winter	Spring	Summer	Fall
January	1	210			
February	1	1878	32		
March	1	85	6013		
April	2	61	5567		
May	2		821		
June	2		38	39	
July	3			764	
August	3			1350	
September	3			28	4545
October	4				6688
November	4				2152
December	4				156

Table 4: Number of tows from seasonal research surveys separated month, fishing quarter, and survey season. Note that spring and fall surveys overlap multiple fishing quarters. Source: NMFS bottom-trawl surveys 1948-2008.

	Number of Candidate Areas		
Season	mean	median	75th
Winter	12	16	14
Spring	25	37	27
Summer	13	18	18
Fall	20	29	29

Table 5: Resulting number of candidate river herring hotspot areas by season. Candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (mean), percent occurrence and median catch in number ≥ the 75th quantiles of both variables (median), and percent occurrence and catch in number ≥ the 75th quantiles of both variables (75th). Source: NMFS bottom-trawl surveys 1948-2008.

Figures

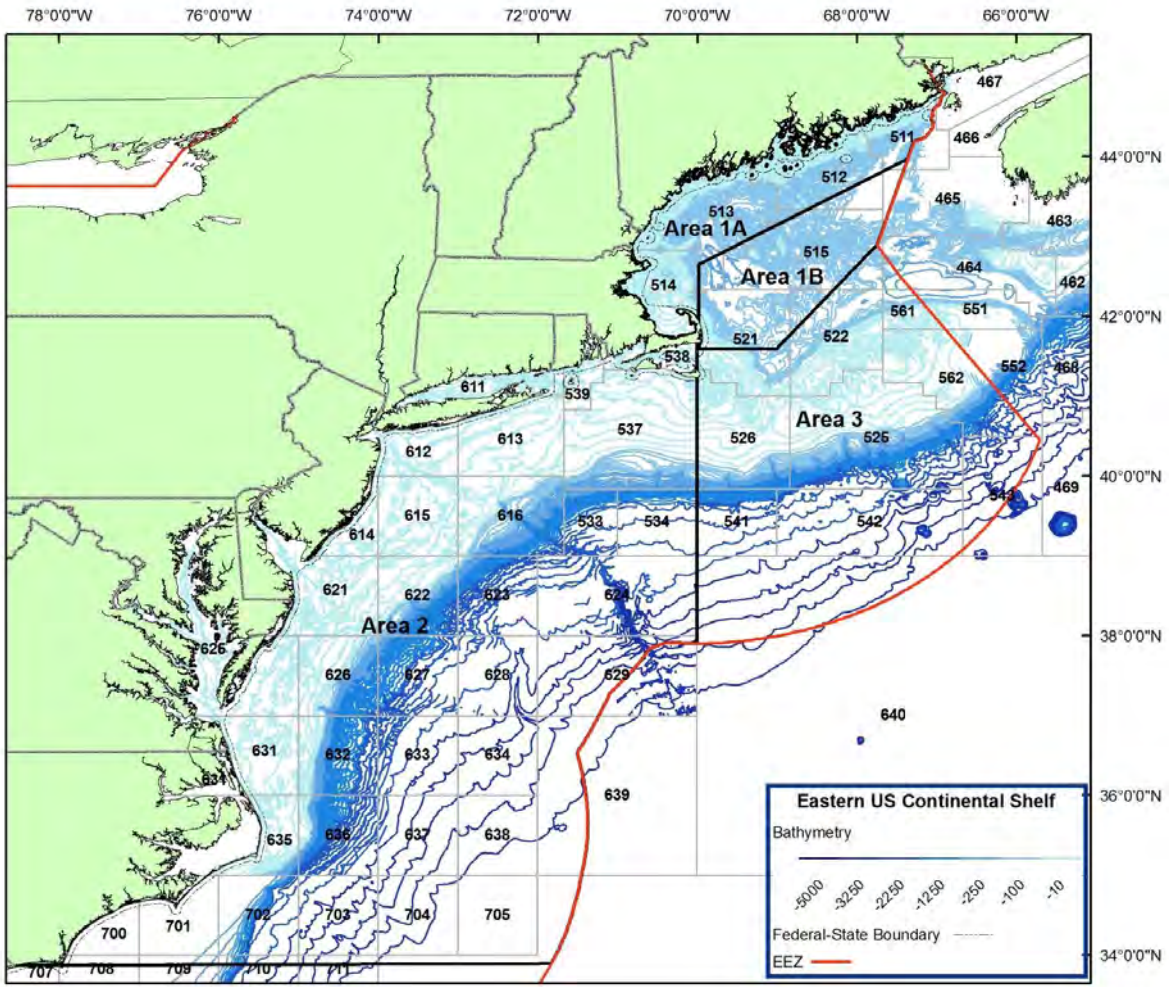


Figure 1: Study area of the Eastern US Continental Shelf. Overlapping Atlantic herring fishery management plan areas (Area 1A, 1B, 2, and 3) and fisheries management statistical areas (400-700s) indicated.

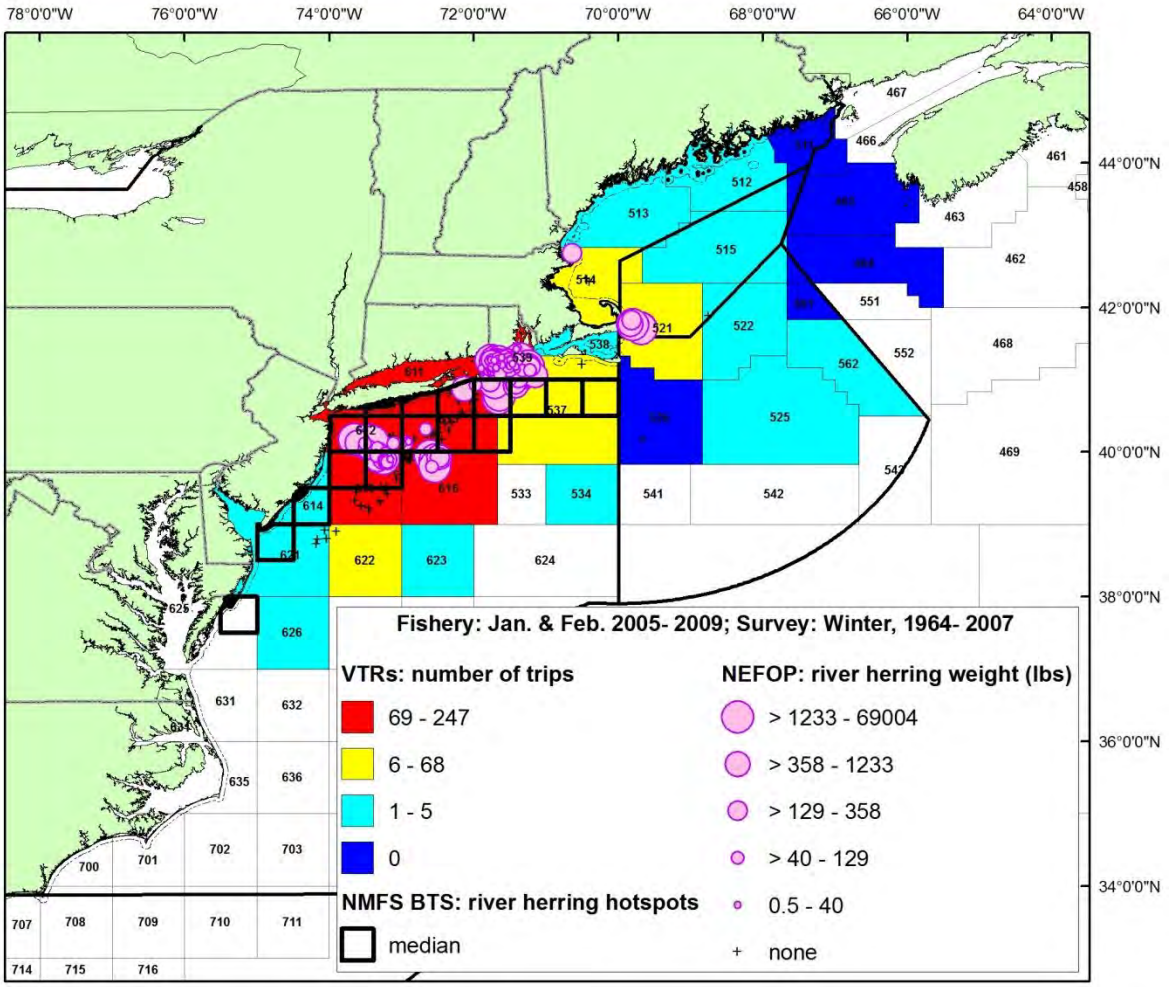


Figure 2: Reported trips (VTR) and observed hauls and sets (NEFOP) during January and February, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-247 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Winter candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Winter 1963-2007 NMFS bottom-trawl surveys.

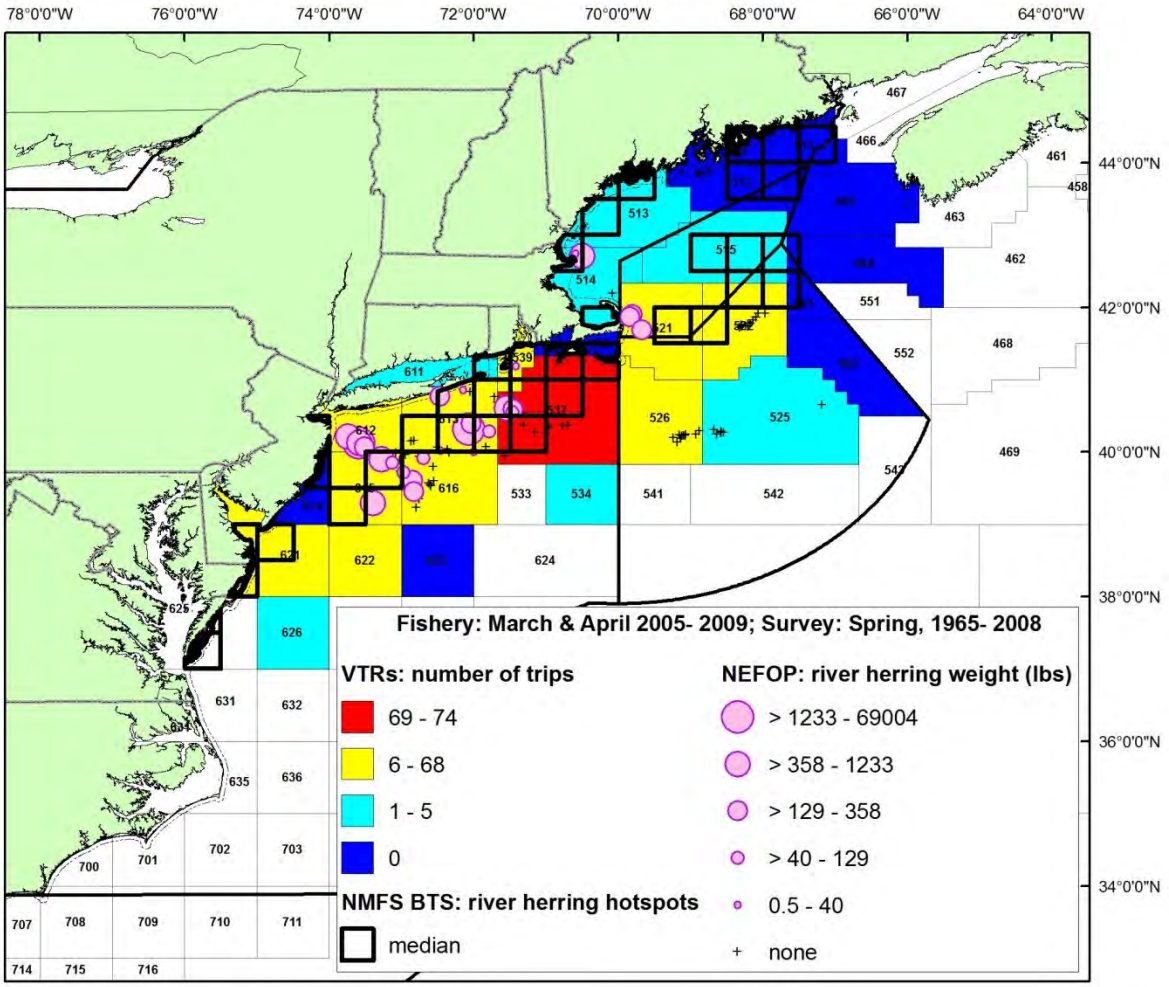


Figure 3: Reported trips (VTR) and observed hauls and sets (NEFOP) during March and April, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-74 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Spring candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Spring 1965-2008 NMFS bottom-trawl surveys.

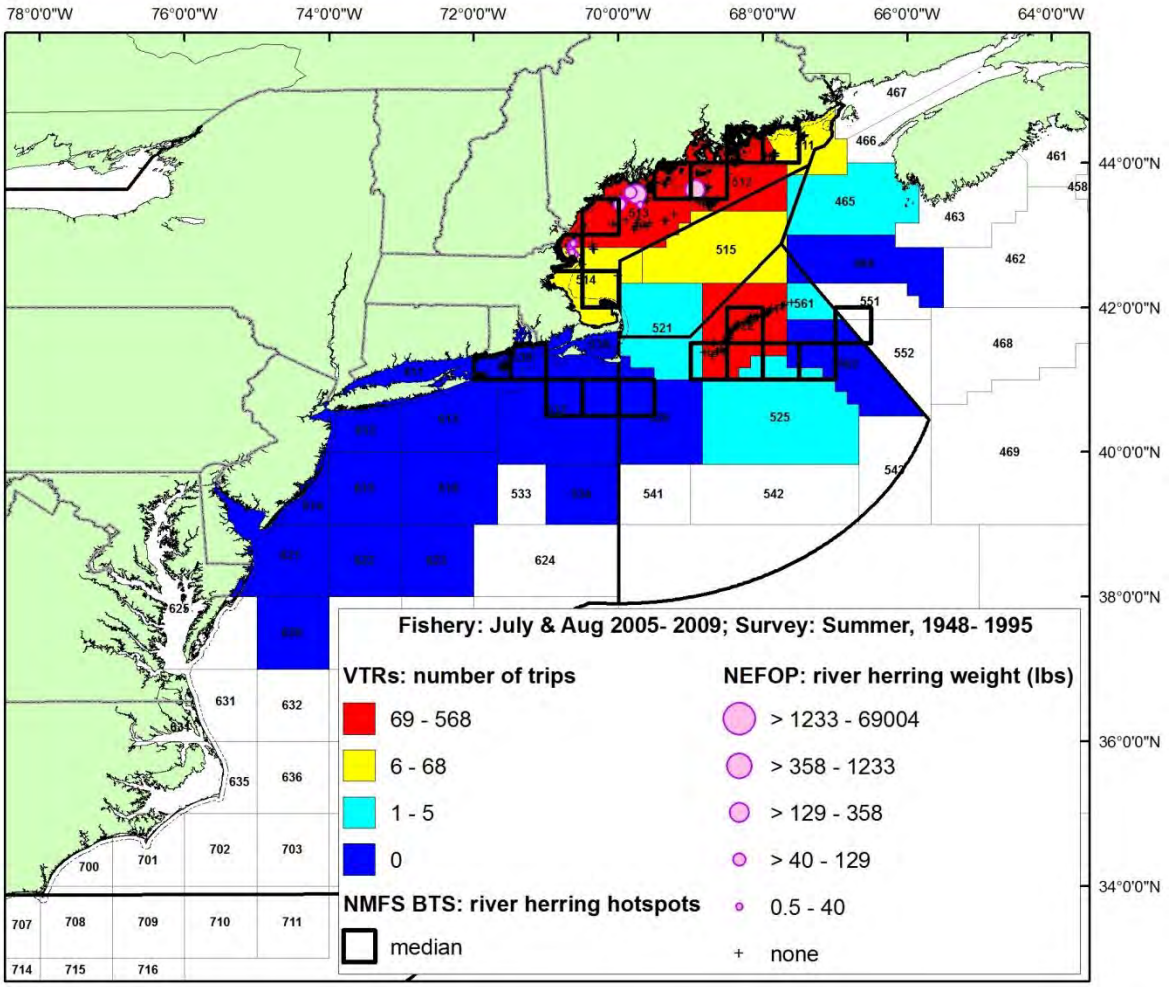


Figure 4: Reported trips (VTR) and observed hauls and sets (NEFOP) during July and August, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-568 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Summer candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Summer 1948-1995 NMFS bottom-trawl surveys.

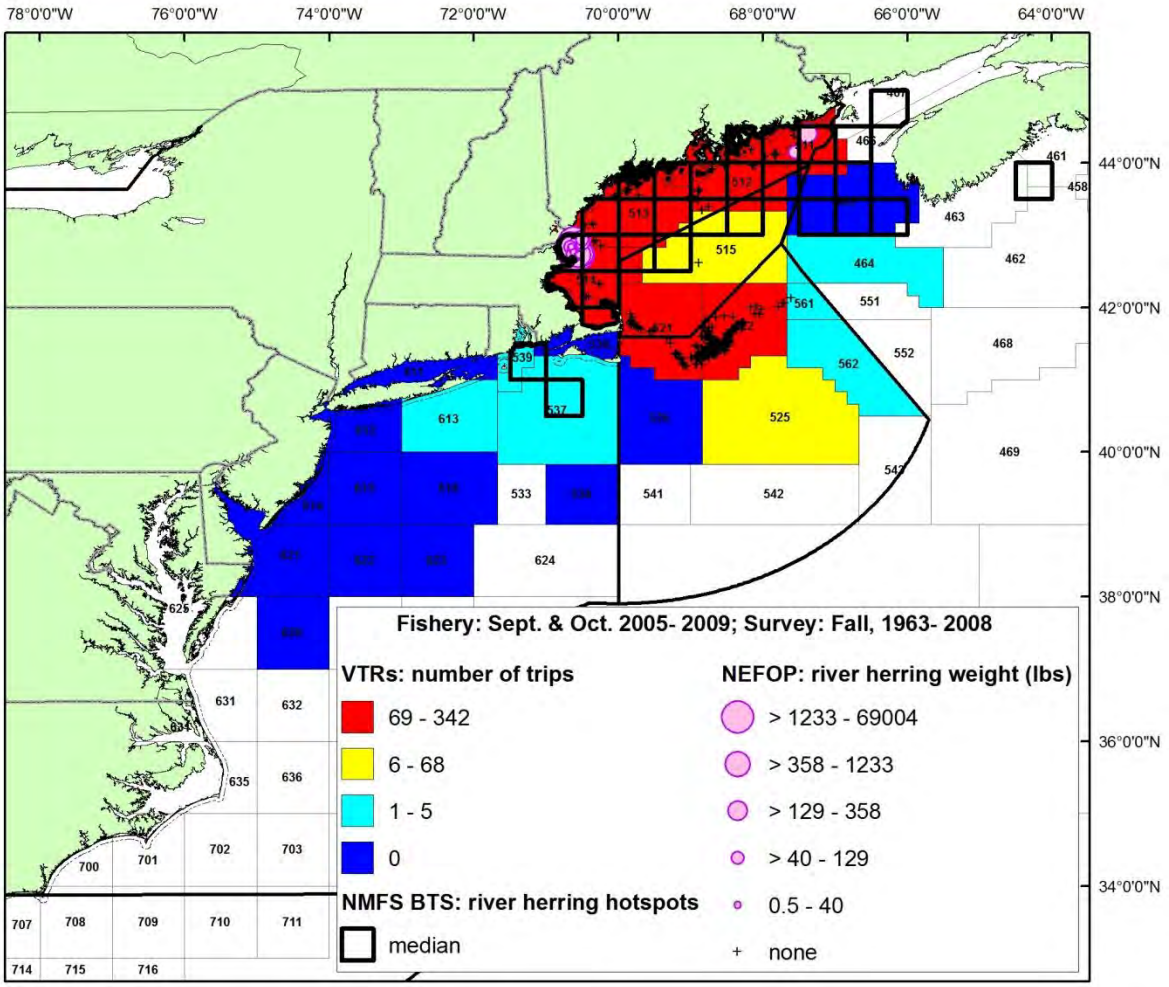


Figure 5: Reported trips (VTR) and observed hauls and sets (NEFOP) during September and October, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-342(red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Fall candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Fall 1963-2008 NMFS bottom-trawl surveys.

Appendix

Tables

Jan-Feb	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	0	0
511	0	0	0	0
512	0	1	0	1
513	0	2	0	2
514	0	14	0	14
515	0	1	0	1
521	1	22	0	23
522	0	2	0	2
525	0	1	0	1
526	0	0	0	0
534	1	1	0	2
537	40	24	0	64
538	2	2	0	4
539	144	103	0	247
561	0	0	0	0
562	0	2	0	2
611	77	31	0	108
612	6	100	0	106
613	20	95	0	115
614	0	1	0	1
615	23	99	0	122
616	19	51	0	70
621	1	3	0	4
622	3	9	0	12
623	0	1	0	1
626	0	2	0	2

Table A1: Number of directed herring trips separated by gear and statistical area for January-February. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Mar-Apr	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	0	0
511	0	0	0	0
512	0	0	0	0
513	0	5	0	5
514	0	5	0	5
515	0	1	0	1
521	0	6	0	6
522	0	20	0	20
525	0	2	0	2
526	1	11	0	12
534	0	1	0	1
537	19	55	0	74
538	0	0	0	0
539	24	16	0	40
561	0	0	0	0
562	0	0	0	0
611	3	2	0	5
612	2	32	0	34
613	12	36	0	48
614	0	0	0	0
615	2	29	0	31
616	6	36	0	42
621	1	7	0	8
622	2	15	0	17
623	0	0	0	0
626	0	4	0	4

Table A2: Number of directed herring trips separated by gear and statistical area for March-April. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

May-Jun	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	0	0
511	0	8	2	10
512	0	10	76	86
513	1	276	121	398
514	0	35	1	36
515	0	34	8	42
521	0	35	2	37
522	0	7	0	7
525	0	0	0	0
526	0	1	0	1
534	0	0	0	0
537	1	20	0	21
538	0	0	0	0
539	2	0	0	2
561	0	0	0	0
562	0	0	0	0
611	1	0	0	1
612	1	0	0	1
613	1	1	0	2
614	0	0	0	0
615	0	0	0	0
616	1	0	0	1
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A3: Number of directed herring trips separated by gear and statistical area for May-June. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Jul-Aug	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	0	2	2
511	0	8	60	68
512	3	134	360	497
513	184	160	224	568
514	37	17	5	59
515	0	8	15	23
521	0	1	0	1
522	2	71	1	74
525	0	1	0	1
526	0	0	0	0
534	0	0	0	0
537	0	0	0	0
538	0	0	0	0
539	0	0	0	0
561	0	5	0	5
562	0	0	0	0
611	0	0	0	0
612	0	0	0	0
613	0	0	0	0
614	0	0	0	0
615	0	0	0	0
616	0	0	0	0
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A4: Number of directed herring trips separated by gear and statistical area for July-August. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Sep-Oct	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	1	1
465	0	0	0	0
511	0	24	112	136
512	0	31	77	108
513	69	153	120	342
514	72	115	5	192
515	0	5	6	11
521	1	92	0	93
522	1	153	2	156
525	1	6	0	7
526	0	0	0	0
534	0	0	0	0
537	0	1	0	1
538	0	0	0	0
539	0	1	0	1
561	0	1	0	1
562	0	1	0	1
611	0	0	0	0
612	0	0	0	0
613	0	3	0	3
614	0	0	0	0
615	0	0	0	0
616	0	0	0	0
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A5: Number of directed herring trips separated by gear and statistical area for September-October. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Nov-Dec	Gear Category			
Statistical Area	OT	PR	PS	ALL
464	0	0	0	0
465	0	1	0	1
511	0	1	0	1
512	0	1	0	1
513	2	35	5	42
514	9	118	6	133
515	0	0	0	0
521	6	120	0	126
522	0	12	0	12
525	0	0	0	0
526	0	1	0	1
534	0	0	0	0
537	2	19	0	21
538	0	0	0	0
539	93	21	0	114
561	0	1	0	1
562	0	0	0	0
611	43	10	0	53
612	2	1	0	3
613	8	3	0	11
614	1	0	0	1
615	0	0	0	0
616	0	0	0	0
621	0	0	0	0
622	0	0	0	0
623	0	0	0	0
626	0	0	0	0

Table A6: Number of directed herring trips separated by gear and statistical area for November-December. Directed herring trips defined as 2,000 lbs of kept Atlantic herring on a trip. Gear categories include bottom otter-trawl (OT), purse seine (PS) and mid-water trawl (PR). Mid-water trawl (PR) refers to pair and single mid-water trawls. Source: Vessel Trip Report Database 2005-2009.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
38753	91.1%	45	22.5	1013	2.0	11.0	23.0	50.4	266
37754	87.5%	24	77.6	1862	1.0	7.0	33.0	129.9	1213
40714	86.8%	114	36.2	4123	2.0	8.0	24.8	58.0	1002
40712	85.6%	90	46.1	4145	3.0	12.0	43.5	112.1	671
40741	84.6%	13	24.4	317	1.0	4.0	32.0	66.8	92
41684	83.6%	61	22.0	1343	3.0	7.0	18.0	60.0	200
41703	83.1%	83	44.1	3662	1.0	11.0	41.5	105.6	685
41712	81.2%	69	36.0	2481	2.0	7.0	15.0	92.6	843
40723	80.9%	251	26.5	6652	1.0	5.0	18.0	64.0	646
40713	80.0%	90	24.3	2185	1.0	7.5	19.5	38.0	408
40721	79.2%	96	51.1	4907	1.0	7.5	37.3	112.5	886
38751	79.1%	86	31.4	2701	1.0	4.0	19.3	52.5	483
42704	79.0%	62	67.0	4157	1.3	14.5	38.8	146.8	1202
44672	78.5%	79	16.5	1306	1.0	3.0	12.0	33.4	261
39743	74.6%	122	19.1	2336	0.3	3.0	7.8	39.9	584
39733	74.0%	73	27.6	2018	0.0	3.0	12.0	77.2	326
40722	73.7%	76	15.0	1139	0.0	3.0	7.3	44.0	185
41711	73.5%	83	26.5	2199	0.0	3.0	11.5	54.8	426
37752	73.1%	171	15.0	2561	0.0	2.0	8.0	26.0	713
38744	72.1%	233	14.5	3367	0.0	2.0	8.0	23.0	852
40711	71.2%	118	28.5	3365	0.0	2.0	14.8	64.3	892
43701	70.2%	94	18.2	1711	0.0	2.0	9.0	50.1	227
39732	70.0%	60	17.6	1057	0.0	2.0	13.3	29.3	366
43683	69.2%	78	16.0	1245	0.0	3.0	10.0	43.3	215
43694	68.8%	16	15.9	254	0.0	4.0	14.0	46.0	105

Table A7: Spring candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
38753	91.1%	45	22.5	1013	2.0	11.0	23.0	50.4	266
37754	87.5%	24	77.6	1862	1.0	7.0	33.0	129.9	1213
40714	86.8%	114	36.2	4123	2.0	8.0	24.8	58.0	1002
40712	85.6%	90	46.1	4145	3.0	12.0	43.5	112.1	671
40741	84.6%	13	24.4	317	1.0	4.0	32.0	66.8	92
44671	84.4%	64	5.5	352	1.0	3.0	8.3	15.7	29
41684	83.6%	61	22.0	1343	3.0	7.0	18.0	60.0	200
41703	83.1%	83	44.1	3662	1.0	11.0	41.5	105.6	685
40704	81.5%	65	13.1	851	1.0	4.0	12.0	20.0	264
41712	81.2%	69	36.0	2481	2.0	7.0	15.0	92.6	843
40723	80.9%	251	26.5	6652	1.0	5.0	18.0	64.0	646
40713	80.0%	90	24.3	2185	1.0	7.5	19.5	38.0	408
41702	79.2%	53	11.4	603	1.0	2.0	10.0	29.8	139
42674	79.2%	53	3.0	157	1.0	2.0	4.0	7.8	12
42683	79.2%	53	5.2	277	1.0	3.0	8.0	11.8	37
40721	79.2%	96	51.1	4907	1.0	7.5	37.3	112.5	886
38751	79.1%	86	31.4	2701	1.0	4.0	19.3	52.5	483
42704	79.0%	62	67.0	4157	1.3	14.5	38.8	146.8	1202
44672	78.5%	79	16.5	1306	1.0	3.0	12.0	33.4	261
39743	74.6%	122	19.1	2336	0.3	3.0	7.8	39.9	584
42672	74.5%	94	7.6	718	0.3	3.0	9.0	21.4	73
42681	74.1%	58	12.6	733	0.3	4.0	11.8	25.9	150
39733	74.0%	73	27.6	2018	0.0	3.0	12.0	77.2	326
40722	73.7%	76	15.0	1139	0.0	3.0	7.3	44.0	185
41711	73.5%	83	26.5	2199	0.0	3.0	11.5	54.8	426
44681	73.3%	15	11.4	171	1.0	5.0	8.0	24.6	84
37752	73.1%	171	15.0	2561	0.0	2.0	8.0	26.0	713
38744	72.1%	233	14.5	3367	0.0	2.0	8.0	23.0	852
43674	72.1%	43	12.0	516	0.0	2.0	8.5	27.8	157
40711	71.2%	118	28.5	3365	0.0	2.0	14.8	64.3	892
41693	70.7%	82	11.0	906	0.0	4.0	12.0	29.8	131
43701	70.2%	94	18.2	1711	0.0	2.0	9.0	50.1	227
42684	70.1%	77	8.9	683	0.0	3.0	11.0	24.8	66
39732	70.0%	60	17.6	1057	0.0	2.0	13.3	29.3	366
43683	69.2%	78	16.0	1245	0.0	3.0	10.0	43.3	215
41701	69.0%	42	6.0	252	0.0	2.0	4.0	20.5	44
43694	68.8%	16	15.9	254	0.0	4.0	14.0	46.0	105

Table A8: Spring candidate “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
38753	91.1%	45	22.5	1013	2.0	11.0	23.0	50.4	266
37754	87.5%	24	77.6	1862	1.0	7.0	33.0	129.9	1213
40714	86.8%	114	36.2	4123	2.0	8.0	24.8	58.0	1002
40712	85.6%	90	46.1	4145	3.0	12.0	43.5	112.1	671
40741	84.6%	13	24.4	317	1.0	4.0	32.0	66.8	92
41684	83.6%	61	22.0	1343	3.0	7.0	18.0	60.0	200
41703	83.1%	83	44.1	3662	1.0	11.0	41.5	105.6	685
40704	81.5%	65	13.1	851	1.0	4.0	12.0	20.0	264
41712	81.2%	69	36.0	2481	2.0	7.0	15.0	92.6	843
40723	80.9%	251	26.5	6652	1.0	5.0	18.0	64.0	646
40713	80.0%	90	24.3	2185	1.0	7.5	19.5	38.0	408
41702	79.2%	53	11.4	603	1.0	2.0	10.0	29.8	139
40721	79.2%	96	51.1	4907	1.0	7.5	37.3	112.5	886
38751	79.1%	86	31.4	2701	1.0	4.0	19.3	52.5	483
42704	79.0%	62	67.0	4157	1.3	14.5	38.8	146.8	1202
44672	78.5%	79	16.5	1306	1.0	3.0	12.0	33.4	261
42672	74.5%	94	7.6	718	0.3	3.0	9.0	21.4	73
42681	74.1%	58	12.6	733	0.3	4.0	11.8	25.9	150
39733	74.0%	73	27.6	2018	0.0	3.0	12.0	77.2	326
41711	73.5%	83	26.5	2199	0.0	3.0	11.5	54.8	426
40711	71.2%	118	28.5	3365	0.0	2.0	14.8	64.3	892
41693	70.7%	82	11.0	906	0.0	4.0	12.0	29.8	131
43701	70.2%	94	18.2	1711	0.0	2.0	9.0	50.1	227
42684	70.1%	77	8.9	683	0.0	3.0	11.0	24.8	66
39732	70.0%	60	17.6	1057	0.0	2.0	13.3	29.3	366
43683	69.2%	78	16.0	1245	0.0	3.0	10.0	43.3	215
43694	68.8%	16	15.9	254	0.0	4.0	14.0	46.0	105

Table A9: Spring candidate “hot spot” quarter degree squares identified as squares with percent occurrence and catch in number ≥ the 75th quantiles of both variables. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44672	65.0%	20	15.0	299	0.0	3.0	14.5	45.7	81
44681	60.0%	15	8.3	124	0.0	3.0	7.0	23.2	58
40703	53.8%	26	26.0	676	0.0	1.0	3.0	29.5	520
43693	50.0%	14	72.2	1011	0.0	1.0	46.5	199.1	610
41682	38.2%	34	5.2	178	0.0	0.0	3.0	15.4	65
41672	34.4%	32	36.7	1175	0.0	0.0	25.3	123.2	298
40704	33.3%	15	5.2	78	0.0	0.0	4.0	18.4	37
41711	33.3%	12	21.4	257	0.0	0.0	4.3	17.6	224
40694	28.6%	28	111.6	3124	0.0	0.0	1.8	77.7	2431
41683	25.8%	31	6.1	190	0.0	0.0	0.5	6.0	62
41664	25.0%	20	7.9	157	0.0	0.0	2.0	19.8	86
41671	25.0%	24	9.3	223	0.0	0.0	0.5	8.7	181
41681	24.1%	29	22.4	650	0.0	0.0	0.0	86.6	178

Table A10: Summer candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44672	65.0%	20	15.0	299	0.0	3.0	14.5	45.7	81
44681	60.0%	15	8.3	124	0.0	3.0	7.0	23.2	58
40703	53.8%	26	26.0	676	0.0	1.0	3.0	29.5	520
43693	50.0%	14	72.2	1011	0.0	1.0	46.5	199.1	610
42704	46.2%	26	3.7	97	0.0	0.0	4.0	10.0	37
43684	38.5%	26	3.5	90	0.0	0.0	2.8	6.0	54
41682	38.2%	34	5.2	178	0.0	0.0	3.0	15.4	65
41672	34.4%	32	36.7	1175	0.0	0.0	25.3	123.2	298
43701	34.1%	41	2.0	84	0.0	0.0	2.0	5.0	30
40704	33.3%	15	5.2	78	0.0	0.0	4.0	18.4	37
41711	33.3%	12	21.4	257	0.0	0.0	4.3	17.6	224
41712	29.4%	17	1.1	18	0.0	0.0	1.0	3.4	8
40694	28.6%	28	111.6	3124	0.0	0.0	1.8	77.7	2431
41683	25.8%	31	6.1	190	0.0	0.0	0.5	6.0	62
41664	25.0%	20	7.9	157	0.0	0.0	2.0	19.8	86
41671	25.0%	24	9.3	223	0.0	0.0	0.5	8.7	181
41681	24.1%	29	22.4	650	0.0	0.0	0.0	86.6	178
42701	24.1%	58	3.0	176	0.0	0.0	0.0	6.0	99

Table A11: Summer candidate “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44672	65.0%	20	15.0	299	0.0	3.0	14.5	45.7	81
44681	60.0%	15	8.3	124	0.0	3.0	7.0	23.2	58
40703	53.8%	26	26.0	676	0.0	1.0	3.0	29.5	520
43693	50.0%	14	72.2	1011	0.0	1.0	46.5	199.1	610
42704	46.2%	26	3.7	97	0.0	0.0	4.0	10.0	37
43684	38.5%	26	3.5	90	0.0	0.0	2.8	6.0	54
41682	38.2%	34	5.2	178	0.0	0.0	3.0	15.4	65
41672	34.4%	32	36.7	1175	0.0	0.0	25.3	123.2	298
43701	34.1%	41	2.0	84	0.0	0.0	2.0	5.0	30
40704	33.3%	15	5.2	78	0.0	0.0	4.0	18.4	37
41711	33.3%	12	21.4	257	0.0	0.0	4.3	17.6	224
41712	29.4%	17	1.1	18	0.0	0.0	1.0	3.4	8
40694	28.6%	28	111.6	3124	0.0	0.0	1.8	77.7	2431
41683	25.8%	31	6.1	190	0.0	0.0	0.5	6.0	62
41664	25.0%	20	7.9	157	0.0	0.0	2.0	19.8	86
41671	25.0%	24	9.3	223	0.0	0.0	0.5	8.7	181
41681	24.1%	29	22.4	650	0.0	0.0	0.0	86.6	178
42701	24.1%	58	3.0	176	0.0	0.0	0.0	6.0	99

Table A12: Summer candidate “hot spot” quarter degree squares identified as squares with percent occurrence and catch in number ≥ the 75th quantiles of both variables. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44681	90.9%	22	21.0	462	2.0	5.0	30.3	74.7	110
41703	68.4%	76	49.0	3727	0.0	2.0	25.0	158.0	787
42704	67.7%	62	82.9	5139	0.0	3.0	35.3	84.6	1865
44672	64.9%	74	27.0	1999	0.0	2.0	14.3	59.3	533
43694	59.1%	22	5.8	128	0.0	2.0	5.8	13.4	38
42702	58.8%	51	45.7	2330	0.0	1.0	20.0	145.0	449
43684	55.0%	60	12.5	752	0.0	1.0	7.5	31.1	167
43693	50.0%	38	5.7	218	0.0	0.5	6.3	19.0	73
43683	48.4%	95	7.0	669	0.0	0.0	4.0	12.6	320
43643	47.4%	19	1.9	37	0.0	0.0	3.5	5.6	8
42701	43.3%	180	13.3	2401	0.0	0.0	3.0	11.3	452
43701	40.2%	107	4.0	427	0.0	0.0	3.0	11.4	80
44662	39.2%	79	2.8	223	0.0	0.0	3.0	6.2	58
43664	39.1%	110	4.4	483	0.0	0.0	4.0	14.1	62
43673	33.8%	80	4.4	348	0.0	0.0	1.0	3.1	227
44671	33.3%	81	2.7	216	0.0	0.0	1.0	6.0	53
43681	32.7%	55	2.2	120	0.0	0.0	1.0	4.8	36
43674	28.3%	60	1.8	107	0.0	0.0	1.0	3.0	57
42703	26.5%	132	2.3	306	0.0	0.0	1.0	3.0	93
41711	23.9%	71	14.4	1020	0.0	0.0	0.0	14.0	646

Table A13: Fall candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44681	90.9%	22	21.0	462	2.0	5.0	30.3	74.7	110
41703	68.4%	76	49.0	3727	0.0	2.0	25.0	158.0	787
42704	67.7%	62	82.9	5139	0.0	3.0	35.3	84.6	1865
44672	64.9%	74	27.0	1999	0.0	2.0	14.3	59.3	533
43694	59.1%	22	5.8	128	0.0	2.0	5.8	13.4	38
42702	58.8%	51	45.7	2330	0.0	1.0	20.0	145.0	449
43684	55.0%	60	12.5	752	0.0	1.0	7.5	31.1	167
43693	50.0%	38	5.7	218	0.0	0.5	6.3	19.0	73
43683	48.4%	95	7.0	669	0.0	0.0	4.0	12.6	320
43643	47.4%	19	1.9	37	0.0	0.0	3.5	5.6	8
42701	43.3%	180	13.3	2401	0.0	0.0	3.0	11.3	452
43701	40.2%	107	4.0	427	0.0	0.0	3.0	11.4	80
44662	39.2%	79	2.8	223	0.0	0.0	3.0	6.2	58
43664	39.1%	110	4.4	483	0.0	0.0	4.0	14.1	62
43673	33.8%	80	4.4	348	0.0	0.0	1.0	3.1	227
44671	33.3%	81	2.7	216	0.0	0.0	1.0	6.0	53
43681	32.7%	55	2.2	120	0.0	0.0	1.0	4.8	36
43674	28.3%	60	1.8	107	0.0	0.0	1.0	3.0	57
43662	28.2%	71	1.2	87	0.0	0.0	1.0	2.0	25
43671	28.1%	57	0.8	46	0.0	0.0	1.0	3.4	9
44663	27.3%	11	0.5	6	0.0	0.0	0.5	2.0	3
42703	26.5%	132	2.3	306	0.0	0.0	1.0	3.0	93
41711	23.9%	71	14.4	1020	0.0	0.0	0.0	14.0	646
43691	23.5%	81	1.3	108	0.0	0.0	0.0	2.0	37
42693	23.3%	90	1.0	88	0.0	0.0	0.0	3.1	17
43682	22.1%	95	1.3	124	0.0	0.0	0.0	4.0	18
42694	21.7%	92	1.0	88	0.0	0.0	0.0	2.0	23
43661	21.1%	19	0.7	14	0.0	0.0	0.0	2.0	9
40704	19.8%	81	1.1	93	0.0	0.0	0.0	2.0	31

Table A14: Fall candidate “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
44681	90.9%	22	21.0	462	2.0	5.0	30.3	74.7	110
41703	68.4%	76	49.0	3727	0.0	2.0	25.0	158.0	787
42704	67.7%	62	82.9	5139	0.0	3.0	35.3	84.6	1865
44672	64.9%	74	27.0	1999	0.0	2.0	14.3	59.3	533
43694	59.1%	22	5.8	128	0.0	2.0	5.8	13.4	38
42702	58.8%	51	45.7	2330	0.0	1.0	20.0	145.0	449
43684	55.0%	60	12.5	752	0.0	1.0	7.5	31.1	167
43693	50.0%	38	5.7	218	0.0	0.5	6.3	19.0	73
43683	48.4%	95	7.0	669	0.0	0.0	4.0	12.6	320
43643	47.4%	19	1.9	37	0.0	0.0	3.5	5.6	8
42701	43.3%	180	13.3	2401	0.0	0.0	3.0	11.3	452
43701	40.2%	107	4.0	427	0.0	0.0	3.0	11.4	80
44662	39.2%	79	2.8	223	0.0	0.0	3.0	6.2	58
43664	39.1%	110	4.4	483	0.0	0.0	4.0	14.1	62
43673	33.8%	80	4.4	348	0.0	0.0	1.0	3.1	227
44671	33.3%	81	2.7	216	0.0	0.0	1.0	6.0	53
43681	32.7%	55	2.2	120	0.0	0.0	1.0	4.8	36
43674	28.3%	60	1.8	107	0.0	0.0	1.0	3.0	57
43662	28.2%	71	1.2	87	0.0	0.0	1.0	2.0	25
43671	28.1%	57	0.8	46	0.0	0.0	1.0	3.4	9
44663	27.3%	11	0.5	6	0.0	0.0	0.5	2.0	3
42703	26.5%	132	2.3	306	0.0	0.0	1.0	3.0	93
41711	23.9%	71	14.4	1020	0.0	0.0	0.0	14.0	646
43691	23.5%	81	1.3	108	0.0	0.0	0.0	2.0	37
42693	23.3%	90	1.0	88	0.0	0.0	0.0	3.1	17
43682	22.1%	95	1.3	124	0.0	0.0	0.0	4.0	18
42694	21.7%	92	1.0	88	0.0	0.0	0.0	2.0	23
43661	21.1%	19	0.7	14	0.0	0.0	0.0	2.0	9
40704	19.8%	81	1.1	93	0.0	0.0	0.0	2.0	31

Table A15: Fall candidate “hot spot” quarter degree squares identified as squares with percent occurrence and catch in number ≥ the 75th quantiles of both variables. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
40713	91.3%	46	29.9	1376	2.3	6.0	28.0	49.5	326
39741	90.9%	22	23.4	515	2.5	7.0	22.3	45.6	197
40721	87.9%	33	13.1	431	3.0	7.0	15.0	32.8	58
38744	82.6%	23	30.0	690	2.0	5.0	23.5	74.8	261
40714	80.9%	47	29.0	1362	1.0	8.0	29.0	93.0	274
40732	79.2%	24	10.7	257	1.0	2.0	6.3	17.5	115
40722	77.8%	27	15.3	413	1.0	3.0	9.5	54.2	99
39734	77.4%	31	13.6	422	1.0	4.0	18.5	46.0	71
40704	71.4%	35	11.0	385	0.0	2.0	9.5	18.6	187
40724	69.6%	23	9.9	227	0.0	3.0	7.5	25.0	67
39733	69.2%	39	14.1	550	0.0	3.0	23.0	32.8	139
40712	69.0%	42	20.6	864	0.0	3.0	19.8	42.0	239

Table A16: Winter candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
40713	91.3%	46	29.9	1376	2.3	6.0	28.0	49.5	326
39741	90.9%	22	23.4	515	2.5	7.0	22.3	45.6	197
40721	87.9%	33	13.1	431	3.0	7.0	15.0	32.8	58
38744	82.6%	23	30.0	690	2.0	5.0	23.5	74.8	261
40714	80.9%	47	29.0	1362	1.0	8.0	29.0	93.0	274
37753	80.0%	20	7.6	152	1.0	3.5	12.5	15.3	39
40732	79.2%	24	10.7	257	1.0	2.0	6.3	17.5	115
40722	77.8%	27	15.3	413	1.0	3.0	9.5	54.2	99
39734	77.4%	31	13.6	422	1.0	4.0	18.5	46.0	71
40723	75.0%	52	7.9	410	0.8	3.0	9.5	19.9	95
40704	71.4%	35	11.0	385	0.0	2.0	9.5	18.6	187
40724	69.6%	23	9.9	227	0.0	3.0	7.5	25.0	67
39733	69.2%	39	14.1	550	0.0	3.0	23.0	32.8	139
40712	69.0%	42	20.6	864	0.0	3.0	19.8	42.0	239
40703	66.7%	39	9.3	362	0.0	2.0	4.0	25.6	79
40733	66.7%	12	3.8	45	0.0	2.5	5.0	5.9	20

Table A17: Winter candidate “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

Quarter degree square	Percent occurrence	Count of tows	Mean	Total catch numbers	25th quantile	median	75th quantile	90th quantile	Maximum catch
40713	91.3%	46	29.9	1376	2.3	6.0	28.0	49.5	326
39741	90.9%	22	23.4	515	2.5	7.0	22.3	45.6	197
40721	87.9%	33	13.1	431	3.0	7.0	15.0	32.8	58
38744	82.6%	23	30.0	690	2.0	5.0	23.5	74.8	261
40714	80.9%	47	29.0	1362	1.0	8.0	29.0	93.0	274
37753	80.0%	20	7.6	152	1.0	3.5	12.5	15.3	39
40722	77.8%	27	15.3	413	1.0	3.0	9.5	54.2	99
39734	77.4%	31	13.6	422	1.0	4.0	18.5	46.0	71
40723	75.0%	52	7.9	410	0.8	3.0	9.5	19.9	95
40704	71.4%	35	11.0	385	0.0	2.0	9.5	18.6	187
40724	69.6%	23	9.9	227	0.0	3.0	7.5	25.0	67
40711	69.4%	49	9.1	444	0.0	1.0	7.0	20.4	180
39733	69.2%	39	14.1	550	0.0	3.0	23.0	32.8	139
40712	69.0%	42	20.6	864	0.0	3.0	19.8	42.0	239

Table A18: Winter candidate “hot spot” quarter degree squares identified as squares with percent occurrence and catch in number ≥ the 75th quantiles of both variables. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

Table A19: Migration patterns of alewife, blueback, and American shad in state fresh waters (following three pages). Note that New Jersey is currently a place holder and will be updated. “SA” indicates some activity and “PA” indicates peak activity. ASMFC Shad and River herring Technical Committee 2010.

ALEWIFE

SA: Some Activity; PA: Peak Activity

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration					SA	SA	SA	PA	PA	PA	PA	SA												
	adult emmigration										SA	SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA			
	spawning								SA	SA	PA	PA	PA	SA											
	incubation								SA	SA	PA	PA	PA	SA											
	juvenile freshwater residence								SA	SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA		
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	
New Hampshire	adult immigration									SA	PA	PA	SA	SA											
	adult emmigration										SA	PA	PA	SA											
	spawning									SA	PA	PA	PA	SA											
	incubation										SA	PA	PA	SA											
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA				
	juvenile emigration															SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration					SA	SA	PA	PA	PA	SA														
	adult emigration								SA	SA	PA	PA	SA	SA											
	spawning						SA	SA	PA	PA	SA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA	SA		
	juvenile emigration												SA	PA	PA	SA	SA	PA	PA	PA	PA	SA	SA	SA	
Rhode Island	adult immigration					SA	SA	PA	PA	PA	SA														
	adult emmigration							SA	PA	PA	SA	SA	SA												
	spawning						SA	PA	PA	PA	SA														
	incubation						SA	PA	PA	PA	PA	SA													
	juvenile freshwater residence								SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA		
	juvenile emigration											SA	SA	SA	SA	SA	SA	SA	PA	PA	PA	SA	SA		
Connecticut	adult immigration				SA	SA	PA	PA	PA	SA															
	adult emmigration				SA	SA	SA	PA	PA	SA															
	spawning				SA	SA	SA	SA	SA	SA															
	incubation					SA	PA																		
	juvenile freshwater residence							SA	SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA	SA					
	juvenile emigration									SA	PA	PA	SA	SA	SA	SA	SA	SA	SA	SA					
New York	adult immigration						SA	PA	PA	PA	SA														
	adult emmigration							SA	SA	PA	SA	SA													
	spawning							SA	PA	PA	PA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA						
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration																								
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								

BLUEBACK HERRING

SA: Some Activity; PA: Peak Activity

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration							SA	SA	SA	SA	PA	PA	PA	SA										
	adult emmigration											SA	SA	PA	PA	PA	SA								
	spawning									SA	PA	PA	PA	SA											
	incubation										SA	PA	PA	SA											
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	PA	PA	PA	PA	PA	SA			
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	PA	SA	SA		
New Hampshire	adult immigration								SA	PA	PA	SA													
	adult emmigration									SA	PA	PA	SA	SA											
	spawning									PA	PA	SA													
	incubation									SA	PA	PA	SA												
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA				
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration								SA	SA	PA	PA	SA	SA											
	adult emigration										SA	PA	PA	SA	SA										
	spawning									SA	PA	PA	SA	SA											
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence									SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	PA	PA	PA	SA	SA	SA	SA		
Rhode Island	adult immigration							SA	PA	PA															
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								
Connecticut	adult immigration							SA	SA	PA	PA	SA	SA												
	adult emmigration										SA	SA	PA	PA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	PA	PA	SA	SA											
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA			
	juvenile emigration													SA	SA	PA	PA	PA	PA	PA	SA	SA			
New York	adult immigration							SA	PA	PA	SA	SA													
	adult emmigration								SA	PA	SA	SA	SA												
	spawning							SA	PA	PA	PA	SA	SA												
	incubation							SA	PA	PA	PA	SA	SA												
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA						
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration																								
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								

AMERICAN SHAD

SA: Some Activity; PA: Peak Activity

		January		February		March		April		May		June		July		August		September		October		November		December	
		1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30	1-15	16-30
Maine	adult immigration						SA	SA	SA	PA	PA	PA	PA	PA	PA	SA									
	adult emmigration												SA	SA	PA	PA	SA								
	spawning										SA	SA	PA	PA	PA	SA									
	incubation										SA	SA	PA	PA	PA	SA									
	juvenile freshwater residence											SA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA			
	juvenile emigration													SA	SA	SA	PA	PA	PA	PA	SA	SA			
New Hampshire	adult immigration									SA	PA	PA	SA												
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence											PA	PA	PA	PA	SA	SA	SA	SA	SA	SA				
	juvenile emigration															SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration								SA	SA	PA	PA	PA	SA	SA										
	adult emmigration									SA	PA	PA	PA	SA	SA										
	spawning									SA	PA	PA	PA	SA	SA										
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence										SA	PA	PA	PA	PA	PA	PA	SA	SA	SA					
	juvenile emigration													SA	SA	SA	PA	PA	SA	SA	SA				
Rhode Island	adult immigration							SA	SA	PA	PA	PA	SA												
	adult emmigration									SA	SA	PA	PA	SA	SA										
	spawning									SA	SA	PA	PA	PA	SA										
	incubation									SA	SA	PA	PA	PA	SA										
	juvenile freshwater residence										SA	SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA		
	juvenile emigration													SA	SA	SA	PA	PA	SA	SA	SA	SA	SA		
Connecticut	adult immigration							SA	SA	PA	PA	SA	SA												
	adult emmigration										SA	SA	PA	PA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	PA	PA	SA	SA											
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	PA	PA	SA	SA	SA			
	juvenile emigration													SA	SA	SA	SA	PA	PA	PA	SA	SA			
New York	adult immigration							SA	PA	PA	SA	SA													
	adult emmigration								SA	PA	PA	SA													
	spawning								SA	PA	PA	SA													
	incubation								SA	PA	PA	SA													
	juvenile freshwater residence										PA	PA	PA	PA	PA	PA	SA	SA	SA	SA					
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
New Jersey	adult immigration																								
	adult emmigration																								
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								

Figures

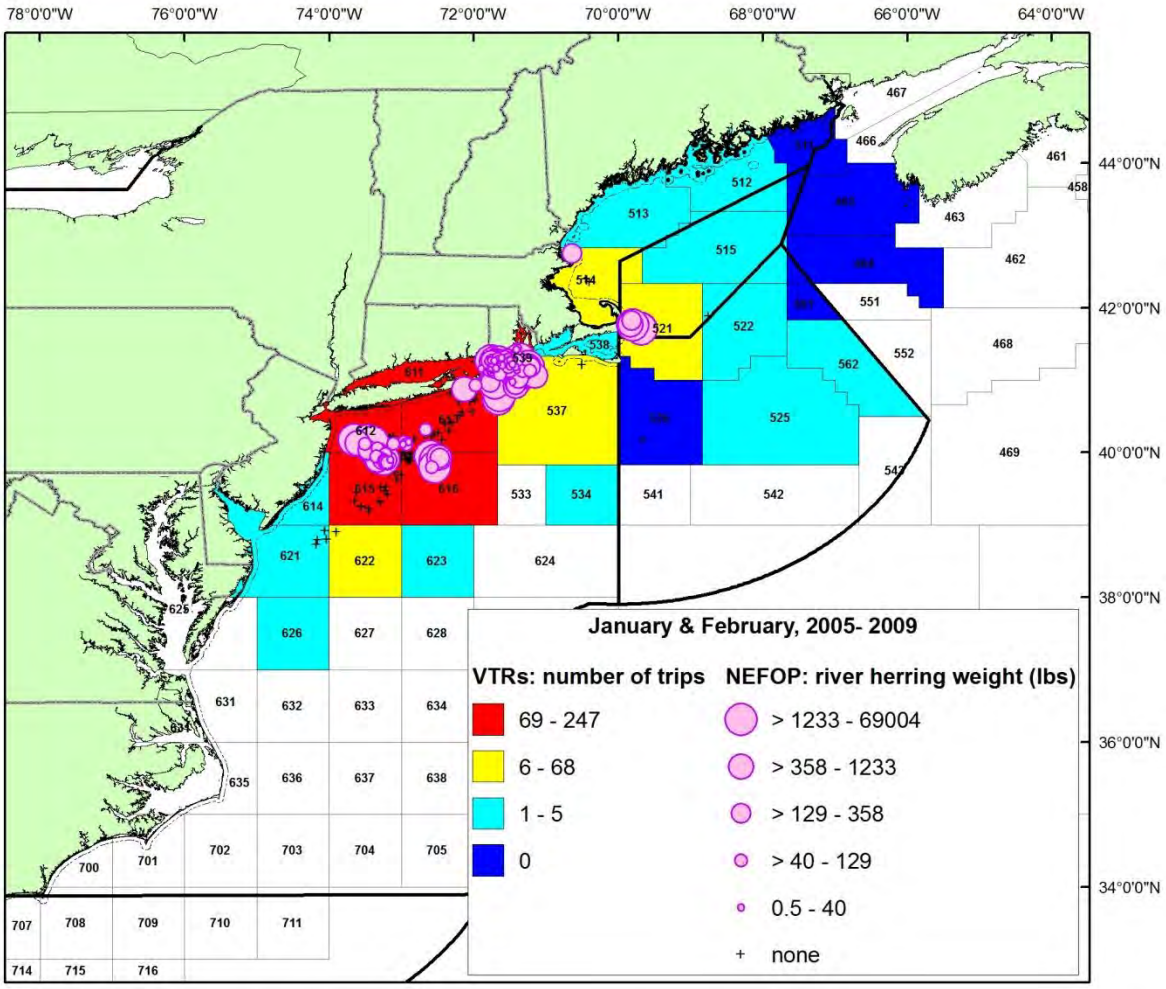


Figure A1: Reported trips (VTR) and observed hauls and sets (NEFOP) during January and February, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-247 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

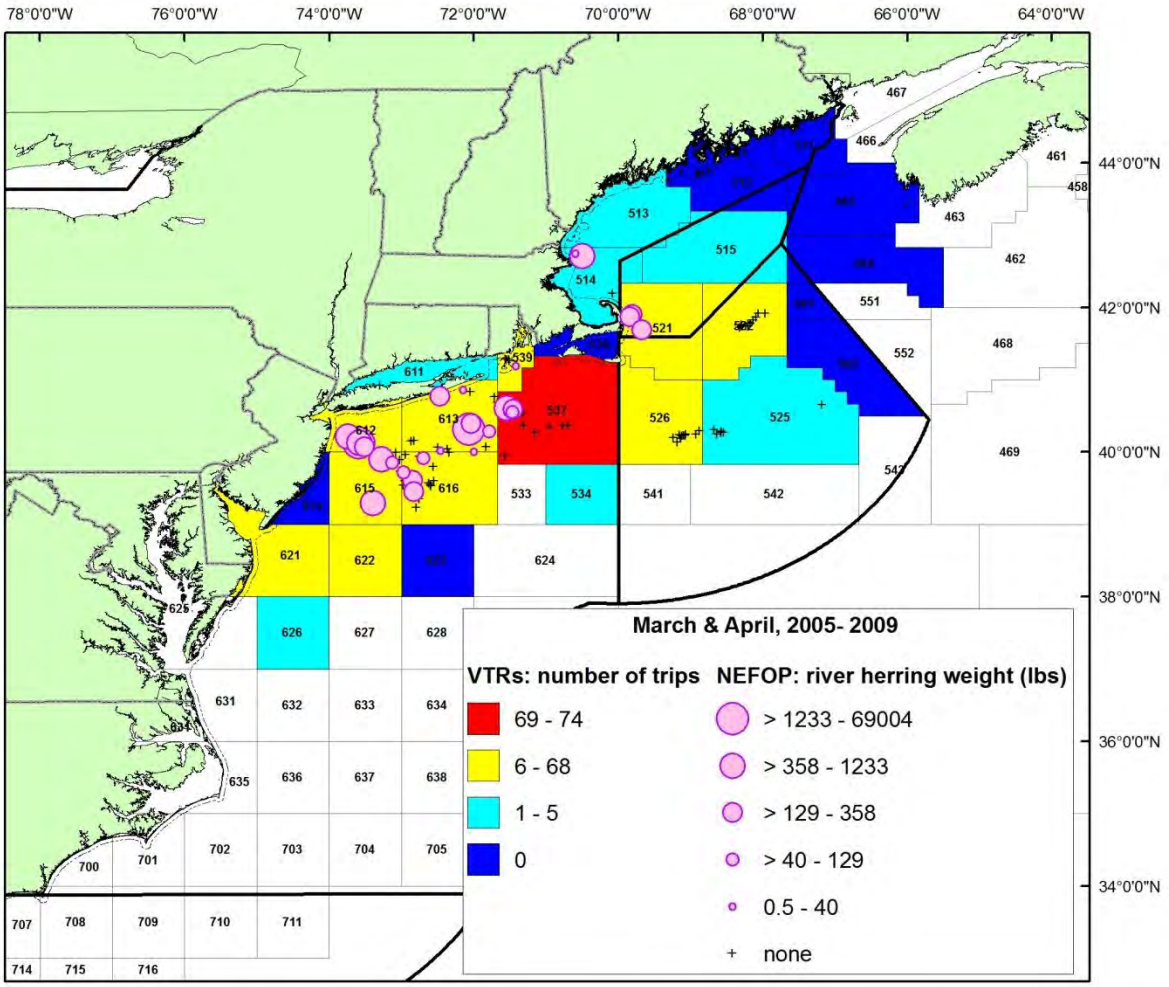


Figure A2: Reported trips (VTR) and observed hauls and sets (NEFOP) during March and April, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-74 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

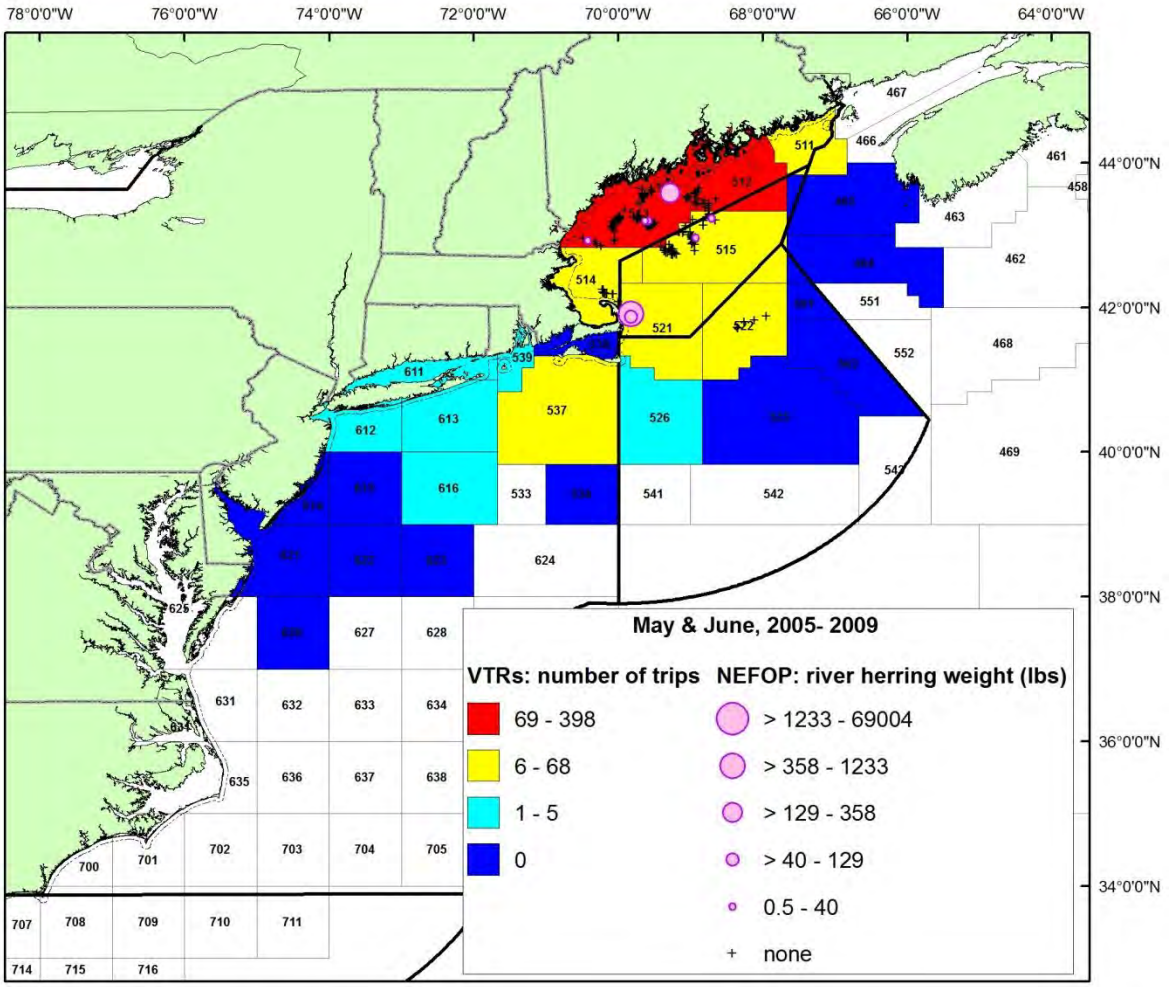


Figure A3: Reported trips (VTR) and observed hauls and sets (NEFOP) during May and June, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-398 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

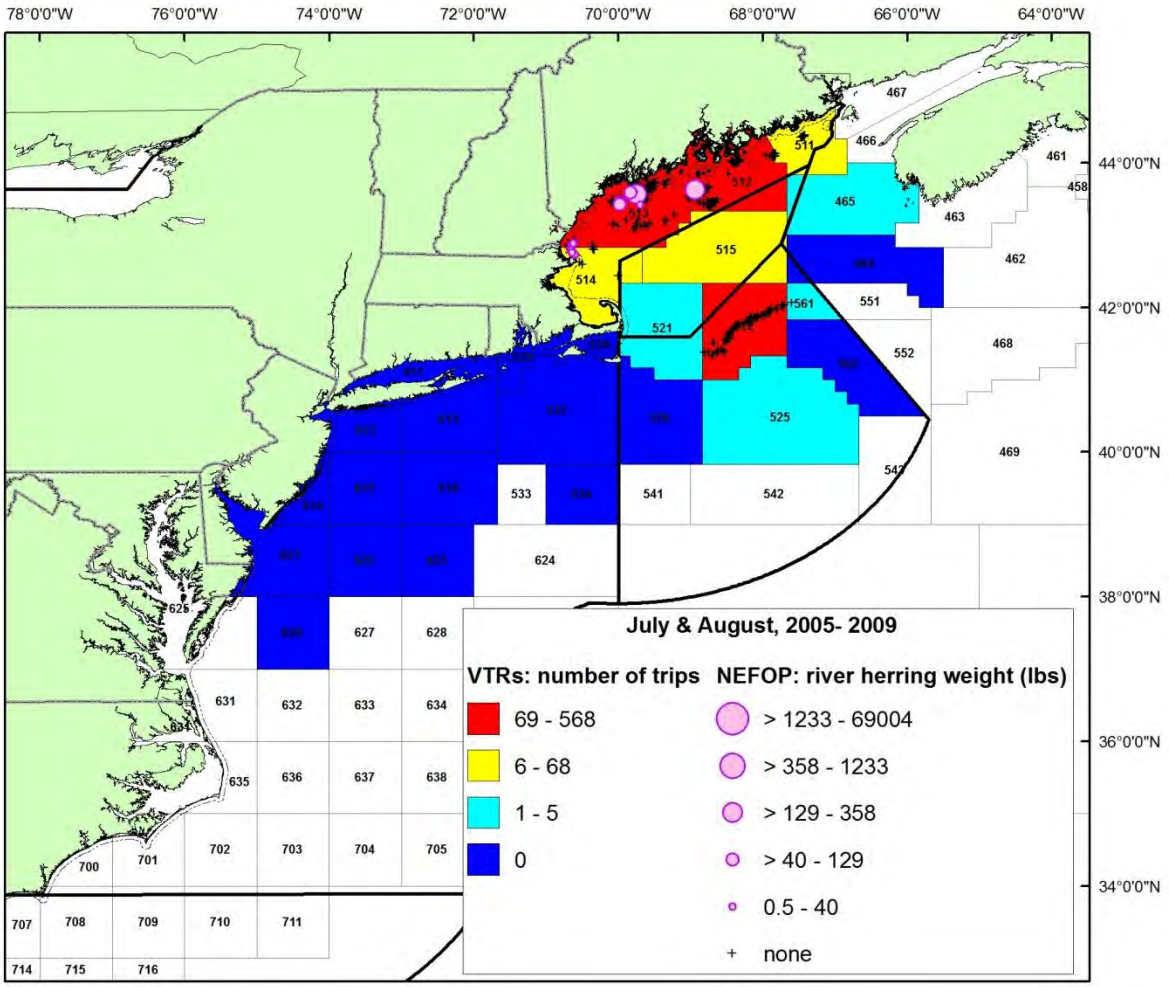


Figure A4: Reported trips (VTR) and observed hauls and sets (NEFOP) during July and August, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-568 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

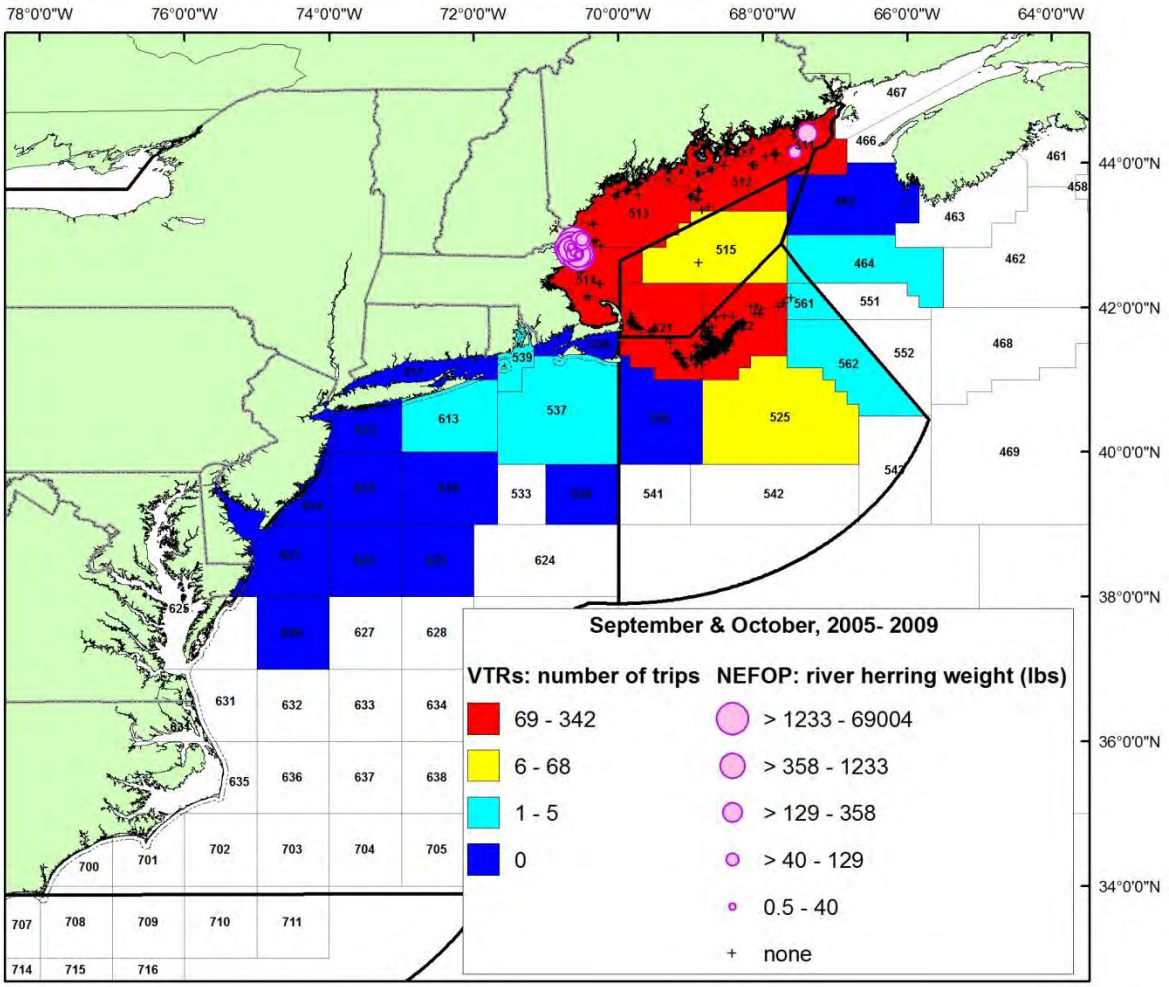


Figure A5: Reported trips (VTR) and observed hauls and sets (NEFOP) during September and October, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-342 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

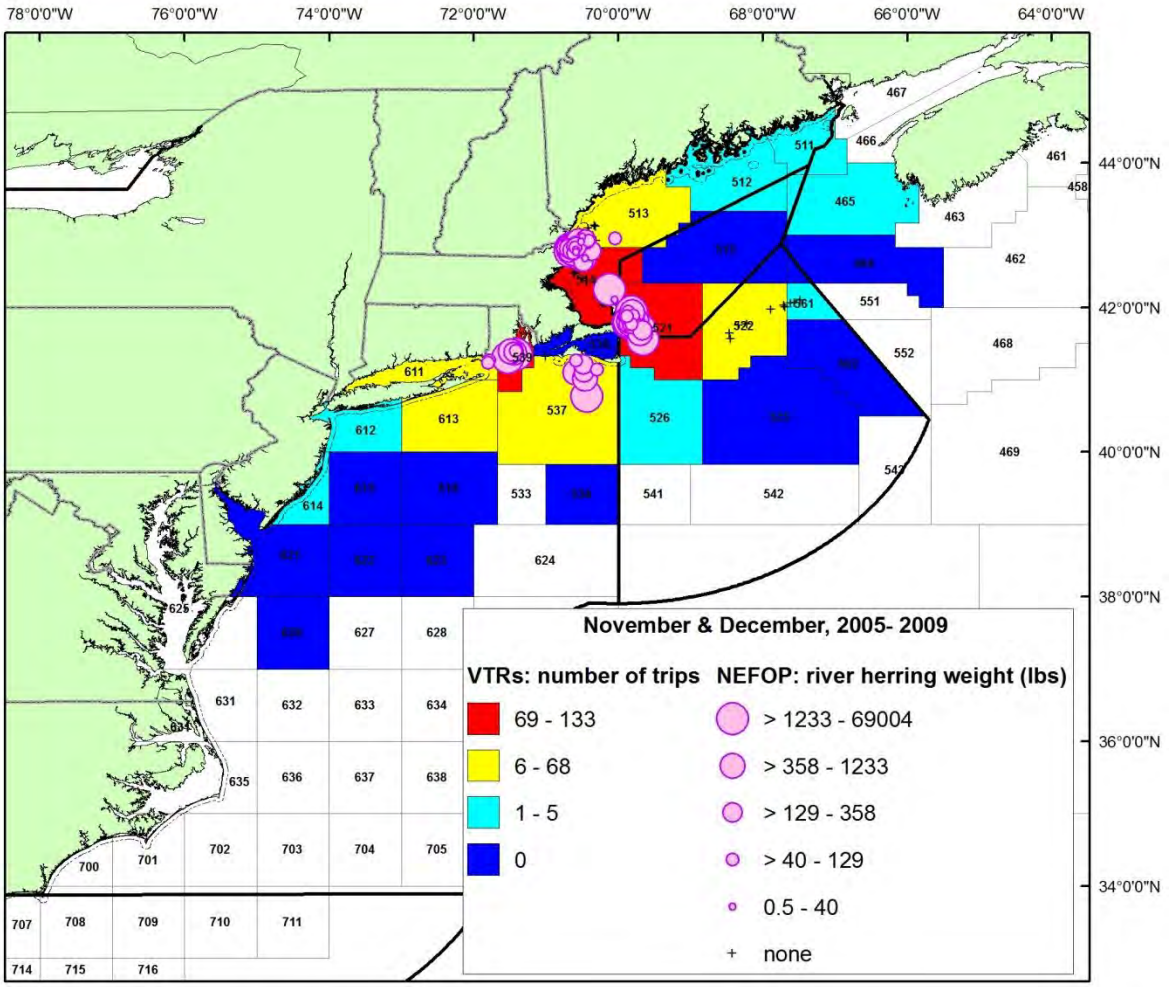


Figure A6: Reported trips (VTR) and observed hauls and sets (NEFOP) during November and December, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-133 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Sources: VTR Database 2005-2009 and NEFOP Database 2005-2009.

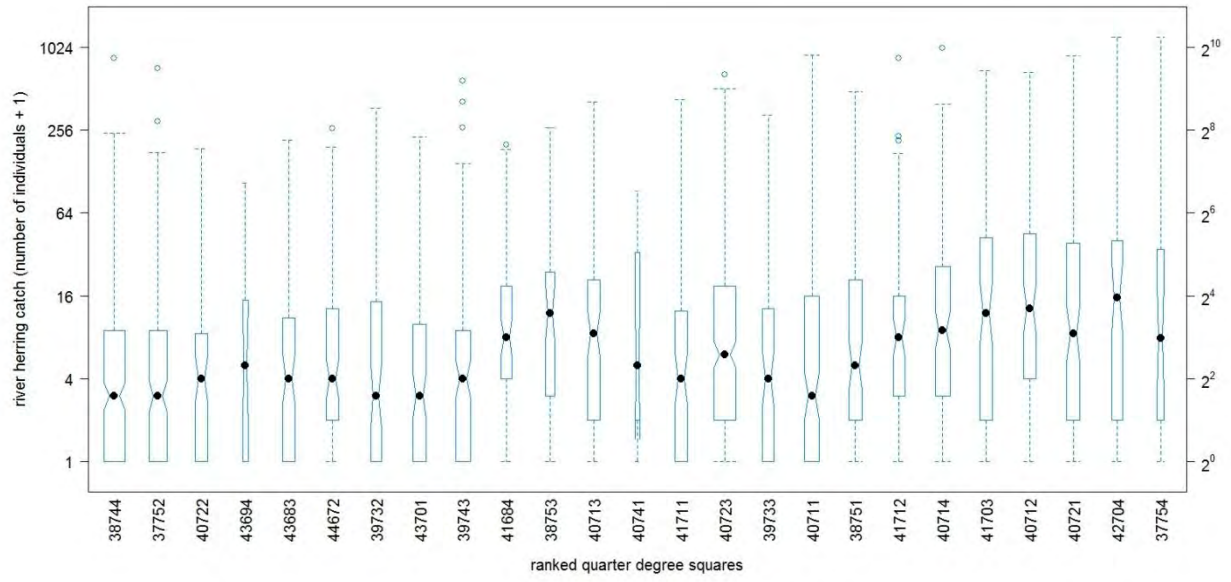


Figure A7: Spring quarter degree squares ranked by mean river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

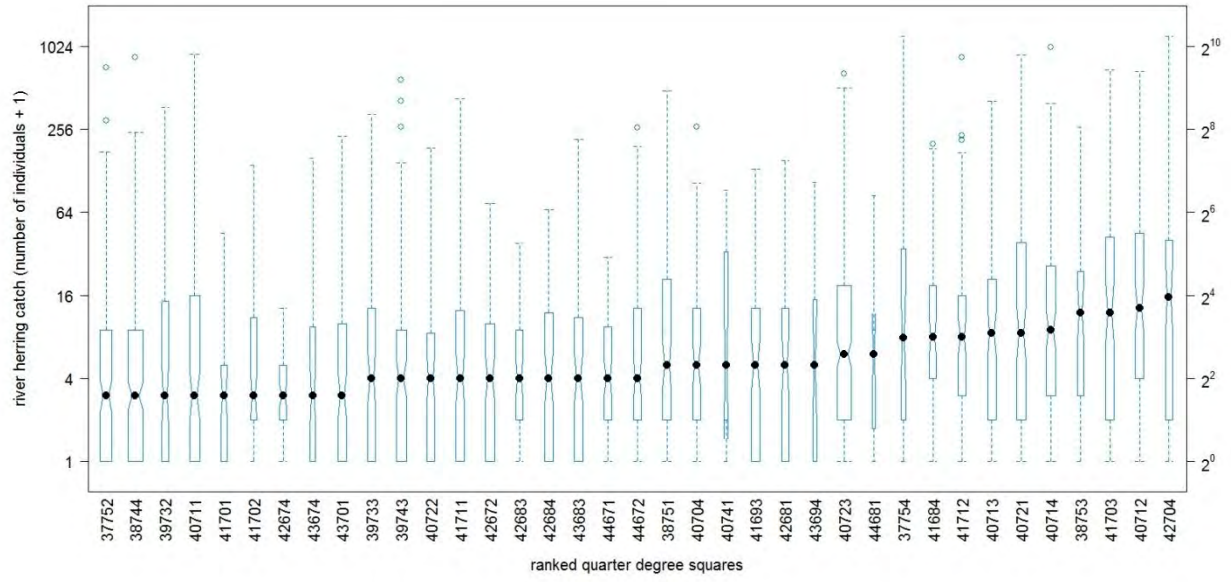


Figure A8: Spring quarter degree squares ranked by median river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

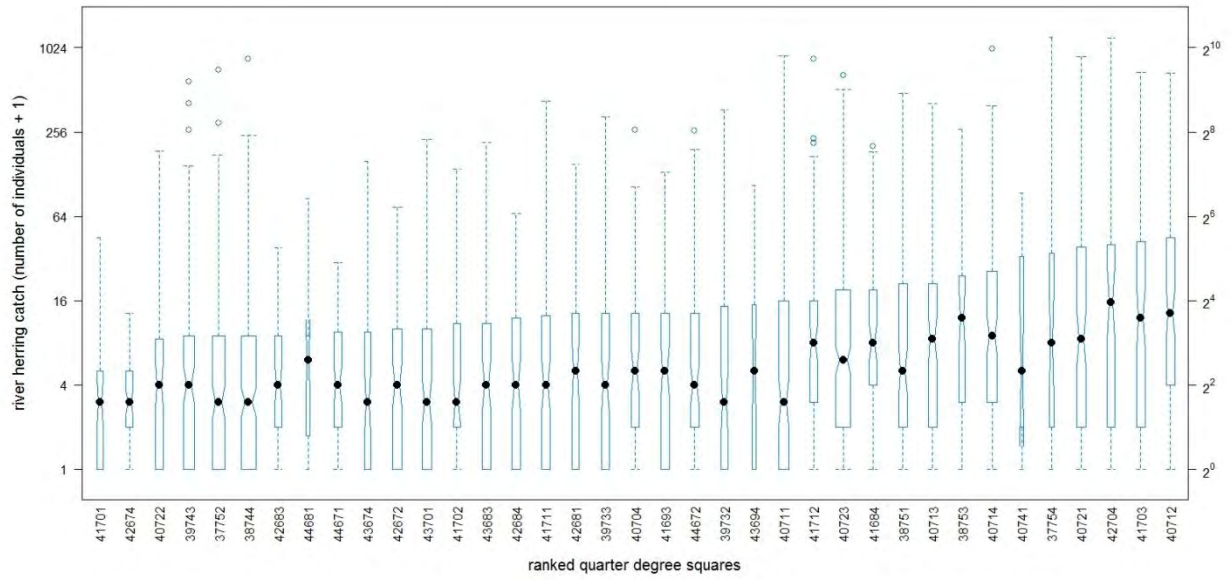


Figure A9: Spring quarter degree squares ranked by 75th quantile of river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

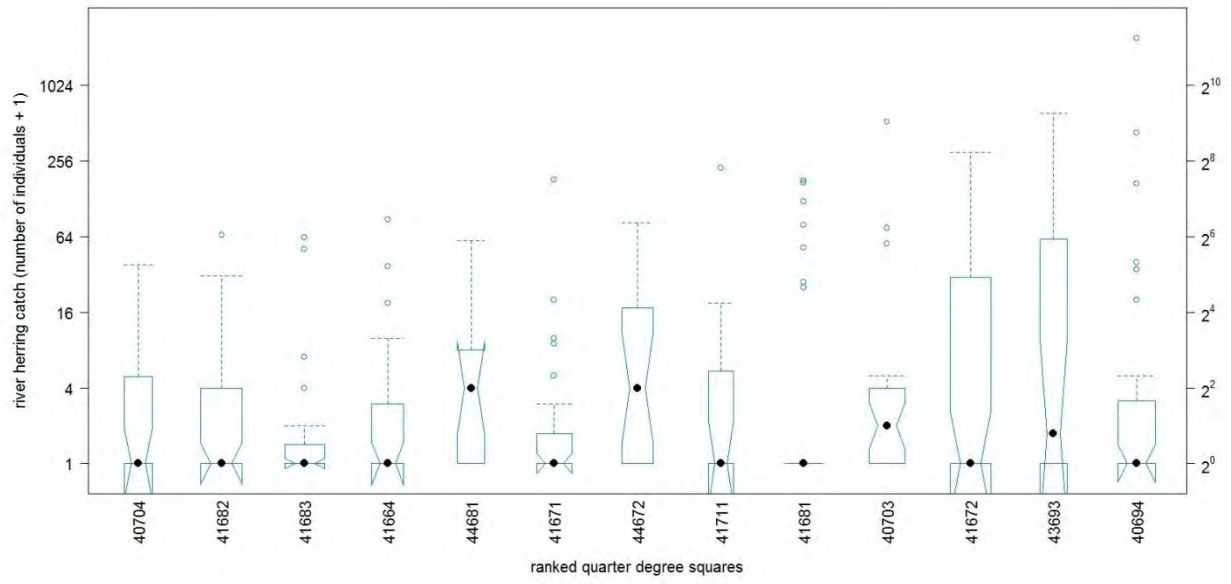


Figure A10: Summer quarter degree squares ranked by mean river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

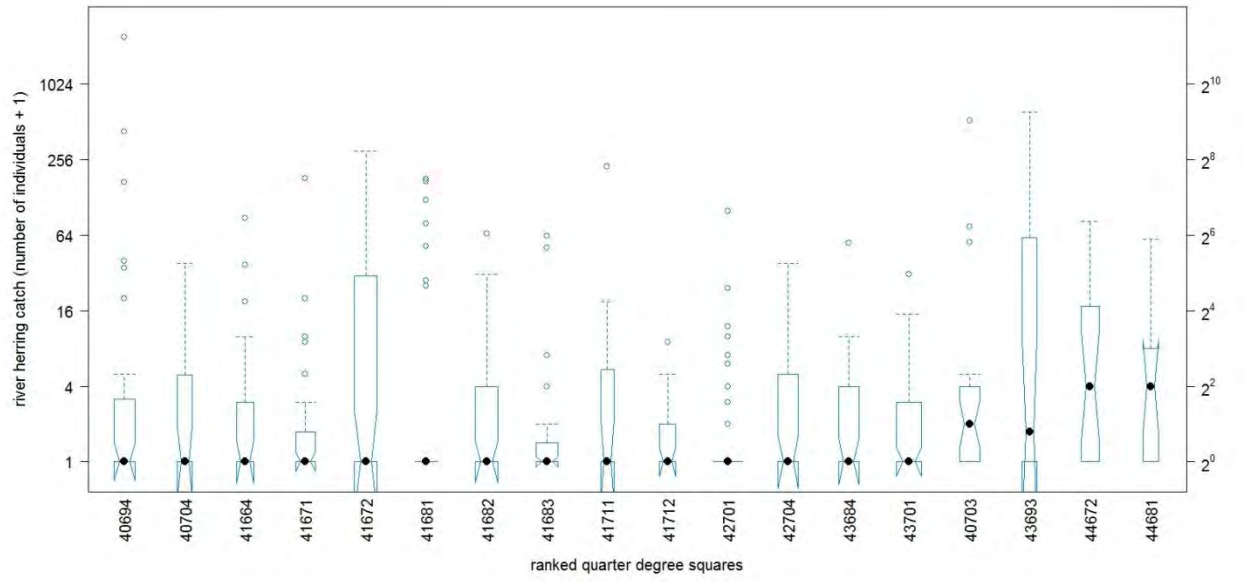


Figure A11: Summer quarter degree squares ranked by median river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

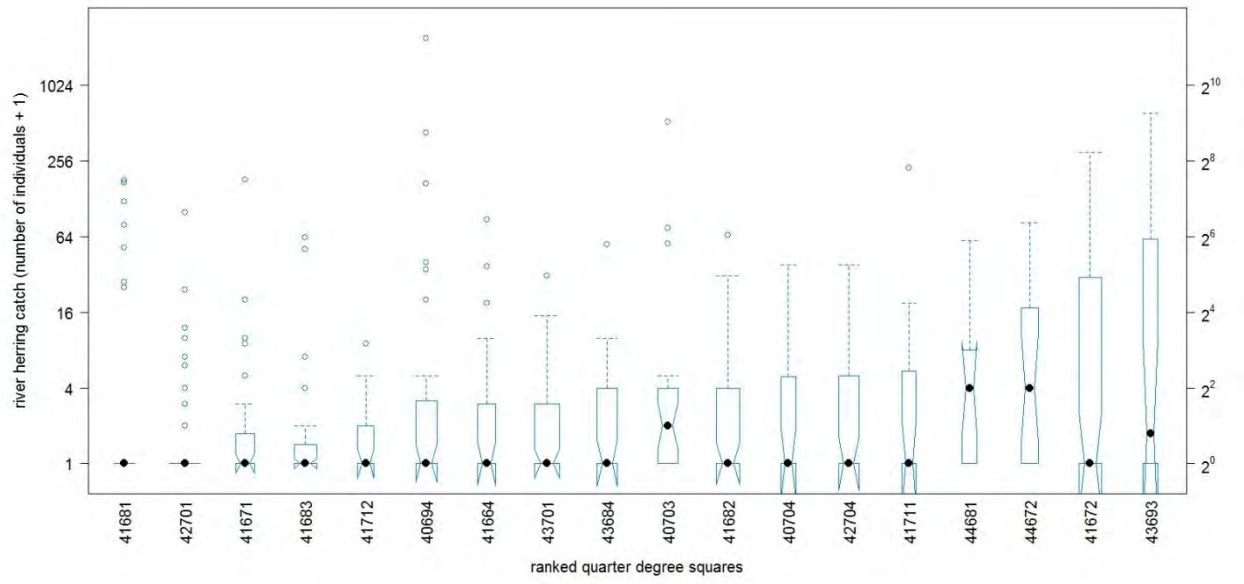


Figure A12: Summer quarter degree squares ranked by 75th quantile of river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

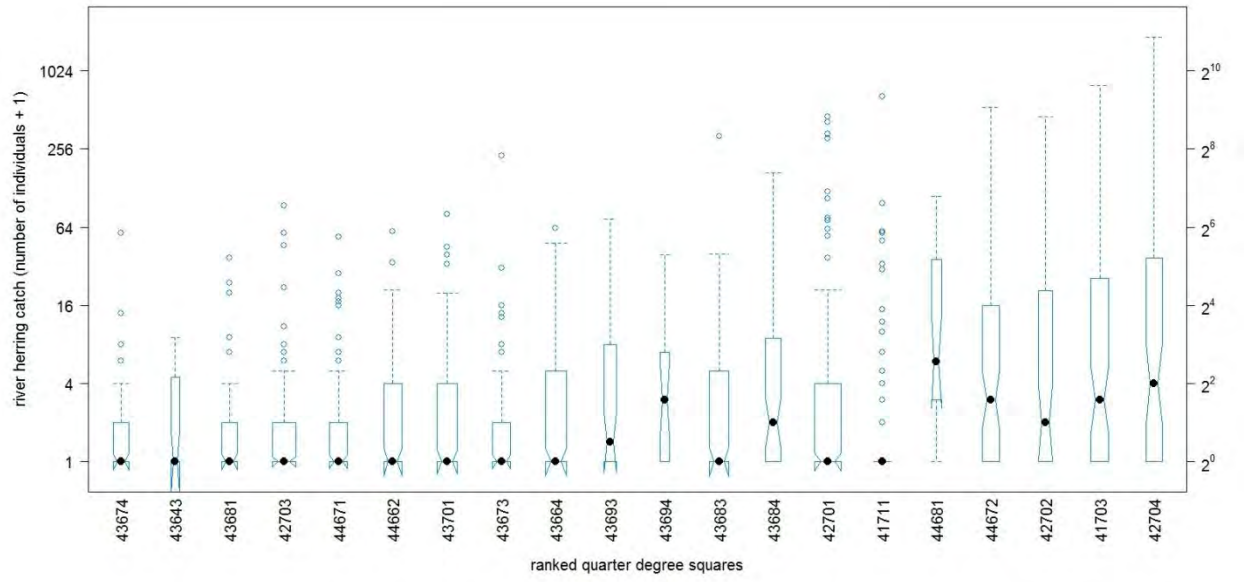


Figure A13: Fall quarter degree squares ranked by mean river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

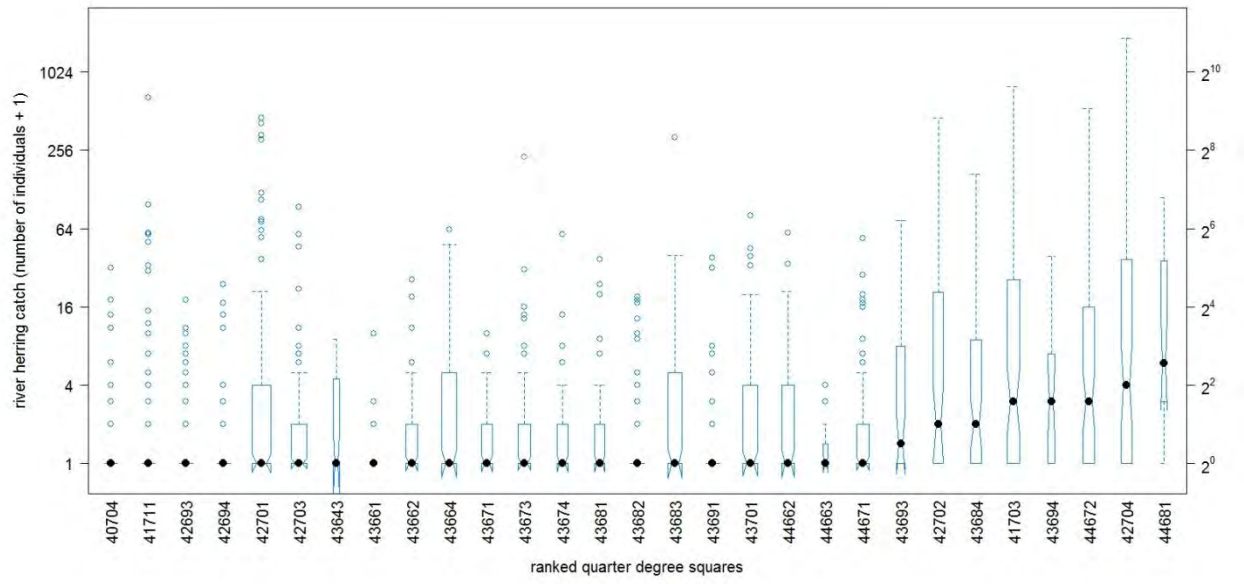


Figure A14: Fall quarter degree squares ranked by median river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

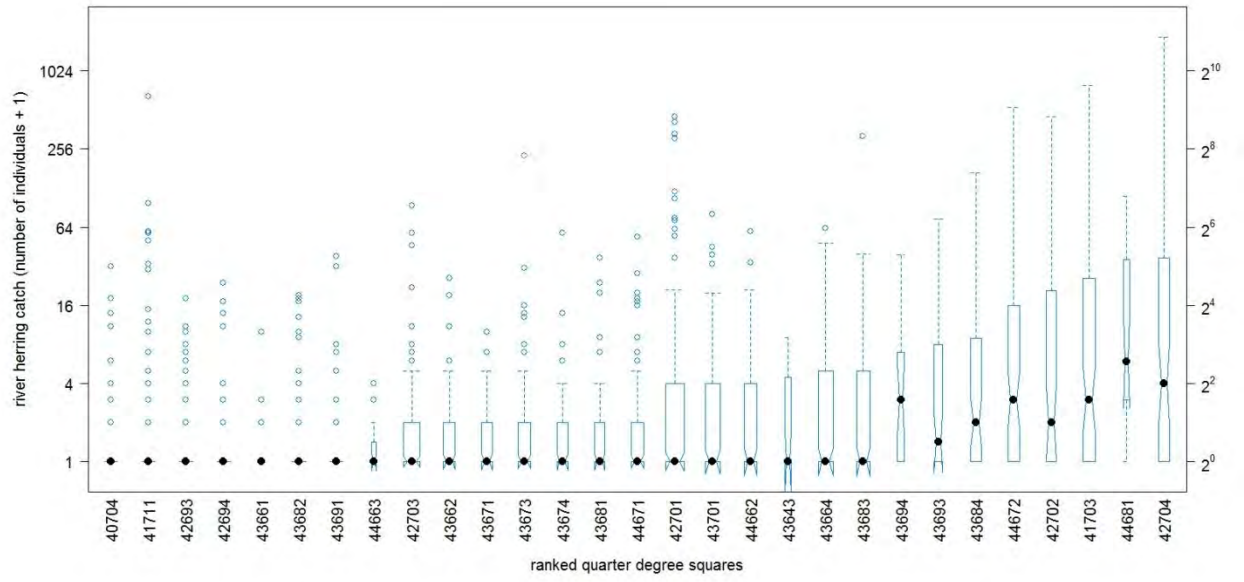


Figure A15: Fall quarter degree squares ranked by 75th quantile of river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

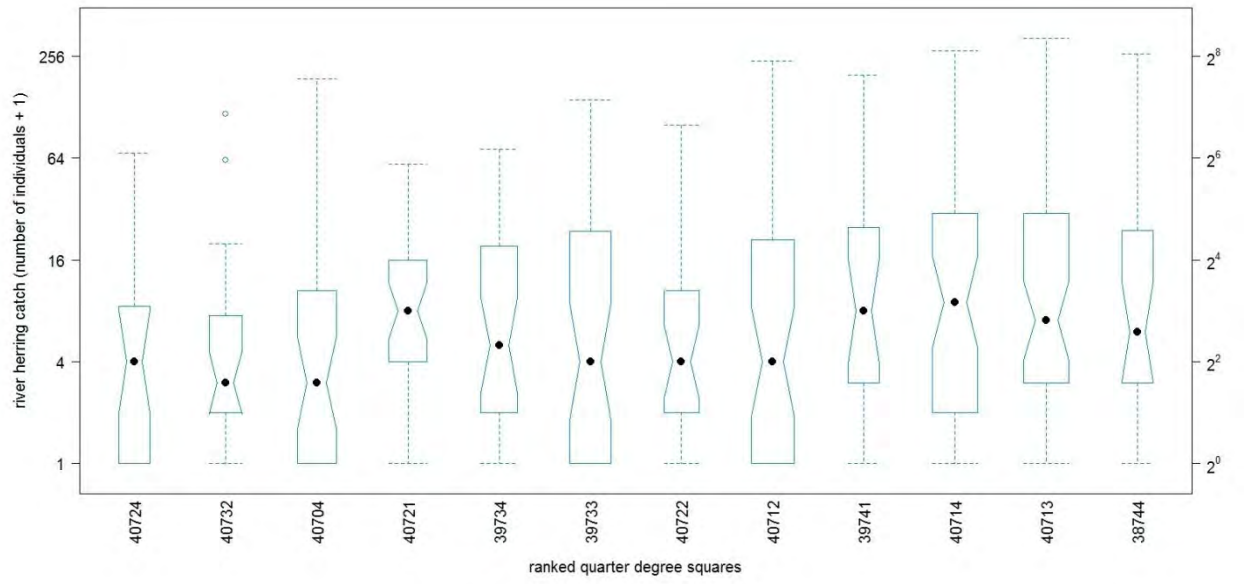


Figure A16: Winter quarter degree squares ranked by mean river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

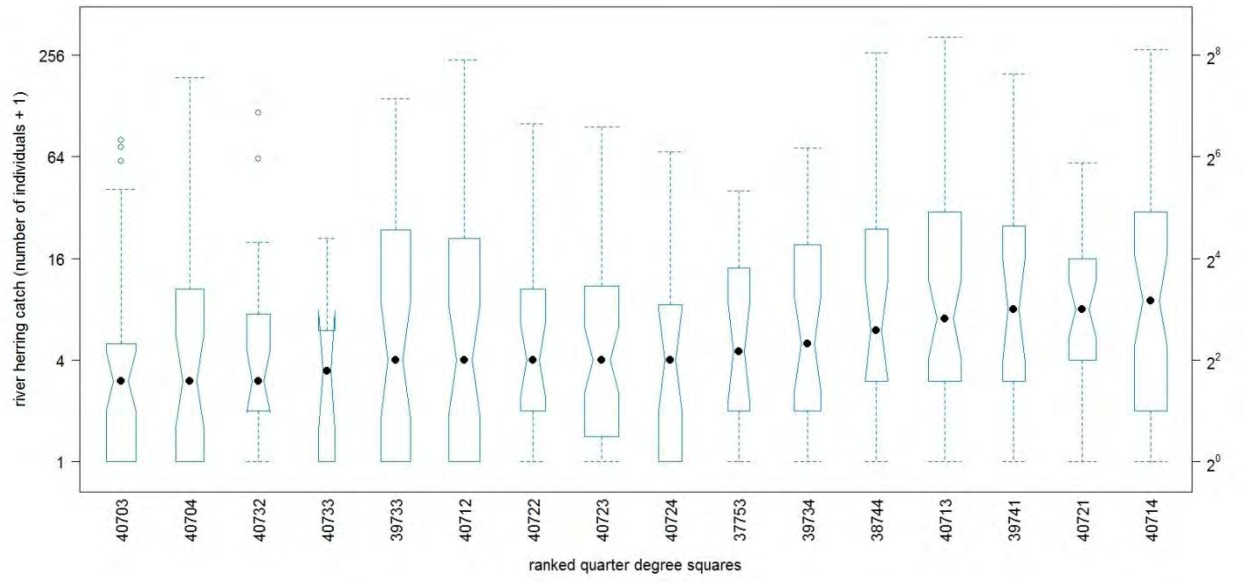


Figure A17: Winter quarter degree squares ranked by median river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

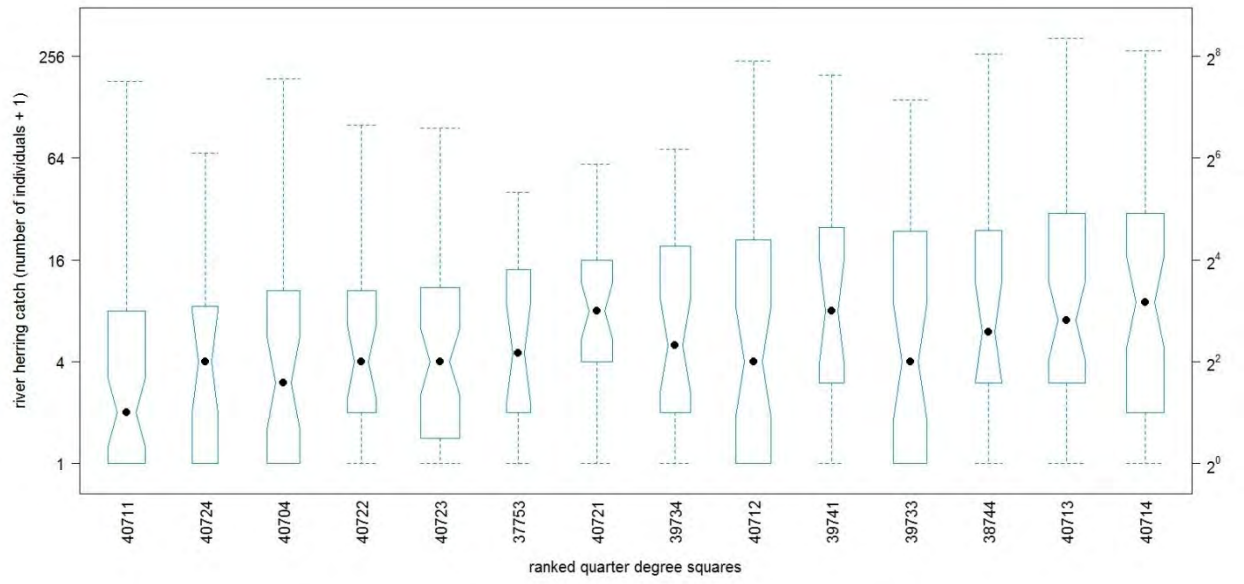


Figure A18: Winter quarter degree squares ranked by 75th quantile of river herring catch (number of individuals +1). Note the logarithmic scale on the y-axis. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

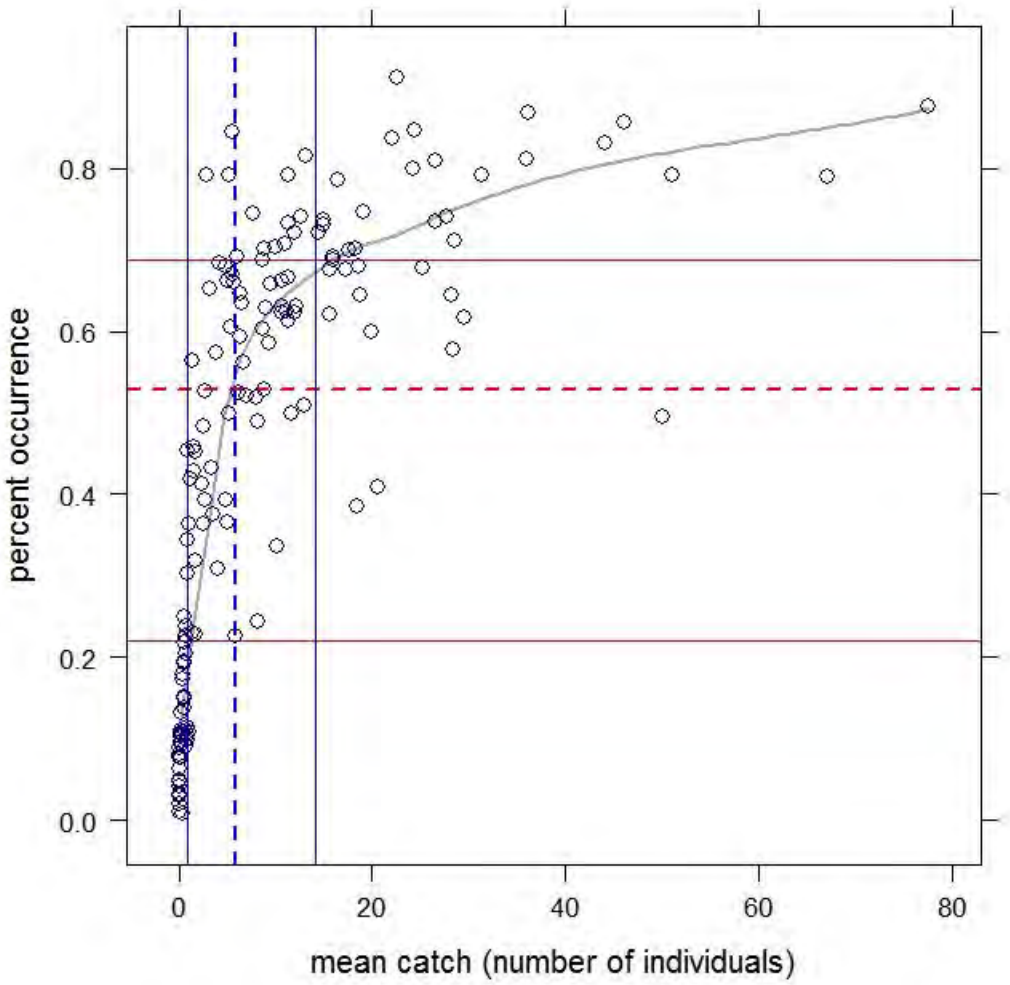


Figure A19: Spring percent occurrence against mean catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=mean catch in number. Dashed lines are medians (red=percent occurrence, blue=mean catch in number. Hot spots are defined as squares having percent occurrence and mean catch in number ≥ 75th quantiles for each variable. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

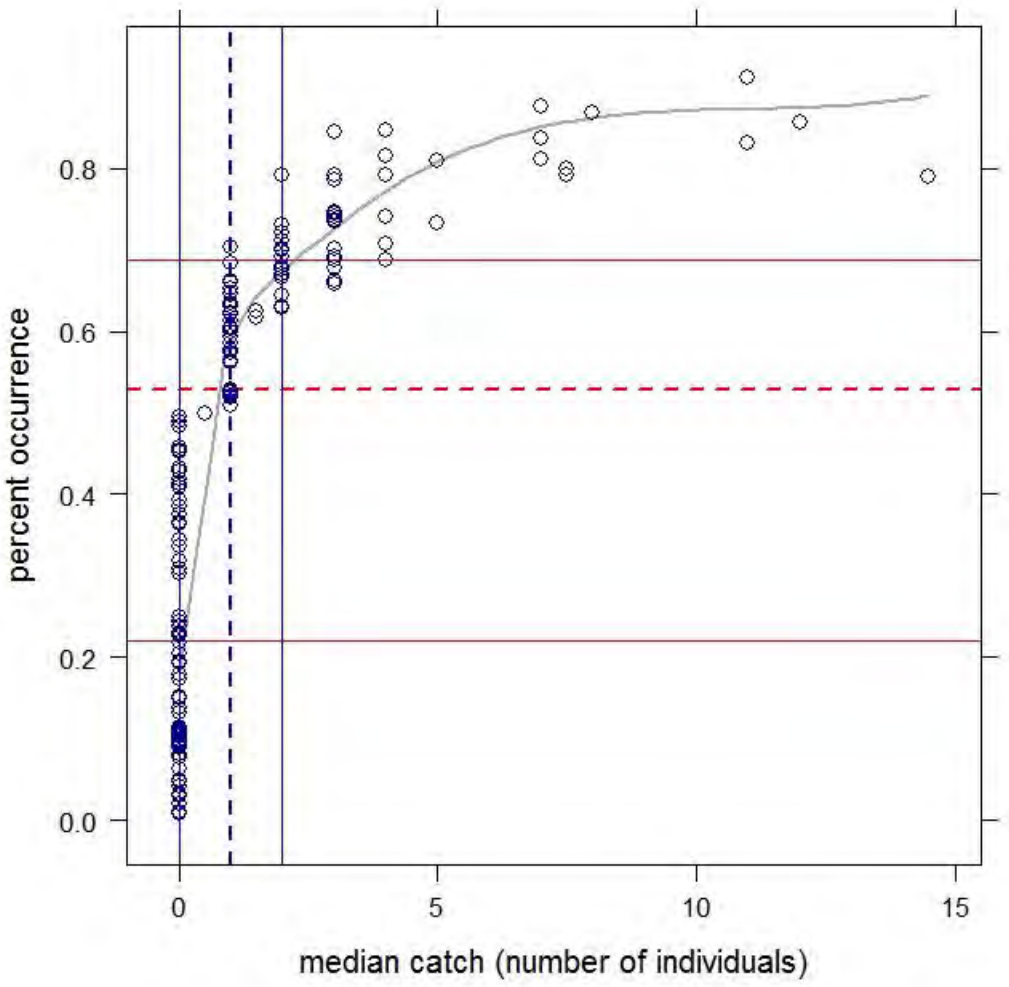


Figure A20: Spring percent occurrence against median catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=median catch in number. Dashed lines are medians (red=percent occurrence, blue=median catch in number. Hot spots are defined as squares having percent occurrence and median catch in number ≥ 75th quantiles for each variable. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

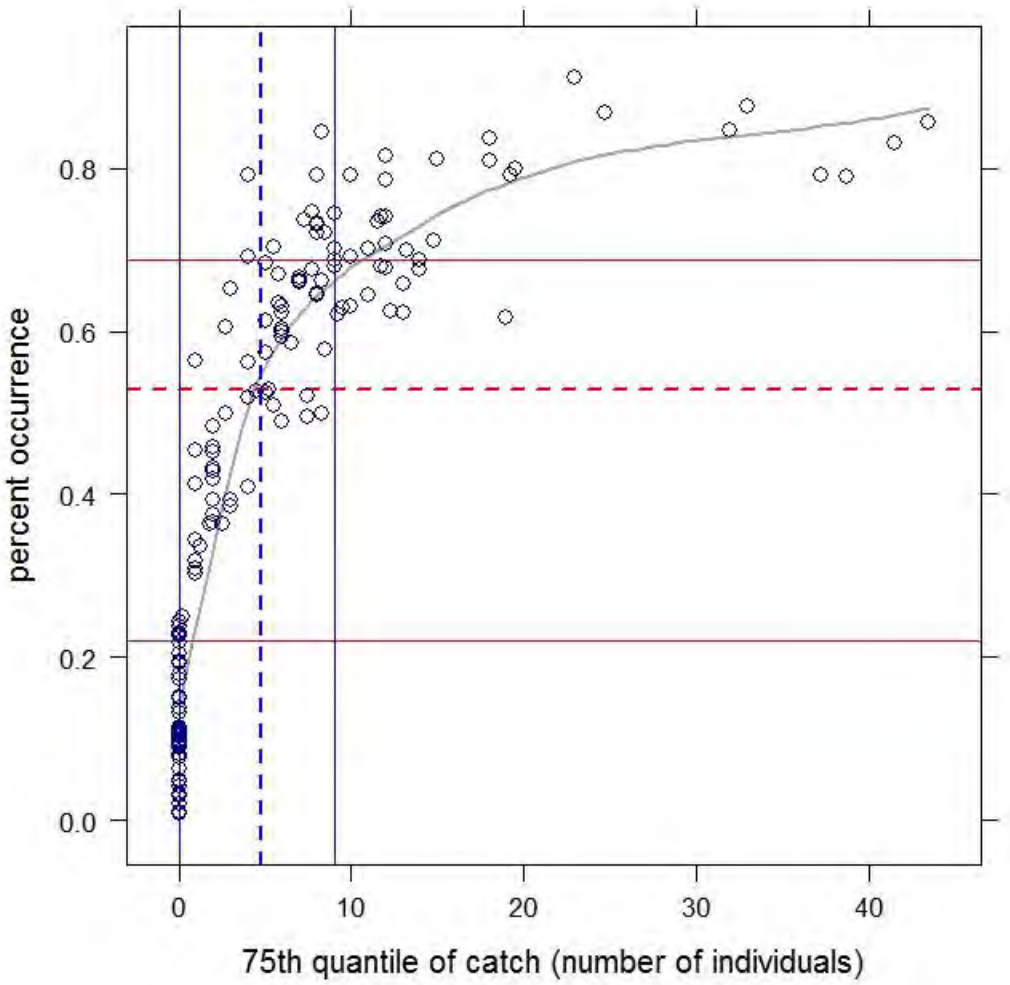


Figure A21: Spring percent occurrence against 75th quantile of catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=75th quantile of catch in number. Dashed lines are medians (red=percent occurrence, blue=75th quantile of catch in number. Hot spots are defined as squares having percent occurrence and 75th quantile of catch in number ≥ 75th quantiles for each variable. Source: Spring 1968-2008 NMFS bottom-trawl surveys.

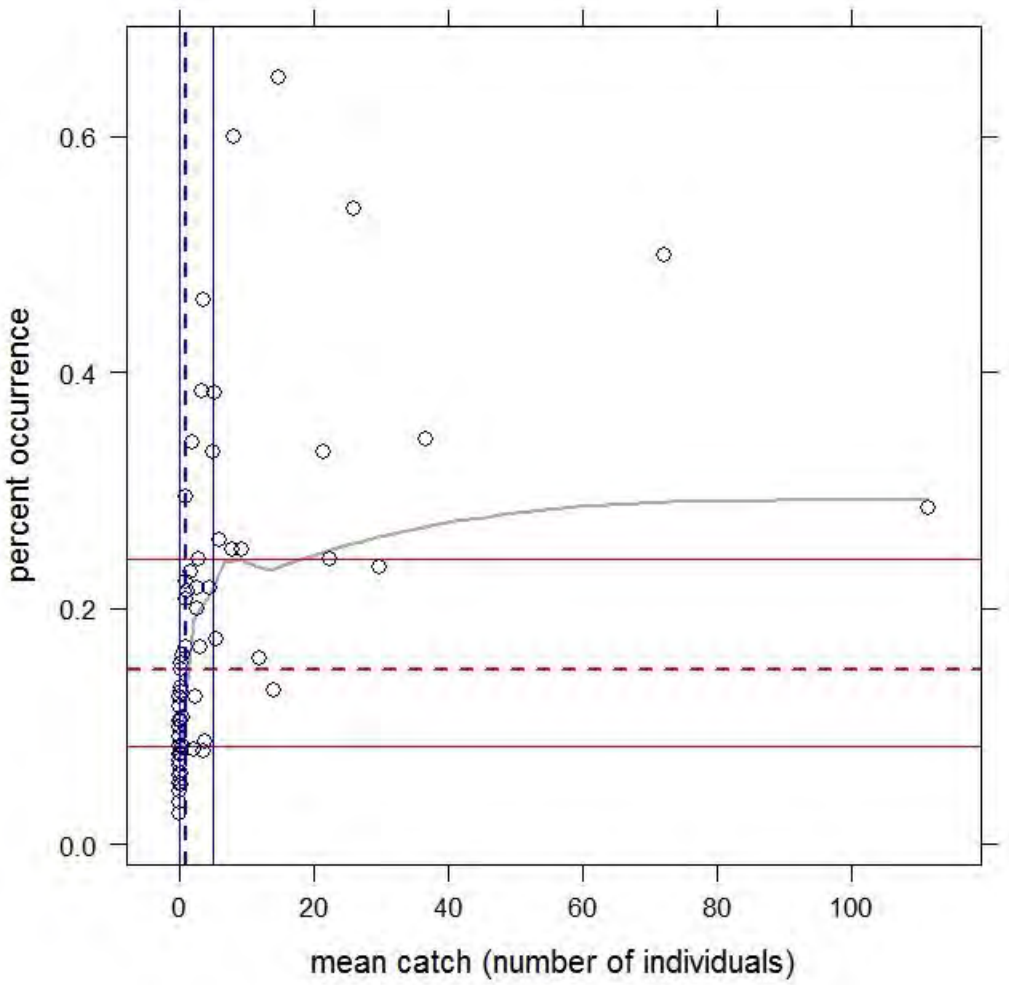


Figure A22: Summer percent occurrence against mean catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=mean catch in number. Dashed lines are medians (red=percent occurrence, blue=mean catch in number. Hot spots are defined as squares having percent occurrence and mean catch in number ≥ 75th quantiles for each variable. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

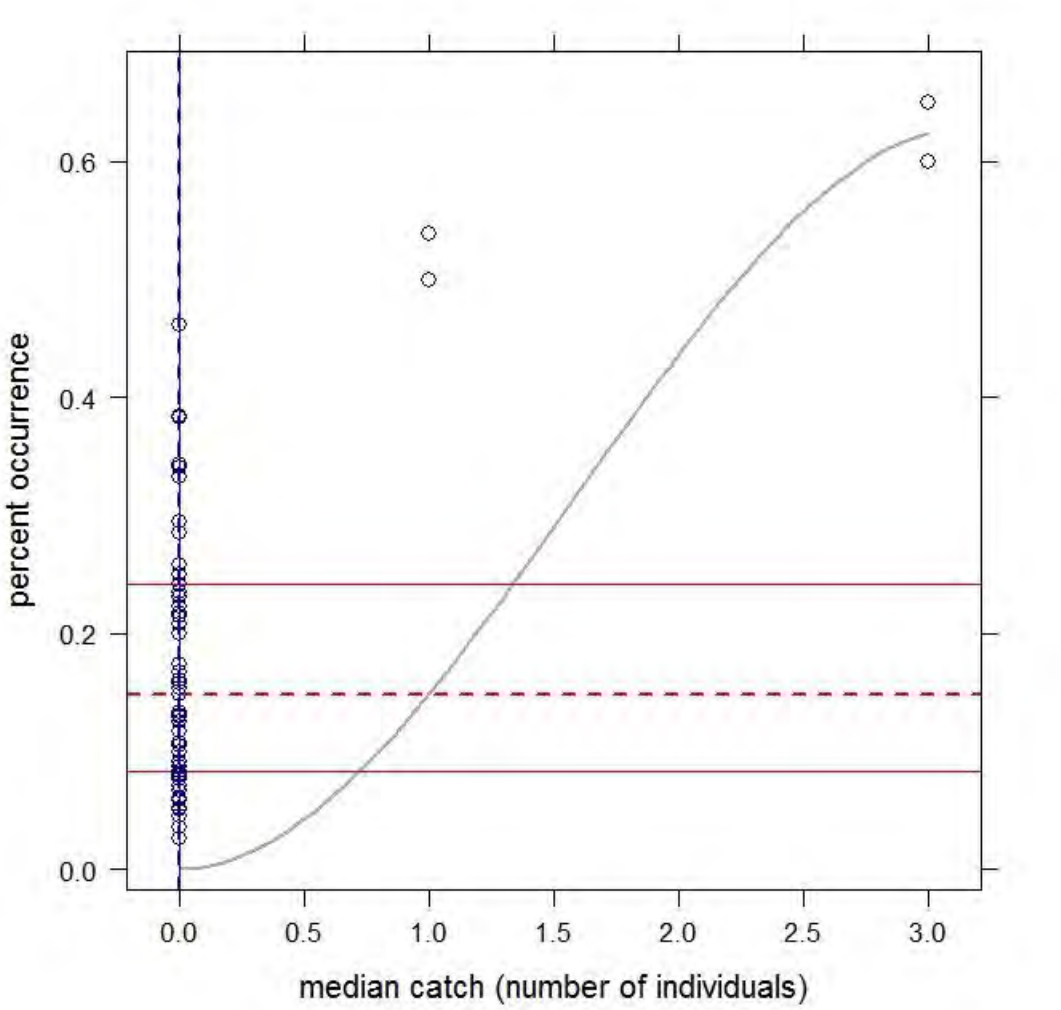


Figure A23: Summer percent occurrence against median catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=median catch in number. Dashed lines are medians (red=percent occurrence, blue=median catch in number. Hot spots are defined as squares having percent occurrence and median catch in number ≥ 75th quantiles for each variable. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

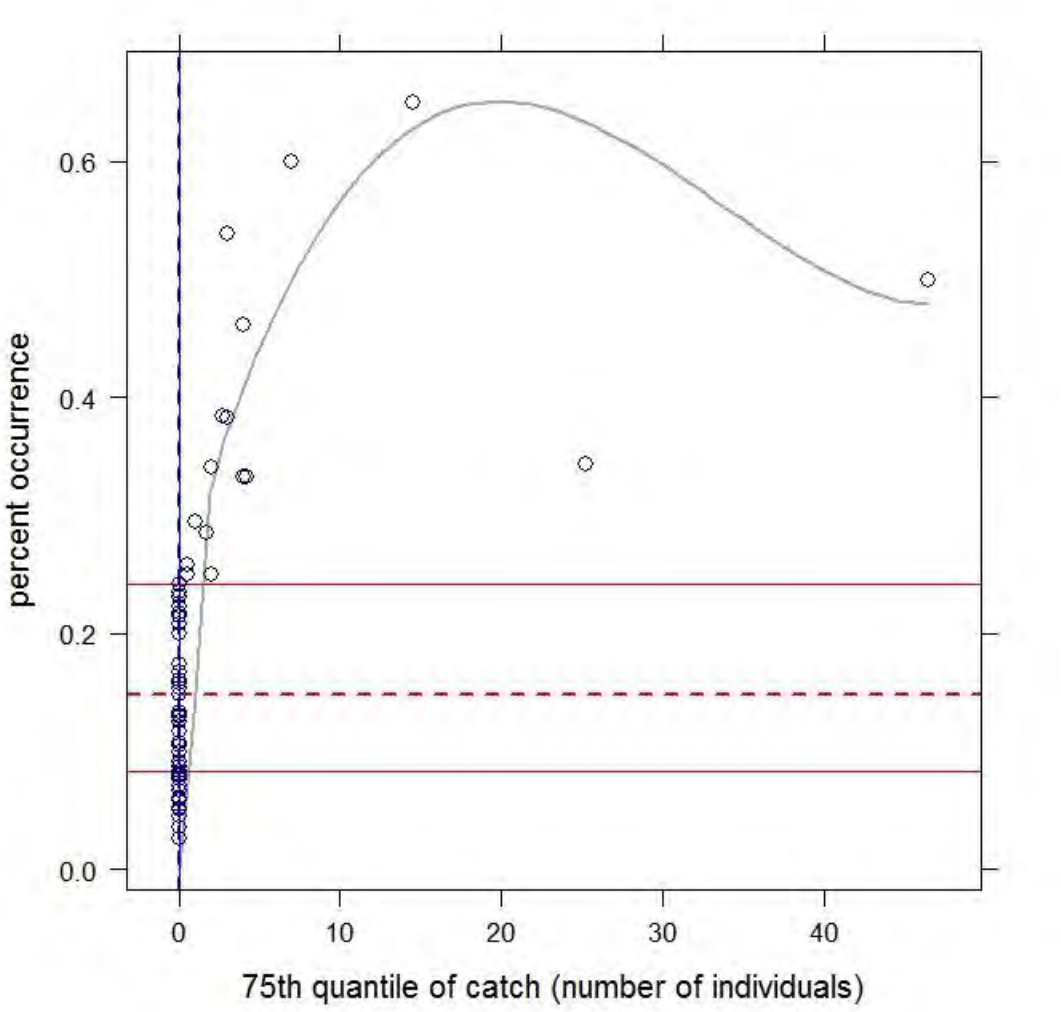


Figure A24: Summer percent occurrence against 75th quantile of catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=75th quantile of catch in number. Dashed lines are medians (red=percent occurrence, blue=75th quantile of catch in number. Hot spots are defined as squares having percent occurrence and 75th quantile of catch in number ≥ 75th quantiles for each variable. Source: Summer 1948-1995 NMFS bottom-trawl surveys.

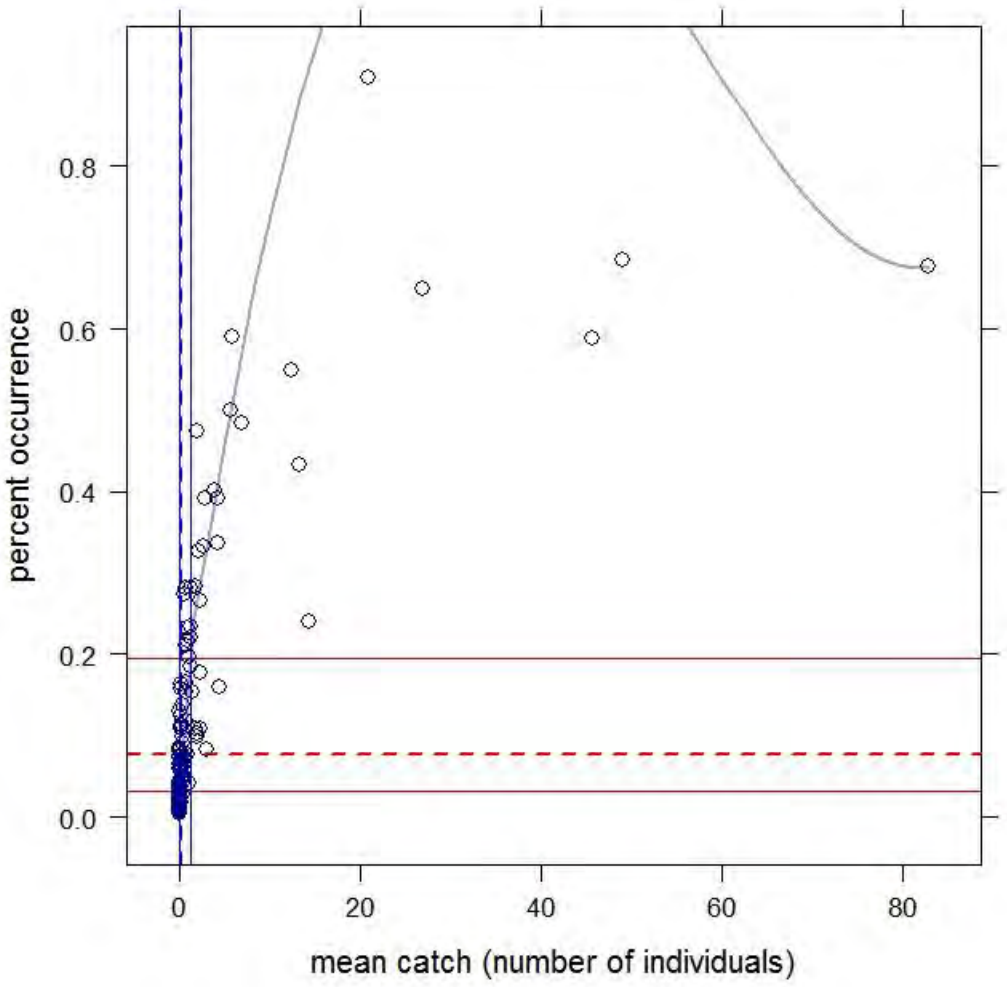


Figure A25: Fall percent occurrence against mean catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=mean catch in number. Dashed lines are medians (red=percent occurrence, blue=mean catch in number. Hot spots are defined as squares having percent occurrence and mean catch in number ≥ 75th quantiles for each variable. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

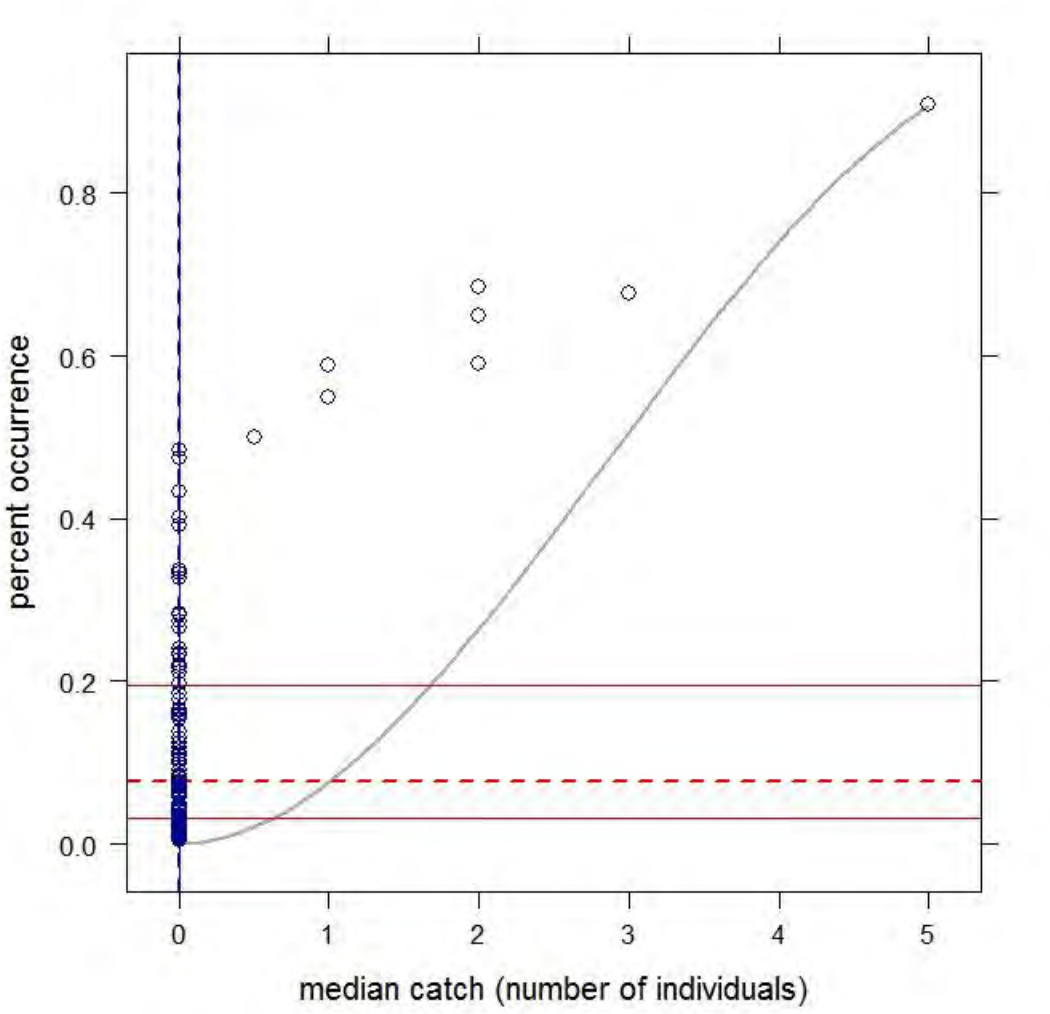


Figure A26: Fall percent occurrence against median catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=median catch in number. Dashed lines are medians (red=percent occurrence, blue=median catch in number. Hot spots are defined as squares having percent occurrence and median catch in number ≥ 75th quantiles for each variable. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

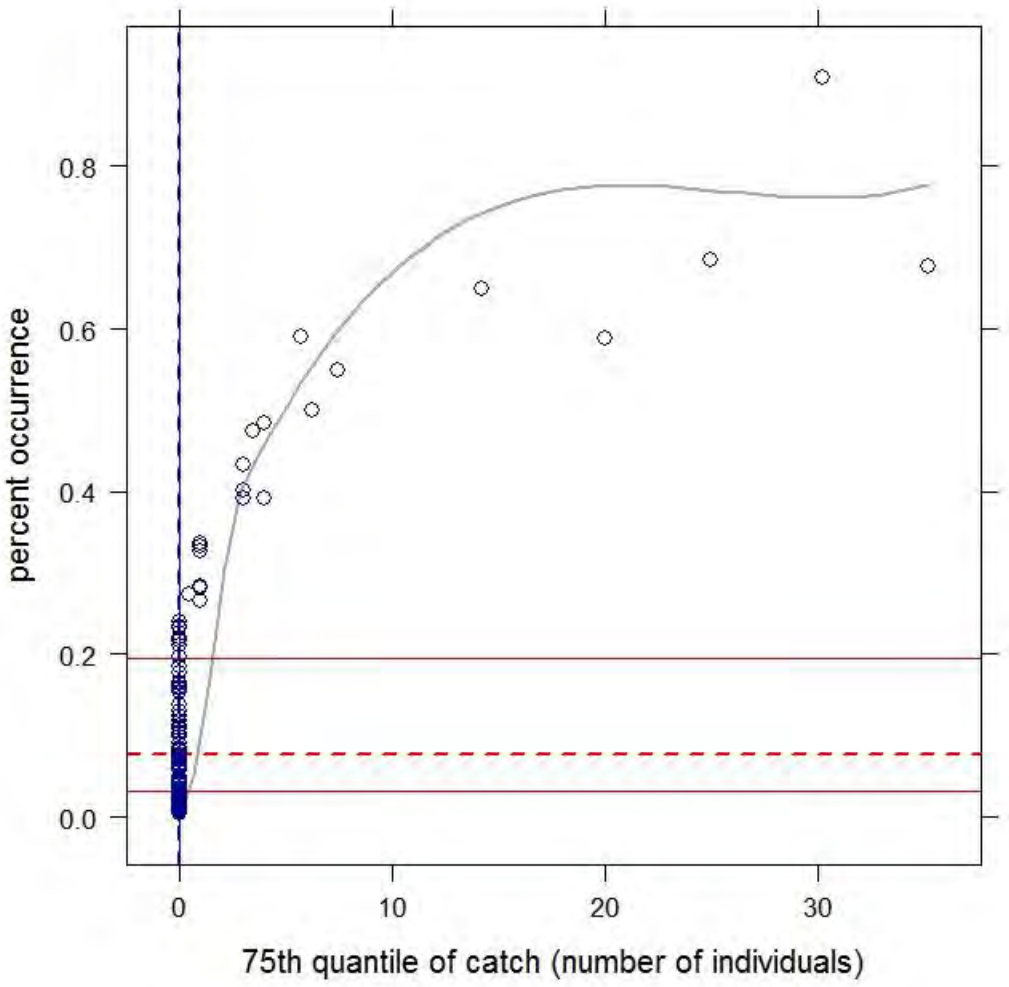


Figure A27: Fall percent occurrence against 75th quantile of catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=75th quantile of catch in number. Dashed lines are medians (red=percent occurrence, blue=75th quantile of catch in number. Hot spots are defined as squares having percent occurrence and 75th quantile of catch in number ≥ 75th quantiles for each variable. Source: Fall 1963-2008 NMFS bottom-trawl surveys.

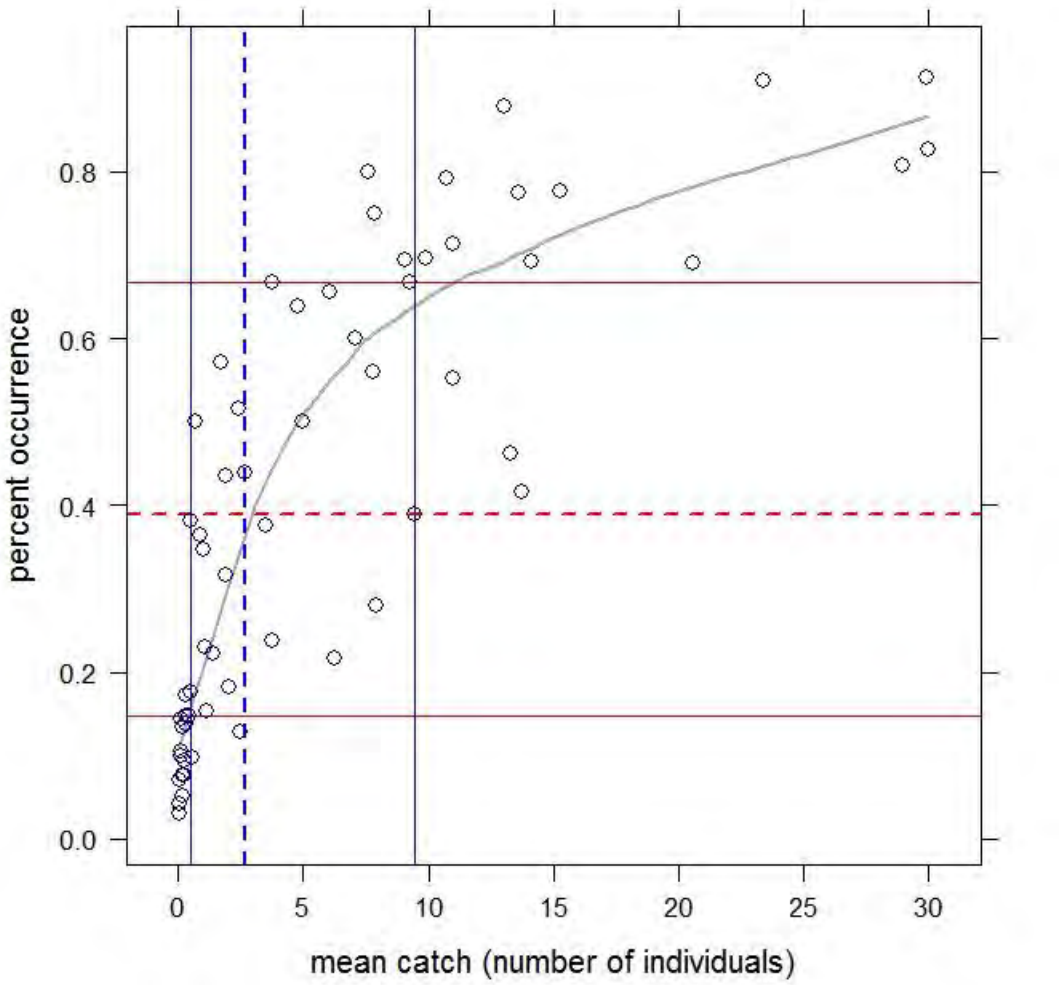


Figure A28: Winter percent occurrence against mean catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=mean catch in number. Dashed lines are medians (red=percent occurrence, blue=mean catch in number. Hot spots are defined as squares having percent occurrence and mean catch in number ≥ 75th quantiles for each variable. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

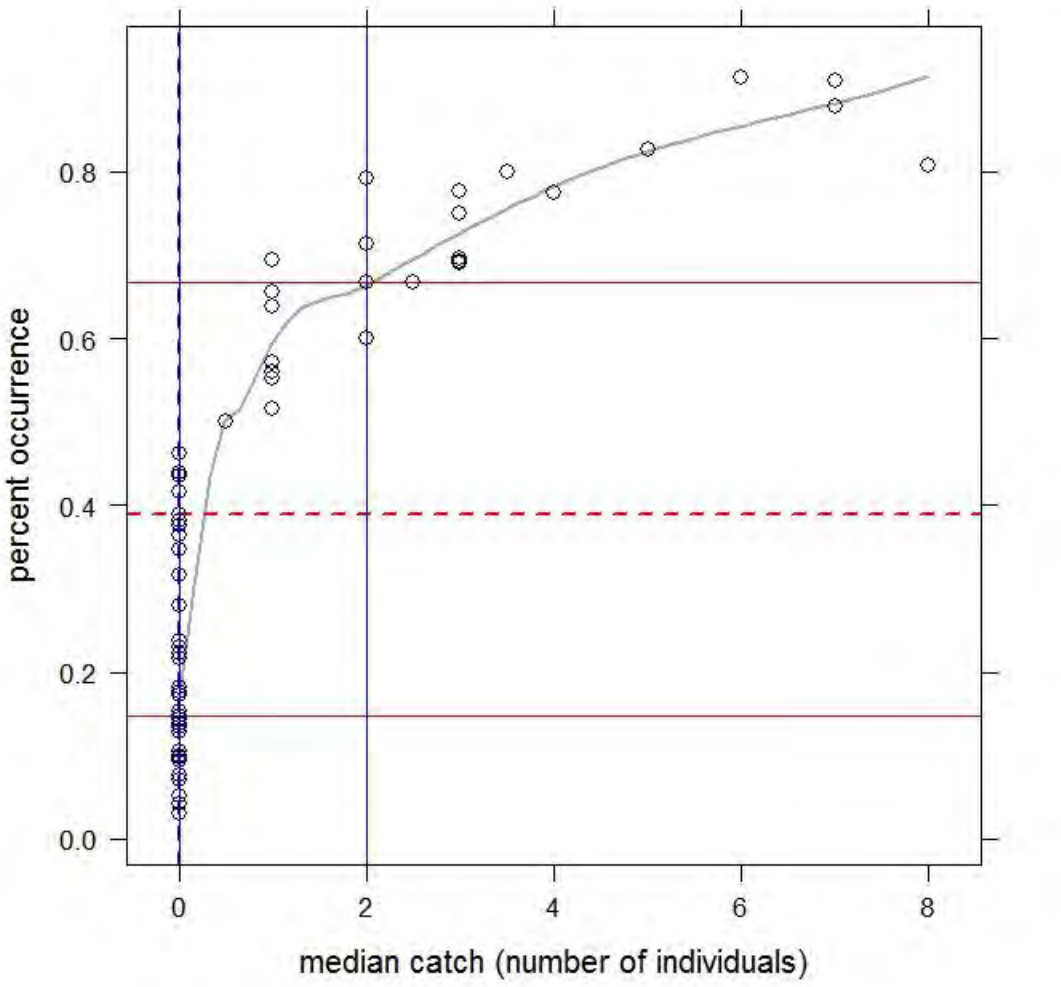


Figure A29: Winter percent occurrence against median catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=median catch in number. Dashed lines are medians (red=percent occurrence, blue=median catch in number. Hot spots are defined as squares having percent occurrence and median catch in number ≥ 75th quantiles for each variable. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

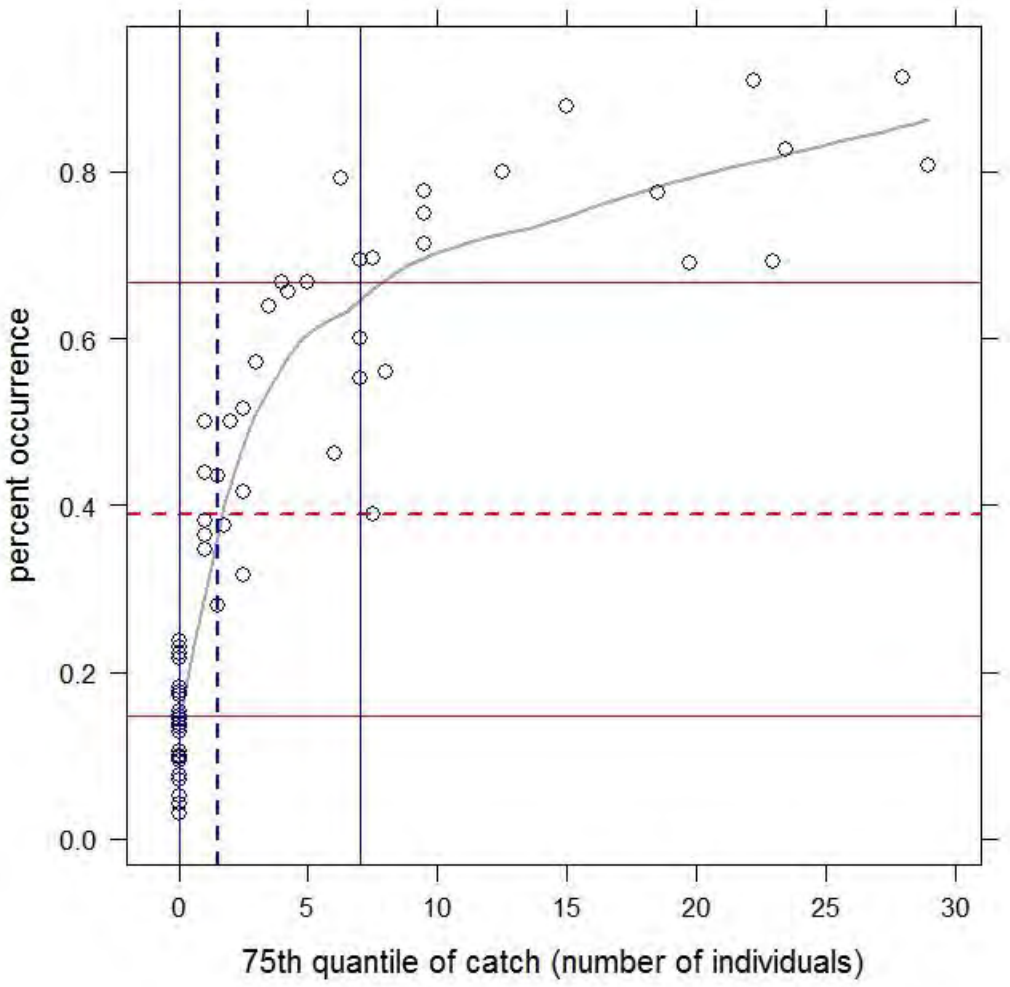


Figure A30: Winter percent occurrence against 75th quantile of catch in number for quarter degree square (dark blue circles). Solid lines are 25th and 75th quantiles (red=percent occurrence, blue=75th quantile of catch in number. Dashed lines are medians (red=percent occurrence, blue=75th quantile of catch in number. Hot spots are defined as squares having percent occurrence and 75th quantile of catch in number ≥ 75th quantiles for each variable. Source: Winter 1964-2007 NMFS bottom-trawl surveys.

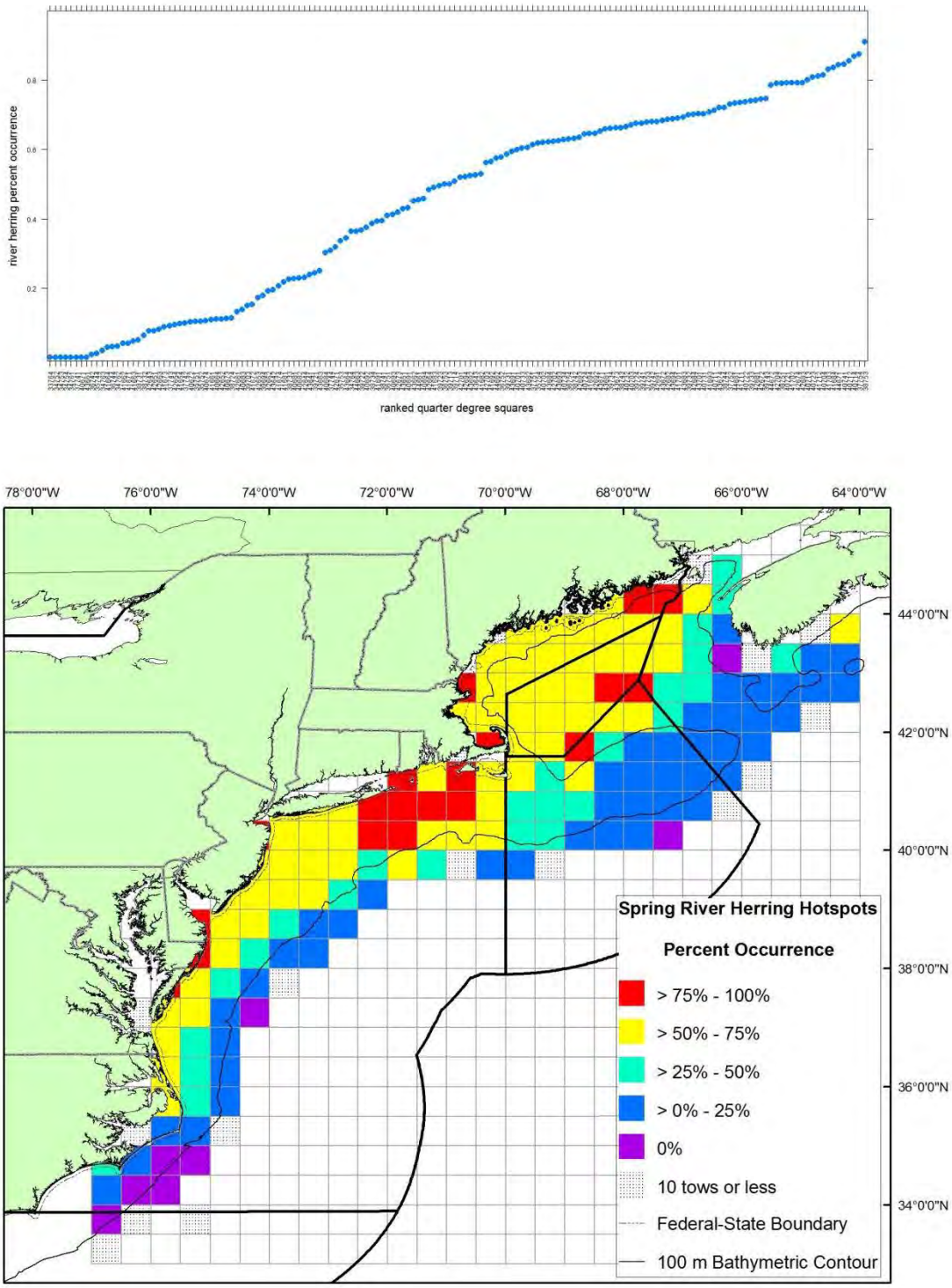


Figure A31: Percent occurrence of river herring in spring research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by quarter degree squares grouped from > 75% - 100% (red), > 50% - 75% (yellow), > 25% - 50% (aqua), > 0 - 25% (blue) and 0% (purple) (bottom). Source: Spring 1968-2008 NMFS bottom-trawl surveys.

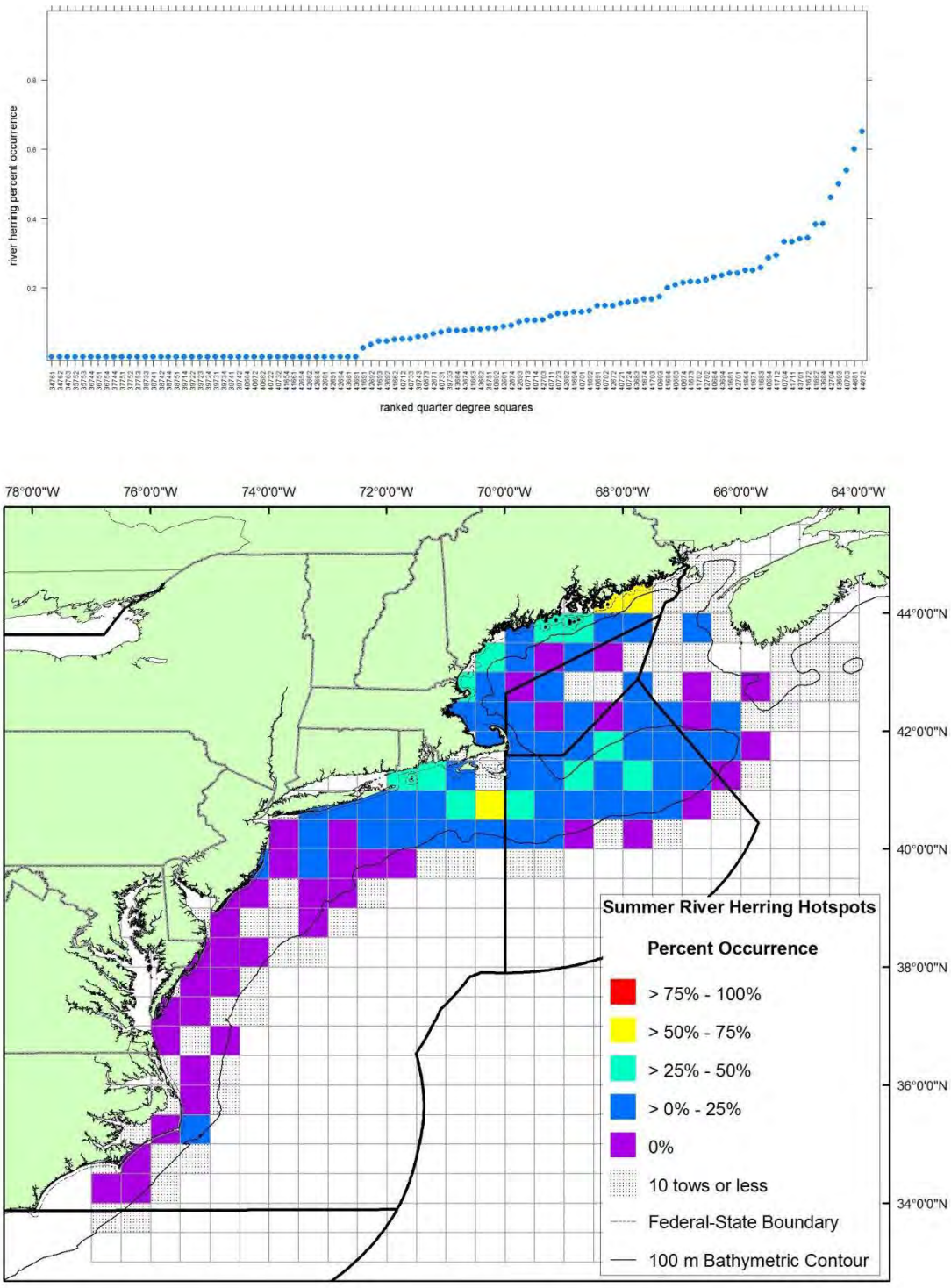


Figure A32: Percent occurrence of river herring in summer research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by quarter degree squares grouped from > 75% - 100% (red), > 50% - 75% (yellow), > 25% - 50% (aqua), > 0 - 25% (blue) and 0% (purple) (bottom). Source: Summer 1948-1995 NMFS bottom-trawl surveys.

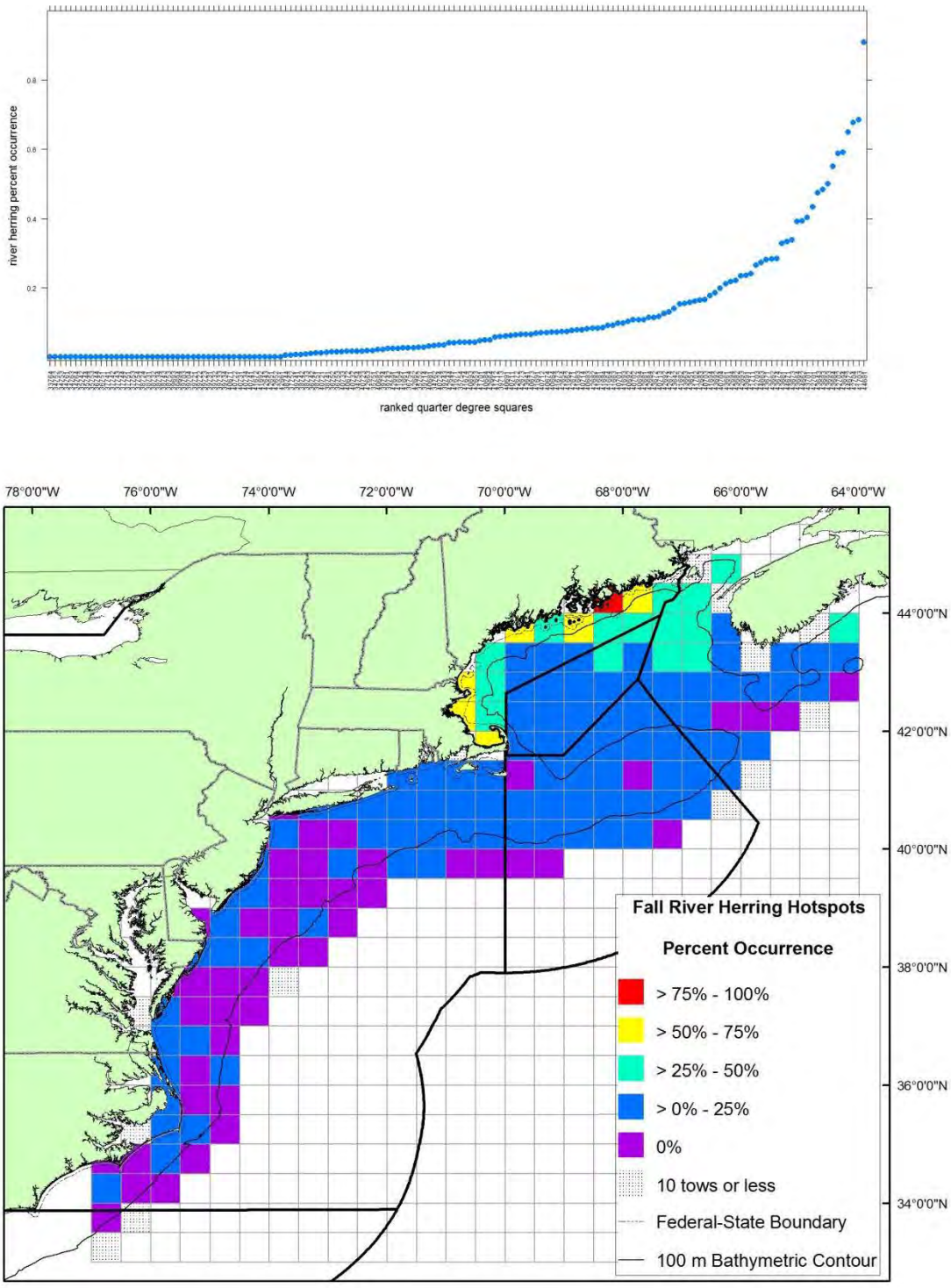


Figure A33: Percent occurrence of river herring in fall research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by quarter degree squares grouped from > 75% - 100% (red), > 50% - 75% (yellow), > 25% - 50% (aqua), > 0 - 25% (blue) and 0% (purple) (bottom). Source: Fall 1963-2008 NMFS bottom-trawl surveys.

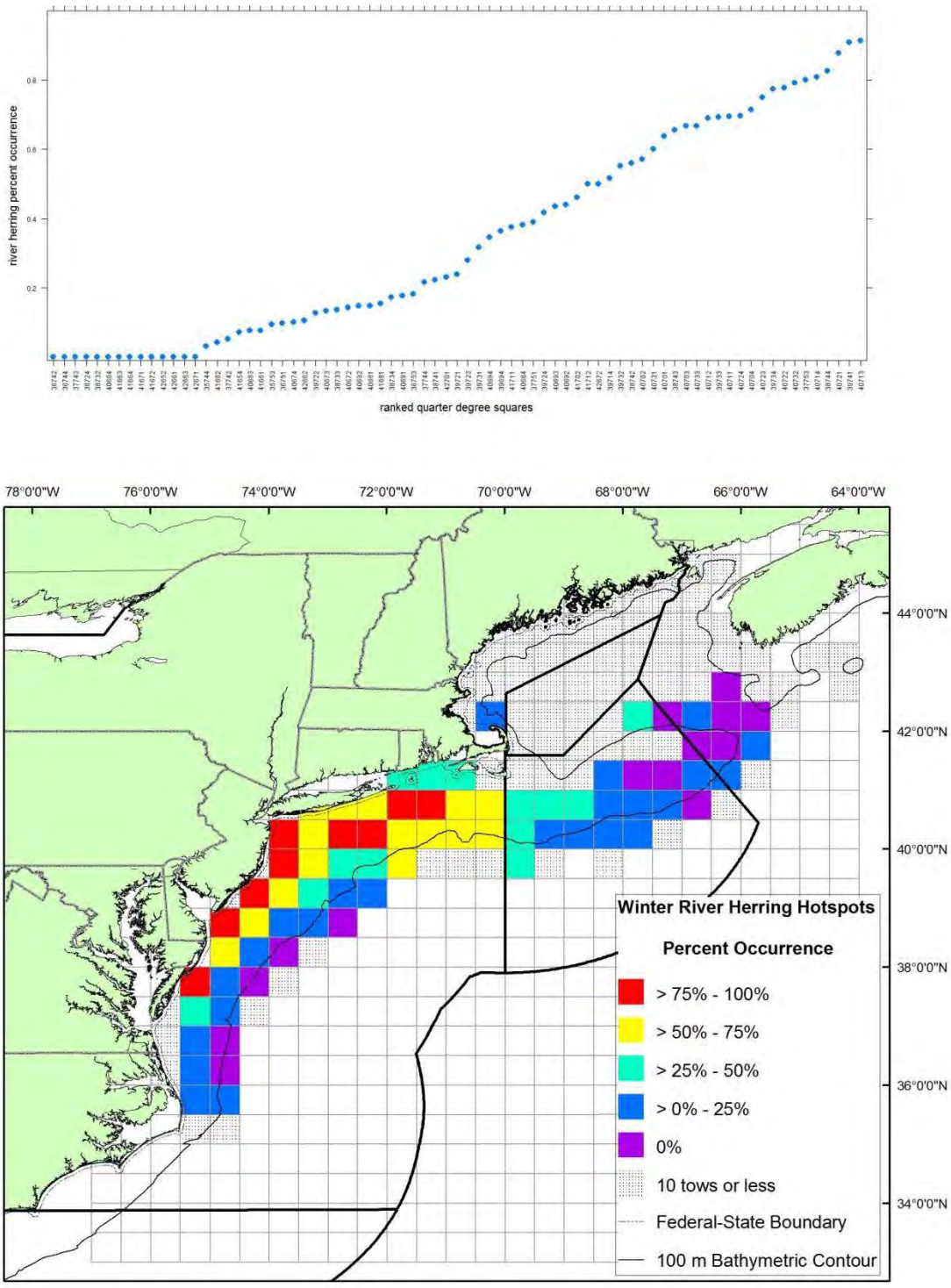


Figure A34: Percent occurrence of river herring in winter research surveys by statistical area ranked from lowest to highest (top). Map of corresponding river herring percent occurrence by quarter degree squares grouped from > 75% - 100% (red), > 50% - 75% (yellow), > 25% - 50% (aqua), > 0 - 25% (blue) and 0% (purple) (bottom). Source: Winter 1964-2007 NMFS bottom-trawl surveys.

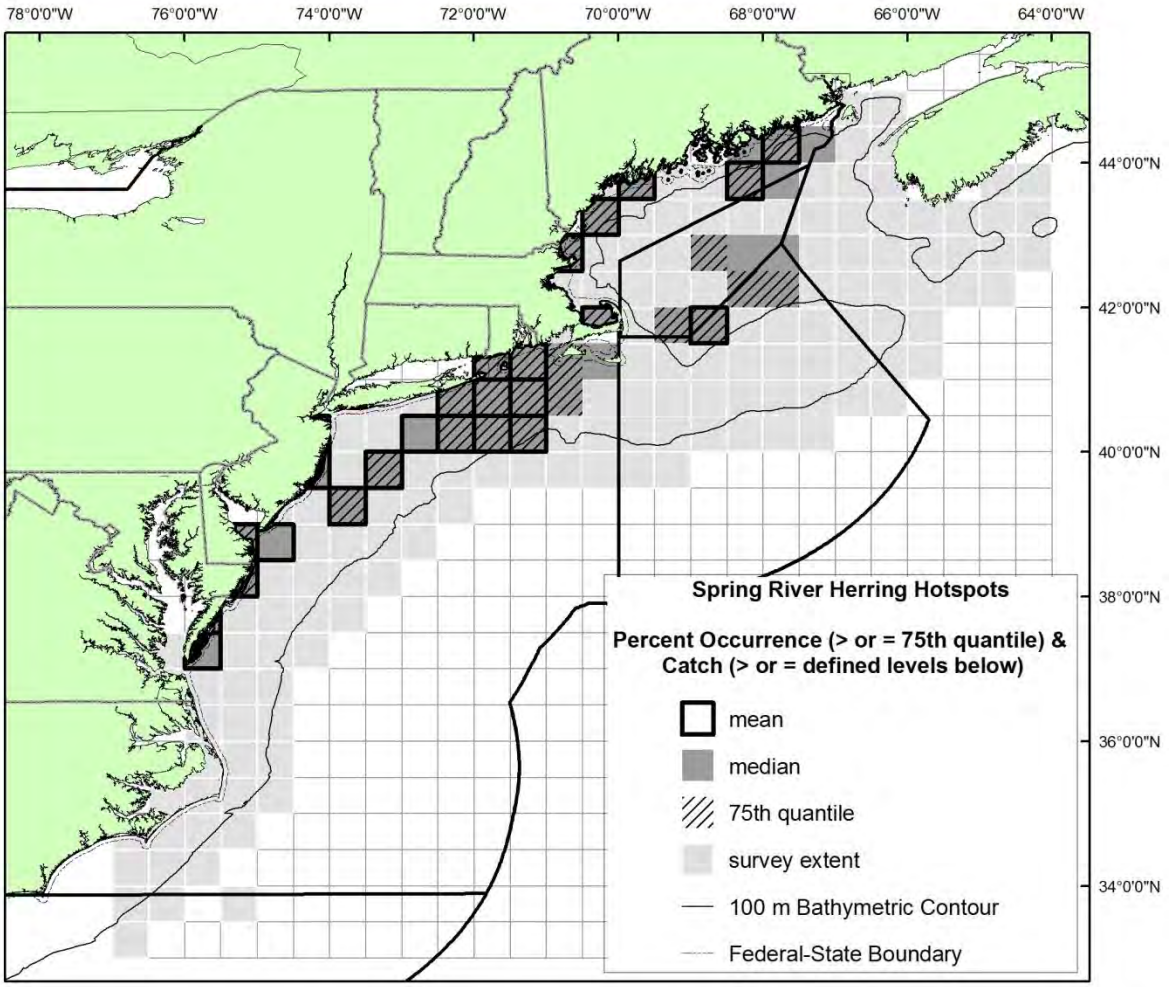


Figure A35: Spring candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (yellow outlined squares), percent occurrence and median catch in number ≥ the 75th quantiles of both variables (red squares), and percent occurrence and catch in number ≥ the 75th quantiles of both variables (hatched squares). Source: Spring 1968-2008 NMFS bottom-trawl surveys.

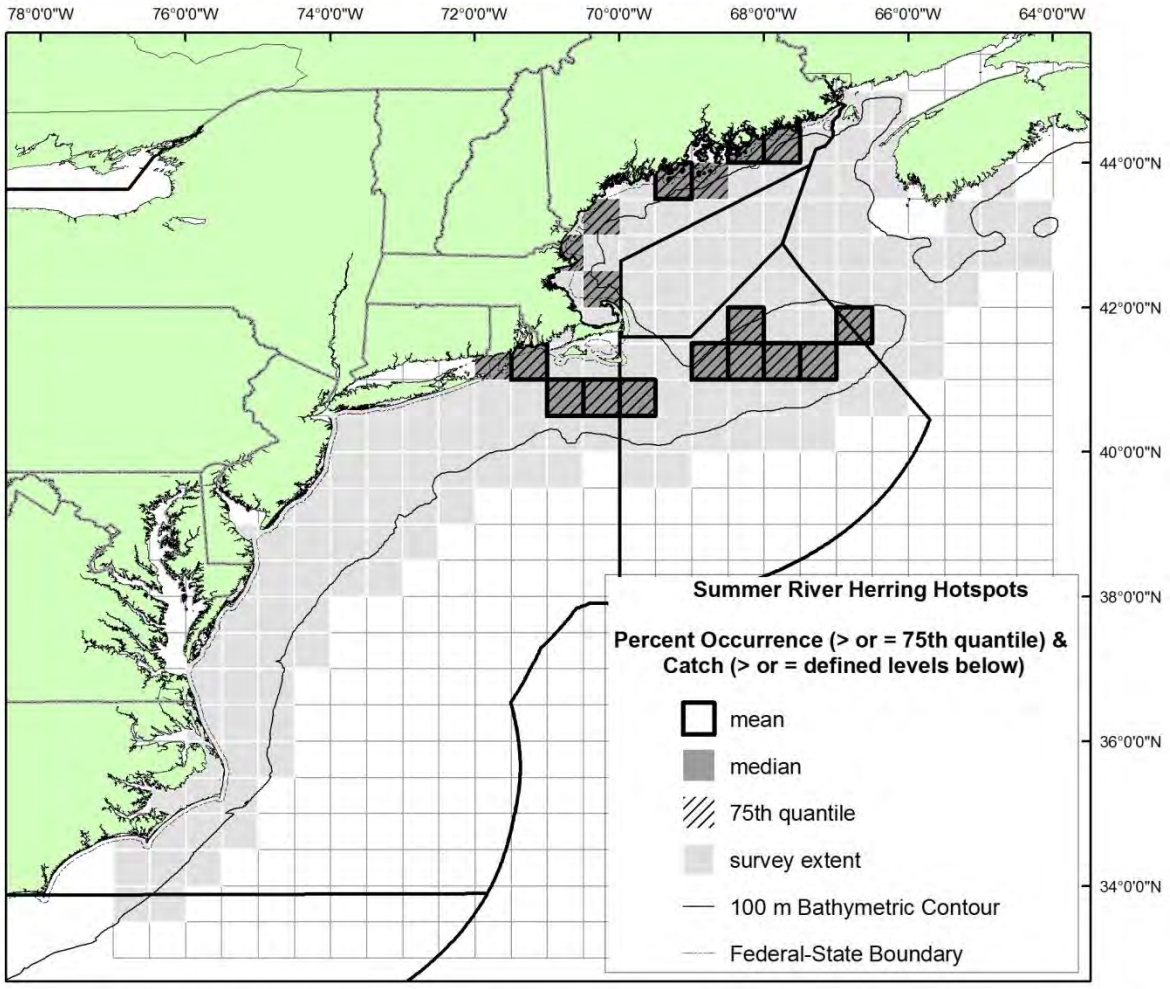


Figure A36: Summer candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (yellow outlined squares), percent occurrence and median catch in number ≥ the 75th quantiles of both variables (red squares), and percent occurrence and catch in number ≥ the 75th quantiles of both variables (hatched squares). Source: Summer 1948-1995 NMFS bottom-trawl surveys.

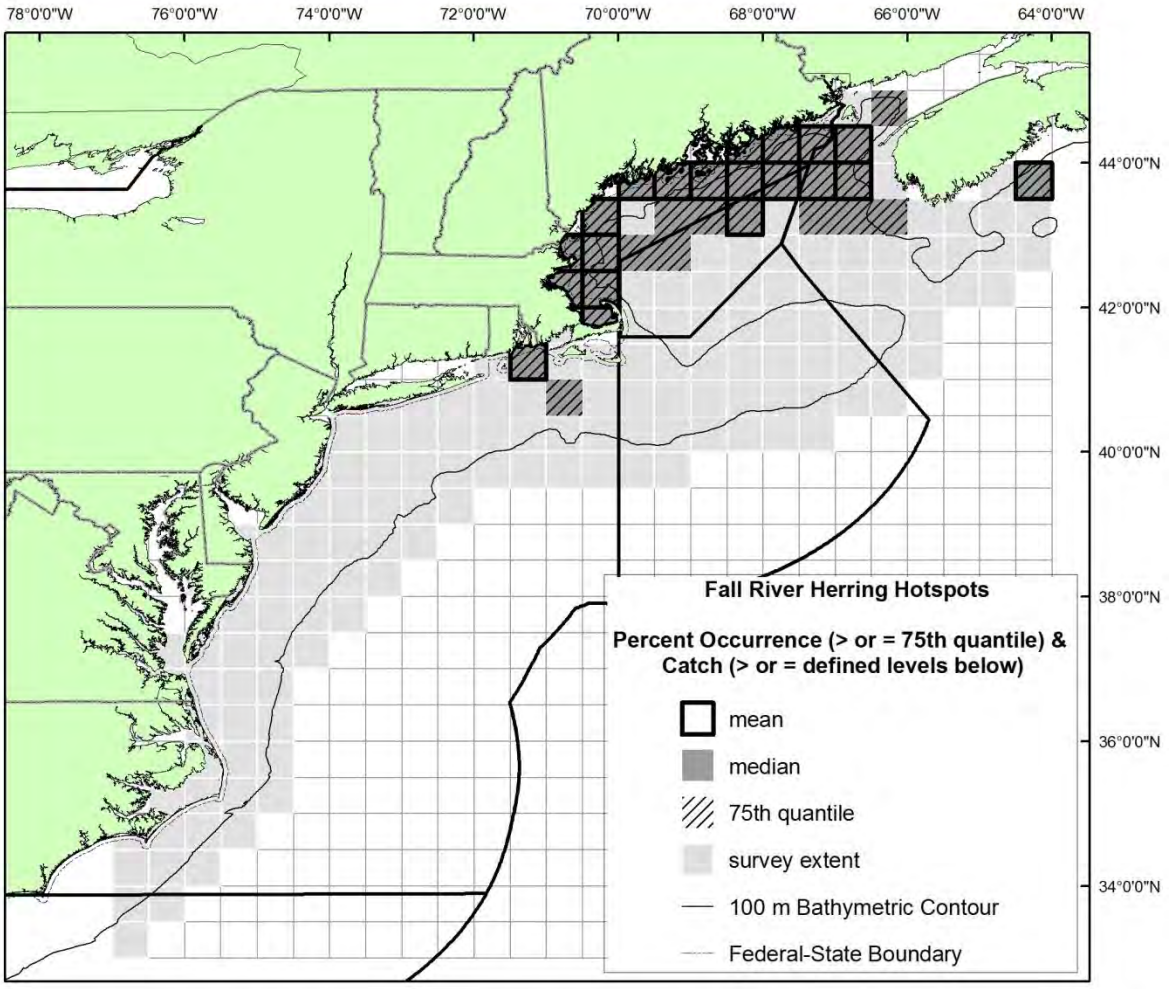


Figure A37: Fall candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (yellow outlined squares), percent occurrence and median catch in number ≥ the 75th quantiles of both variables (red squares), and percent occurrence and catch in number ≥ the 75th quantiles of both variables (hatched squares). Source: Fall 1963-2008 NMFS bottom-trawl surveys.

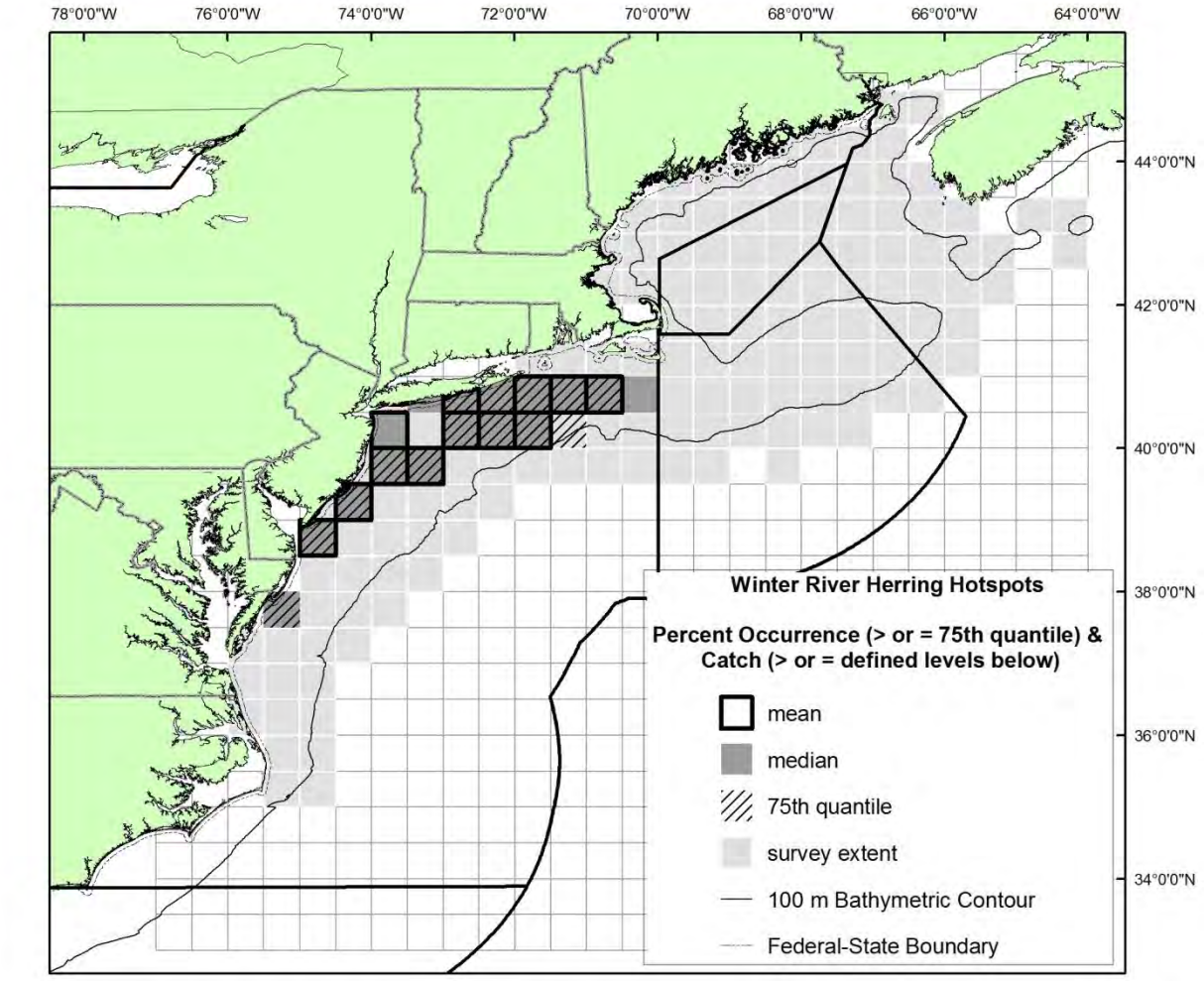


Figure A38: Winter candidate “hot spot” quarter degree squares identified as squares with percent occurrence and mean catch in number ≥ the 75th quantiles of both variables (yellow outlined squares), percent occurrence and median catch in number ≥ the 75th quantiles of both variables (red squares), and percent occurrence and catch in number ≥ the 75th quantiles of both variables (hatched squares). Source: Winter 1963-2007 NMFS bottom-trawl surveys.

DRAFT

SUPPLEMENTAL MATERIAL

UPDATE: Identification of river herring hotspots at sea using fisheries dependent and independent datasets

Prepared for the Atlantic Herring PDT

by

Jamie Cournane[1]

Steven Correia[2]

[1]University of New Hampshire and Environmental Defense Fund

[2]Massachusetts Division of Marine Fisheries

August 2010

Jan-Feb	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
0	22	181	0	203
> 0.5 - 40	23	3	0	26
> 40 - 129	15	16	0	31
> 129 - 358	14	17	0	31
> 358 - 1233	16	12	0	28
> 1233 - 69004	10	21	0	31
maximum= 69,004 ALL	100	250	0	350

Jul-Aug	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
none	21	154	147	322
> 0.5 - 40	13	1	0	14
> 40 - 129	0	0	3	3
> 129 - 358	0	0	2	2
> 358 - 1233	0	0	0	0
> 1233 - 69004	0	0	0	0
maximum= 358 ALL	34	155	152	341

Mar-Apr	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
none	4	94	0	98
> 0.5 - 40	0	5	0	5
> 40 - 129	0	5	0	5
> 129 - 358	0	9	0	9
> 358 - 1233	0	6	0	6
> 1233 - 69004	0	2	0	2
maxium= 12,339 ALL	4	121	0	125

Sep-Oct	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
none	22	365	63	450
> 0.5 - 40	3	2	0	5
> 40 - 129	2	4	0	6
> 129 - 358	0	2	0	2
> 358 - 1233	0	4	0	4
> 1233 - 69004	0	5	0	5
maximum= 13,280 ALL	27	382	63	472

May-Jun	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
none	0	132	67	199
> 0.5 - 40	0	4	1	5
> 40 - 129	0	1	0	1
> 129 - 358	0	0	1	1
> 358 - 1233	0	1	0	1
> 1233 - 69004	0	0	0	0
maximum= 384 ALL	0	138	69	207

Nov-Dec	Gear Category			
River Herring Weight (lbs)	OT	PR	PS	ALL
none	11	184	4	199
> 0.5 - 40	0	6	0	6
> 40 - 129	1	14	0	15
> 129 - 358	1	15	0	16
> 358 - 1233	2	20	0	22
> 1233 - 69004	1	21	0	22
maximum= 19,680 ALL	16	260	4	280

Table S1: Frequency table of river herring bycatch (lbs) in observed hauls and sets for directed herring trips by gear type and bimonthly blocks. Gear categories include bottom otter-trawls (OT), purse seines (PS), and mid-water trawls-single and paired (PR). Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Note this table corresponds with the scaled pink circles in Appendix Figs. A1-A6. Source: NEFOP Database 2005-2009.

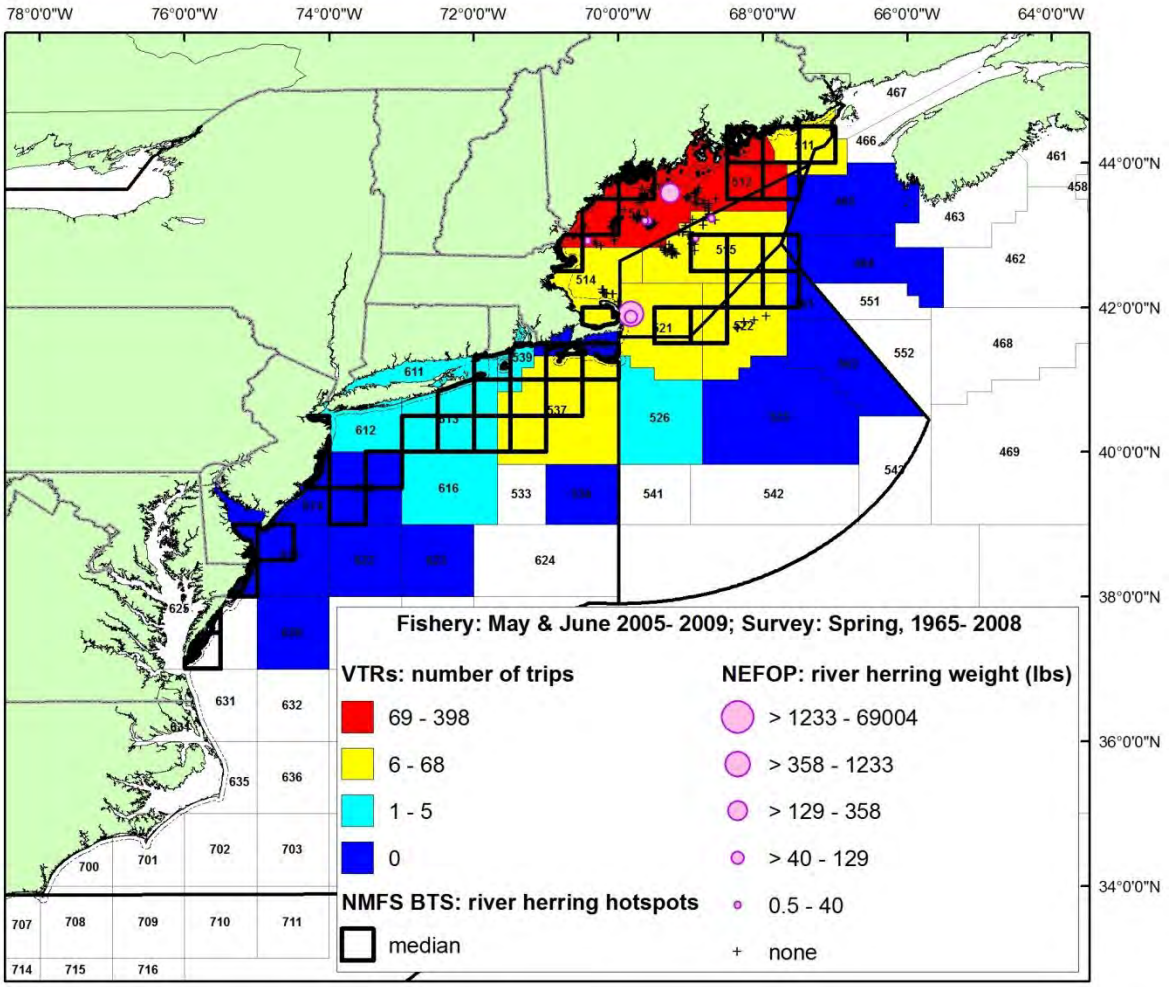


Figure S1: Reported trips (VTR) and observed hauls and sets (NEFOP) during May and June, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-398 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Spring candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Spring 1965-2008 NMFS bottom-trawl surveys.

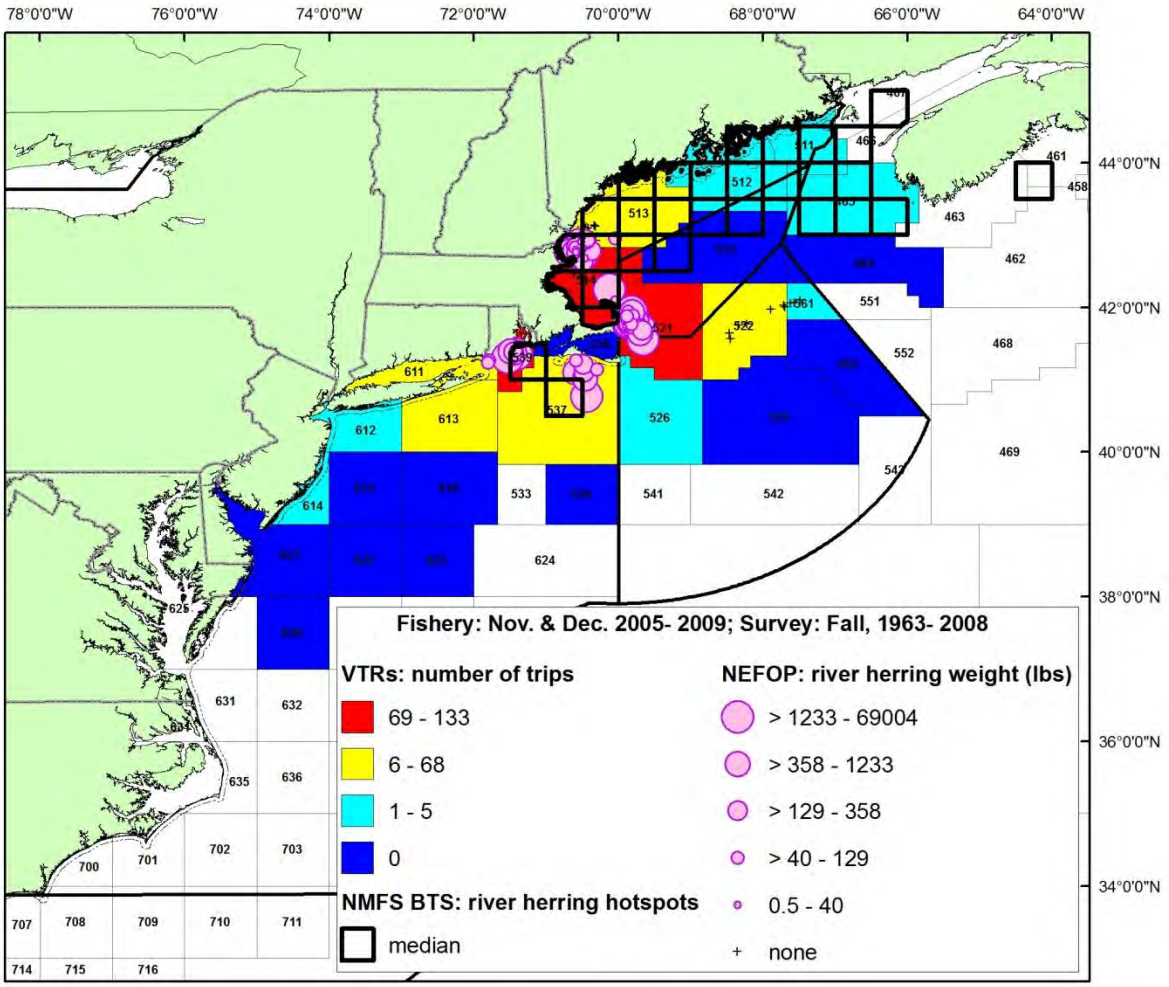


Figure S2: Reported trips (VTR) and observed hauls and sets (NEFOP) during November and December, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-133 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Fall candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Fall 1963-2008 NMFS bottom-trawl surveys.

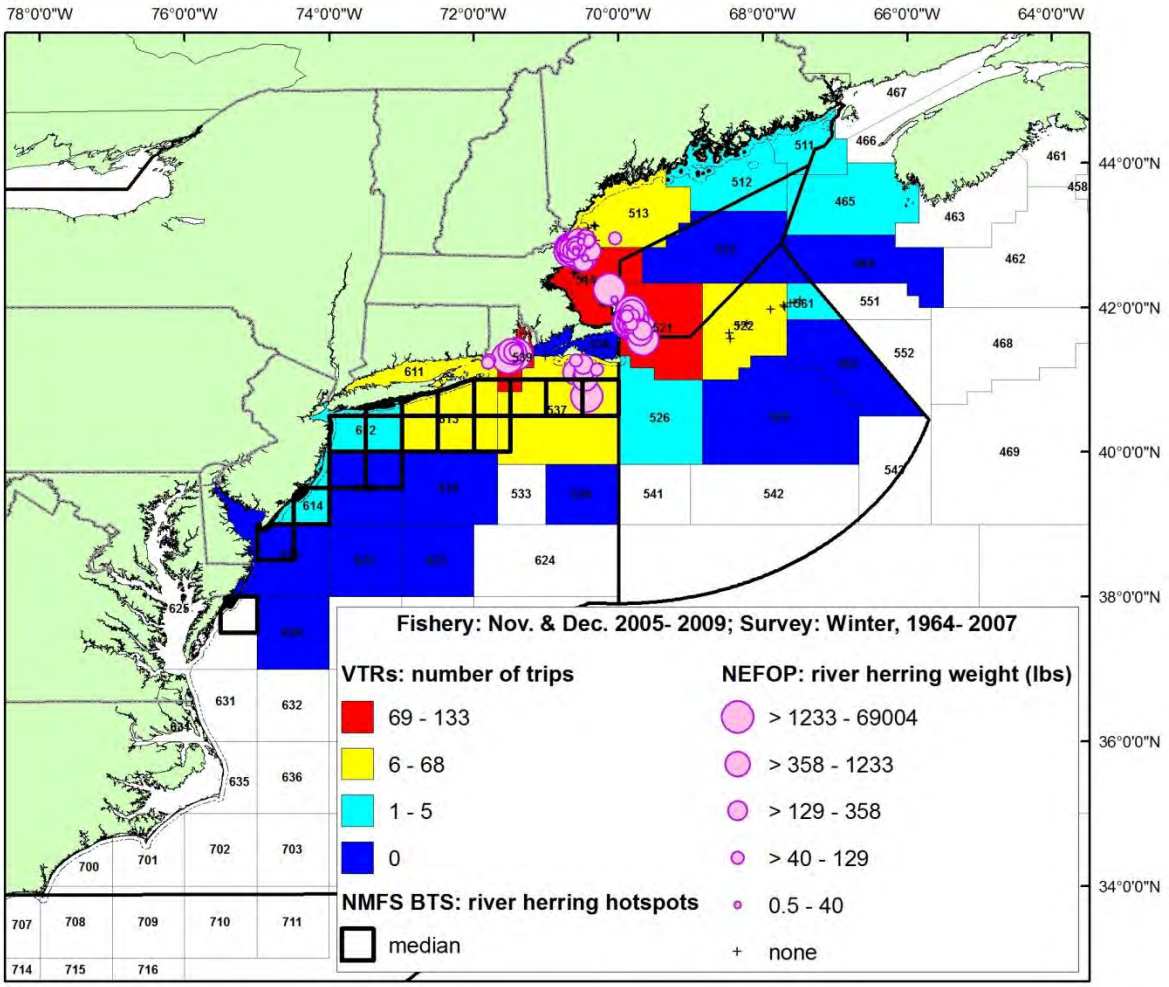


Figure S3: Reported trips (VTR) and observed hauls and sets (NEFOP) during November and December, 2005-2009 for directed herring trips by bottom otter-trawls, purse seines, and mid-water trawls (single and paired). Trips by statistical area are grouped from 69-133 (red), 6-68 (yellow), 1-5 (aqua), and 0 (dark blue) trips. Scaled pink circles represent river herring bycatch (lbs) in observed hauls and sets for directed herring trips. A "+" signifies that an observed haul or set did not catch river herring. Directed herring trips are defined as 2,000 lbs of kept Atlantic herring on a trip. Winter candidate river herring “hot spot” quarter degree squares identified as squares with percent occurrence and median catch in number ≥ the 75th quantiles of both variables (bold outlined quarter degree squares). Sources: VTR Database 2005-2009, NEFOP Database 2005-2009, and Winter 1963-2007 NMFS bottom-trawl surveys.

DRAFT

Spatial Management Alternatives to Address

River Herring Bycatch in the Directed Atlantic Herring Fishery

Prepared for the Atlantic Herring PDT

by

Jamie M. Cournane, Ph.D.

University of New Hampshire, Durham, NH and

Environmental Defense Fund, Boston, MA

and

Steven J. Correia

Massachusetts Division of Marine Fisheries, New Bedford, MA

December 2010

DRAFT

Purpose

The current Atlantic Herring Fishery Management Plan (FMP) Amendment 5 (A5) draft discussion document contains several management alternatives to address river herring (alewife, *Alosa pseudoharengus*, and blueback herring, *Alosa aestivalis*) bycatch in the directed Atlantic herring, *Clupea harengus*, fishery (NEFMC 2010). The management alternatives under consideration include 100% monitoring, Closed Area I provisions, a move-along rule, implementing the Sustainable Fisheries Coalition (SFC) project through a Framework Adjustment (FW), and closed areas. Several of these alternatives have sub-options based on 100% or less than 100% observer coverage. These alternatives would apply in bimonthly river herring hotspots using a two-stage approach, based on three hotspot configuration options from fishery (stage 1) and research survey hotspots (stage 2). Recently, the Plan Development Team (PDT) has been encouraged to streamline the river herring hotspot analysis (Cournane and Correia 2010a-c).

Spatial Management Alternatives to Address River Herring Bycatch

In general, the management alternatives fall under three broad management goals: monitoring, avoidance, and protection. These three management goals can be linked to the design of spatial management alternatives (Table 1). Here in the proposed framework, the existing A5 management "alternatives" become management "options" under the spatial management alternatives.

Management Goal	Spatial Management Alternative	Management Option
Monitoring	1. River Herring Monitoring Areas	A.100% monitoring B. Closed Area I provisions
Avoidance	2. River Herring Avoidance Areas	A. Move-along rule B. SFC project/FW adjustment
Protection	3. River Herring Protected Areas	A. Closed areas

Table 1: Reframing A5 management "alternatives" as management "options" under spatial management alternatives linked to specific management goals.

Goal

Here, the goal is to design spatial management alternatives to address river herring bycatch in the directed Atlantic herring fishery that are ecologically based, simple to understand, and enforceable. The alternatives should also link directly to the management measures under consideration in A5.

Design Considerations

Depending on the management goal, configurations for spatial management alternatives might include using existing Atlantic Herring FMP management areas, Fisheries Statistical Areas, extending the timing of the inshore Atlantic Herring spawning closure, or creating new spatial

DRAFT

management areas. However, spatial management alternatives should be based on the river herring hotspot analysis, maintaining the bimonthly stratification. Selection of areas for inclusion should focus on the fishery hotspots, but also consider the survey hotspots based on management goals. Therefore, creating new spatial management areas based on fisheries encounters with river herring and the expected distribution of river herring should be the focus.

The size and the shape of the spatial management alternatives should reflect the management goals. In general, the size of a river herring monitoring or avoidance area might be greater than a river herring protected area. In addition, contiguous areas might be preferred to several disconnected discrete areas to achieve monitoring or avoidance goals.

Example Configurations

The following bimonthly maps display possible spatial management alternatives linked to specific management goals to address river herring bycatch in the Atlantic Herring Fishery (Figures 1-12). Table 2 summarizes the design elements of the possible spatial management alternatives. In addition, possible river herring monitoring areas were scaled up to the level of statistical areas for reference (Figures 1-6).

Spatial Management Alternative	Stage 1 Hotspots	Stage 2 Hotspots	Figures
River Herring Monitoring Areas	> 40 lbs	YES	1- 6
River Herring Avoidance Areas	> 40 lbs	NO	7- 12
River Herring Protected Areas	> 1233 lbs	NO	13- 16

Table 1: Example design of possible spatial management alternatives using the river herring hotspot analysis. Stage 1 (fishery) hotspots are identified as quarter-degree squares within a bimonthly block with at least one river herring encounter in the directed Atlantic herring fishery greater than the specified threshold level (here 40 lbs or 1233 lbs), based on observer data. Stage 2 (survey) hotspots are identified as quarter-degree squares within a seasonal survey with relative high percent occurrence and high catch of river herring, based on NMFS bottom-trawl surveys.

DRAFT

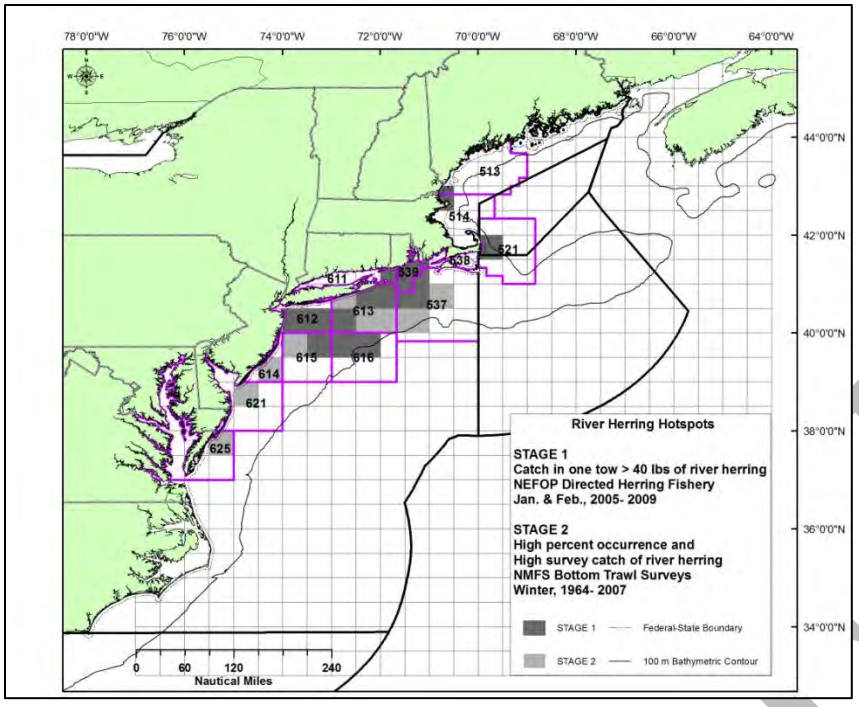


Figure 1: River herring monitoring areas alternative, January- February.

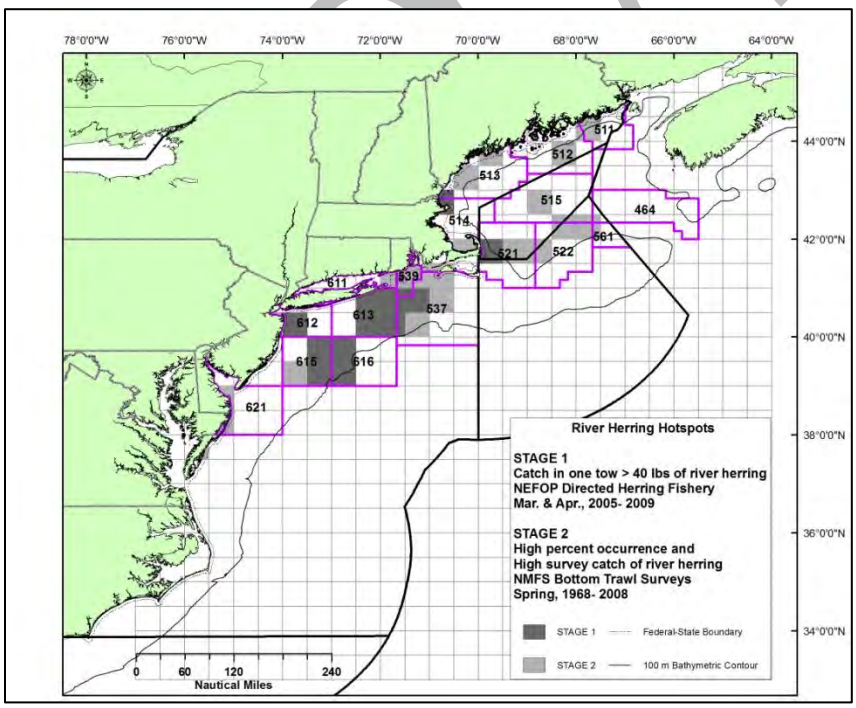


Figure 2: River herring monitoring areas alternative, March- April.

DRAFT

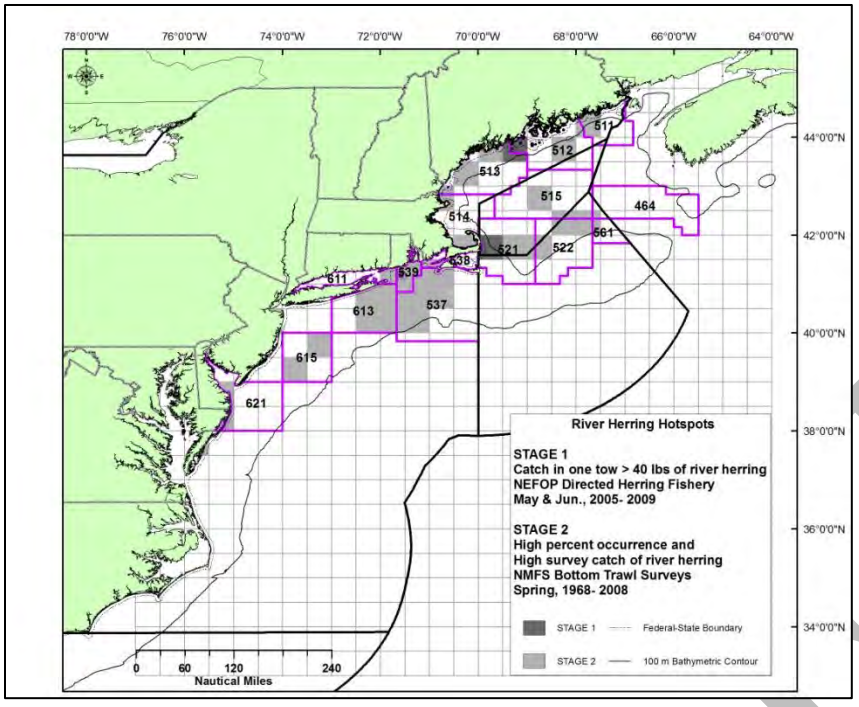


Figure 3: River herring monitoring areas alternative, May- June.

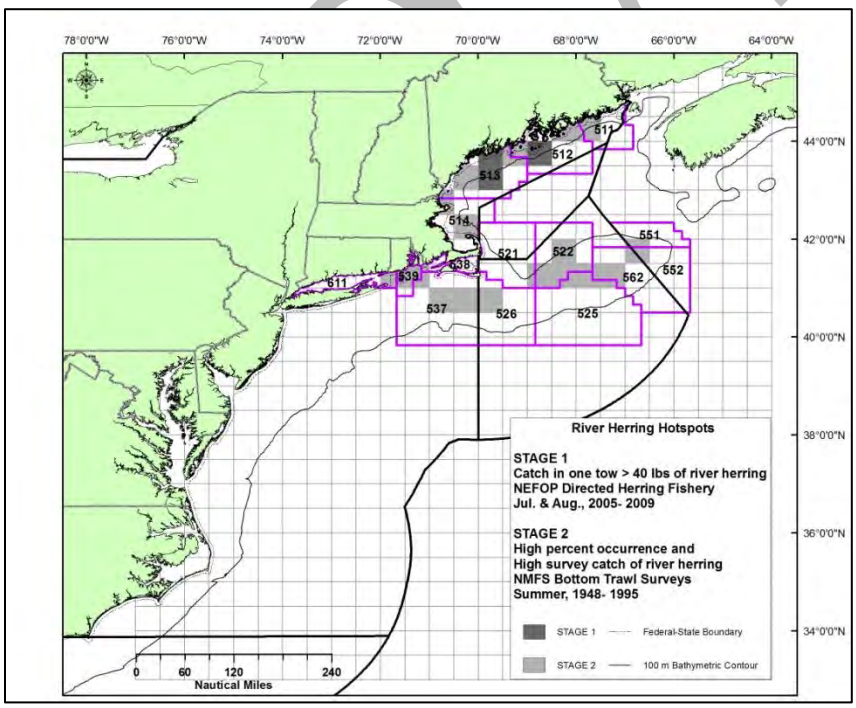


Figure 4: River herring monitoring areas alternative, July- August.

DRAFT

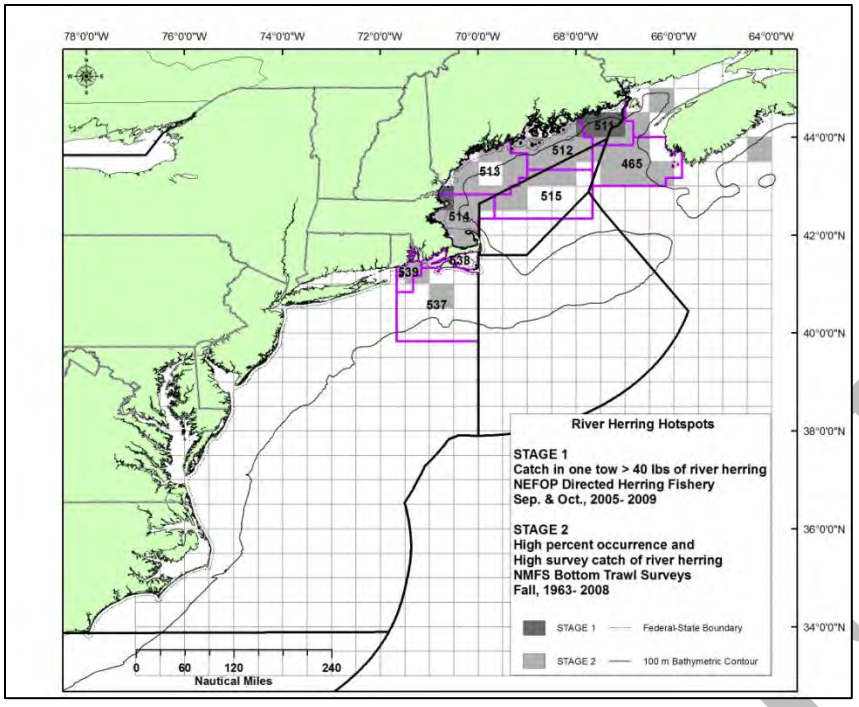


Figure 5: River herring monitoring areas alternative, September- October.

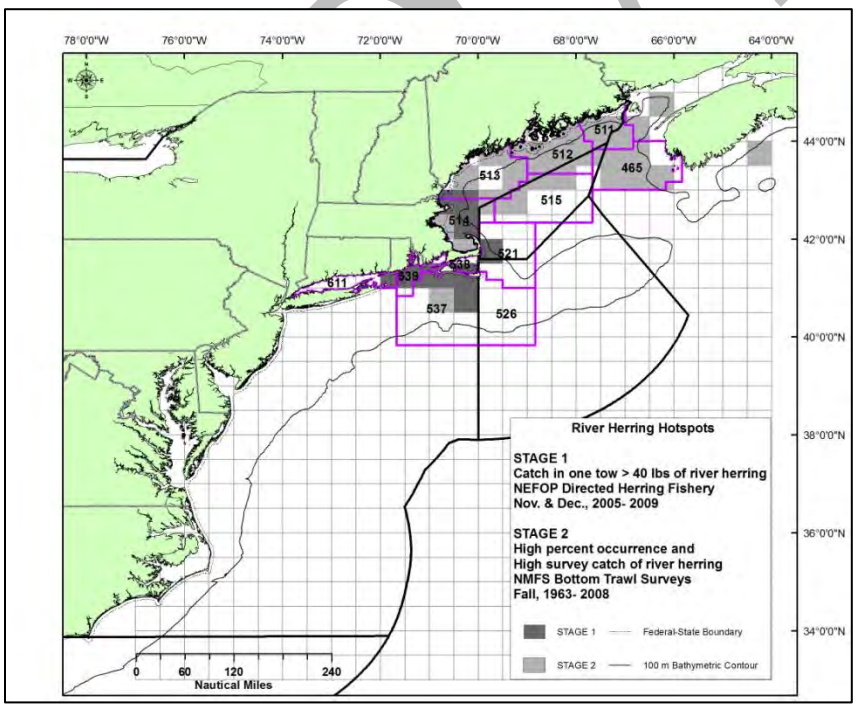


Figure 6: River herring monitoring areas alternative, November- December.

DRAFT

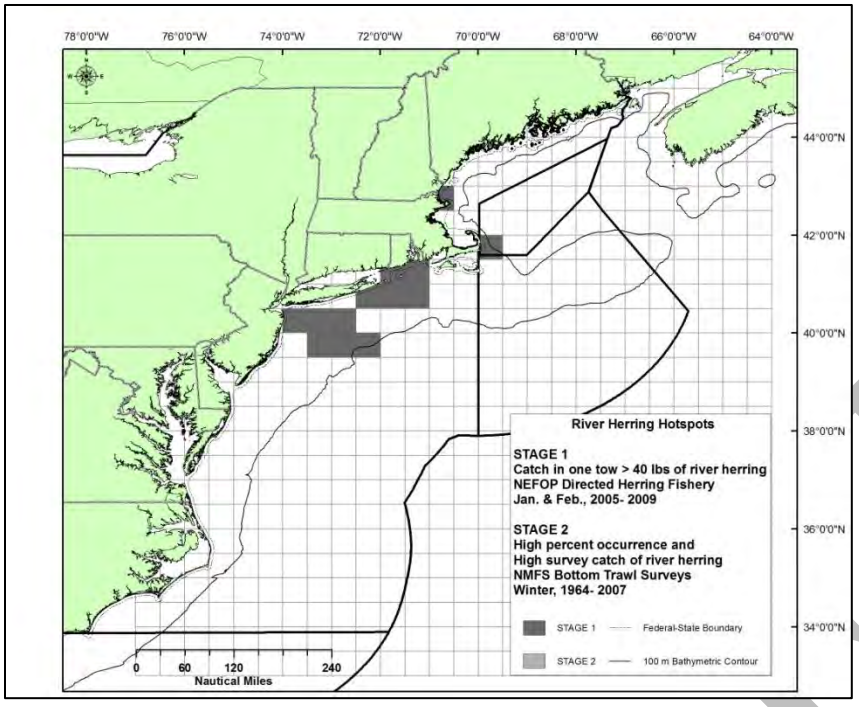


Figure 7: River herring avoidance areas alternative, January- February.

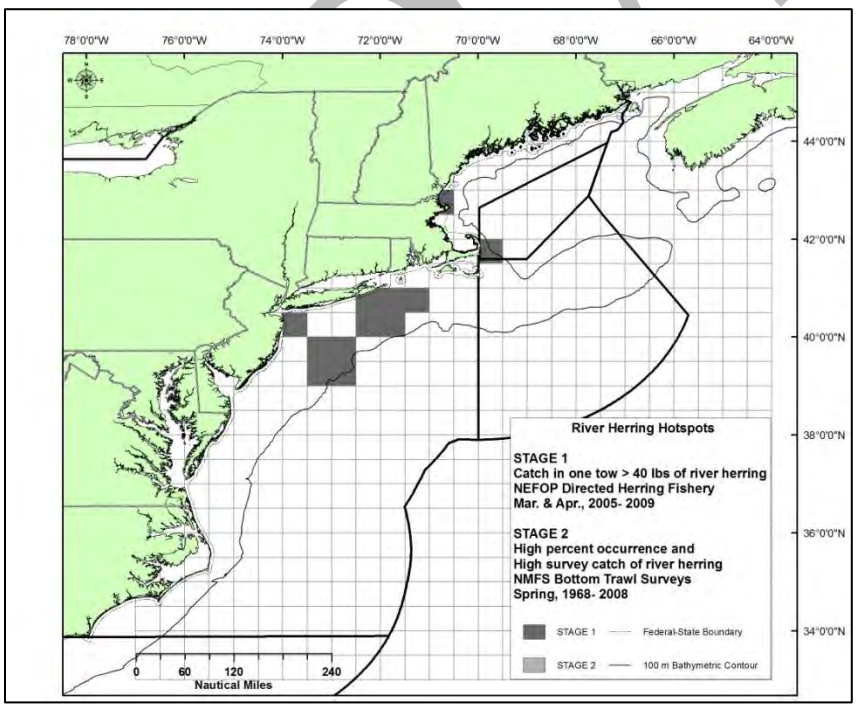


Figure 8: River herring avoidance areas alternative, March- April.

DRAFT

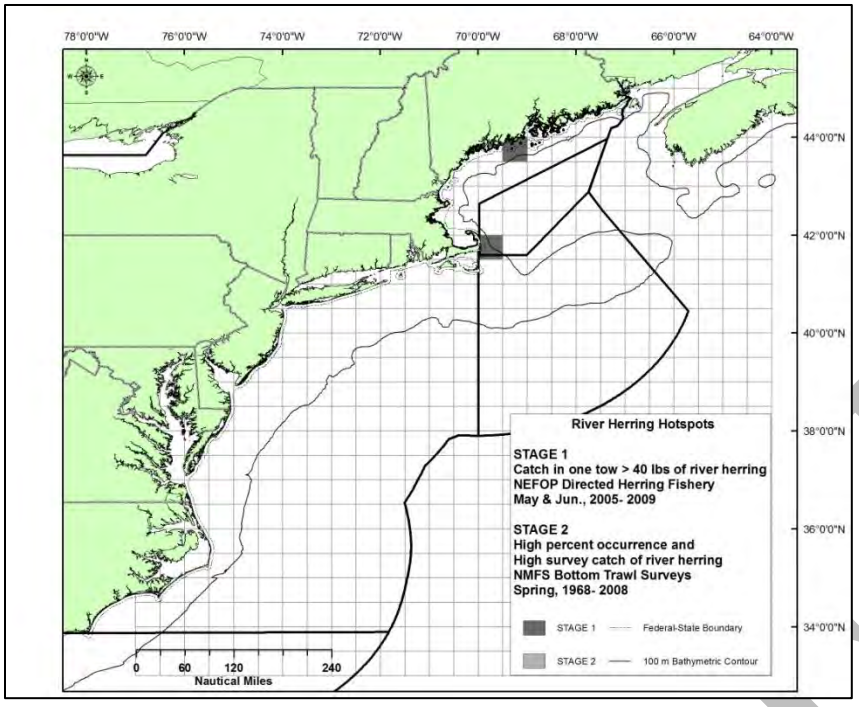


Figure 9: River herring avoidance areas alternative, May- June.

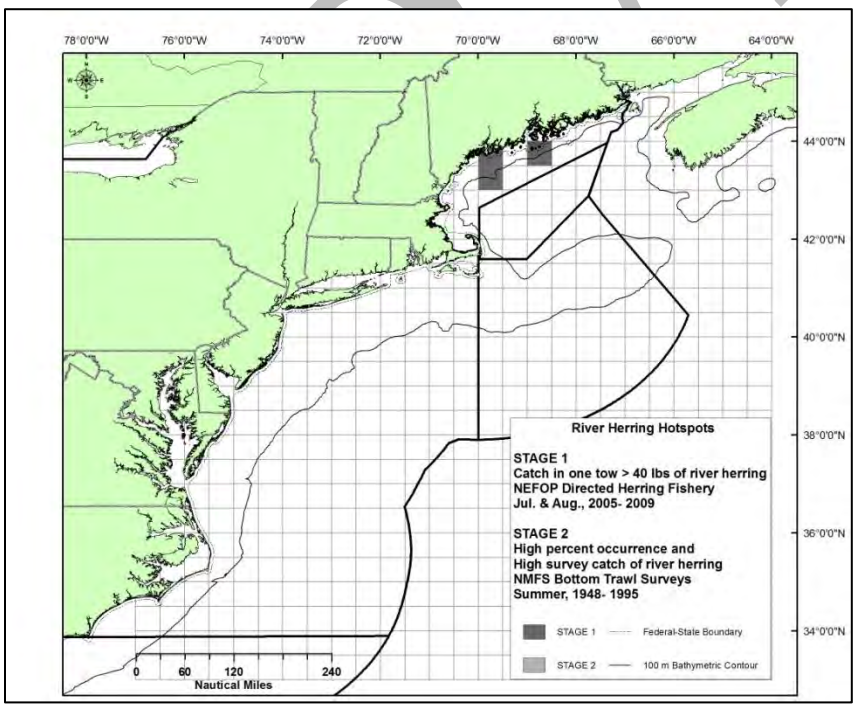


Figure 10: River herring avoidance areas alternative, July- August.

DRAFT

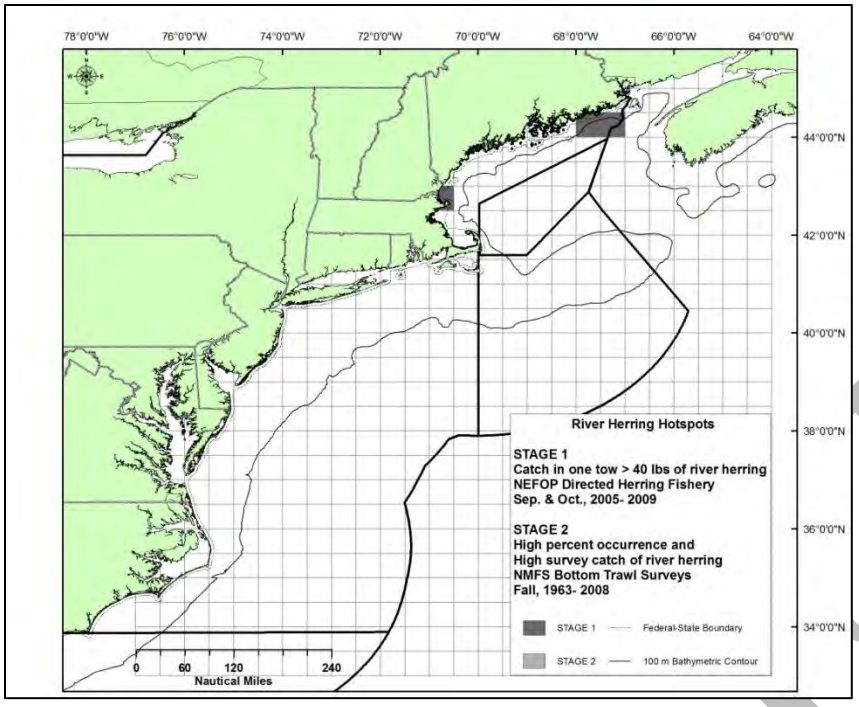


Figure 11: River herring avoidance areas alternative, September- October.

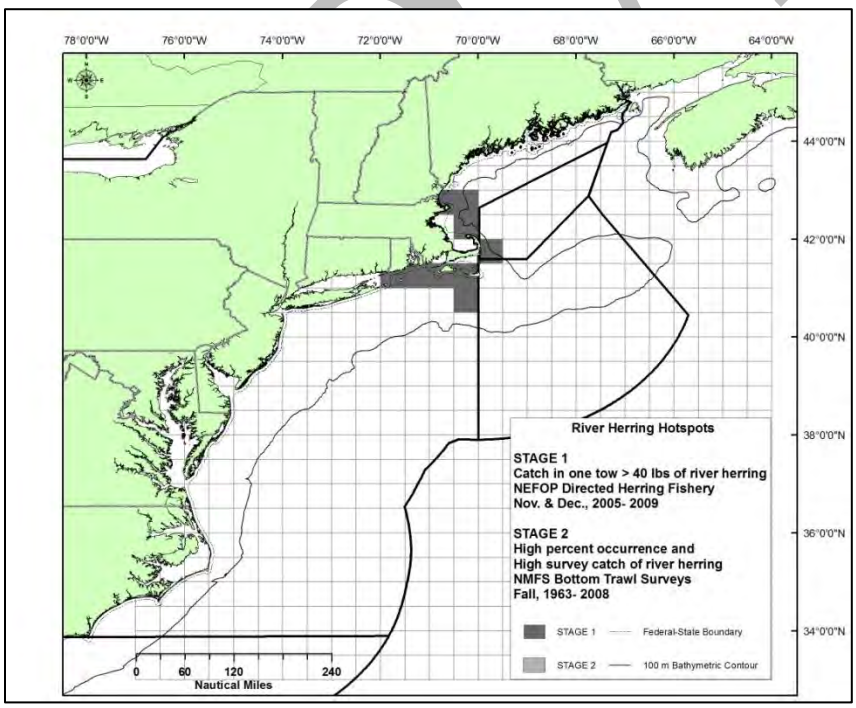


Figure 12: River herring avoidance areas alternative, November- December.

DRAFT

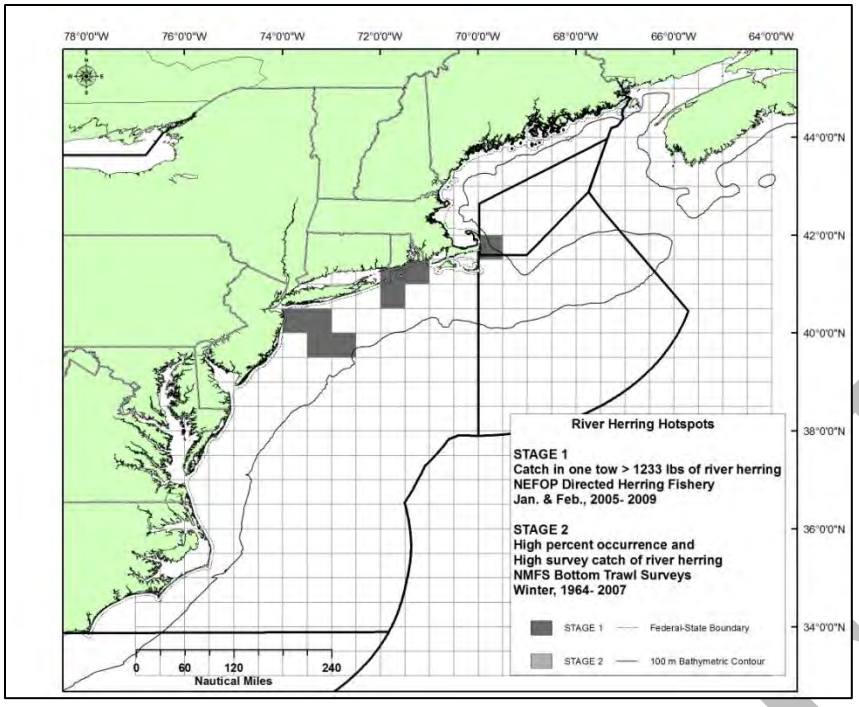


Figure 13: River herring protected areas alternative, January- February.

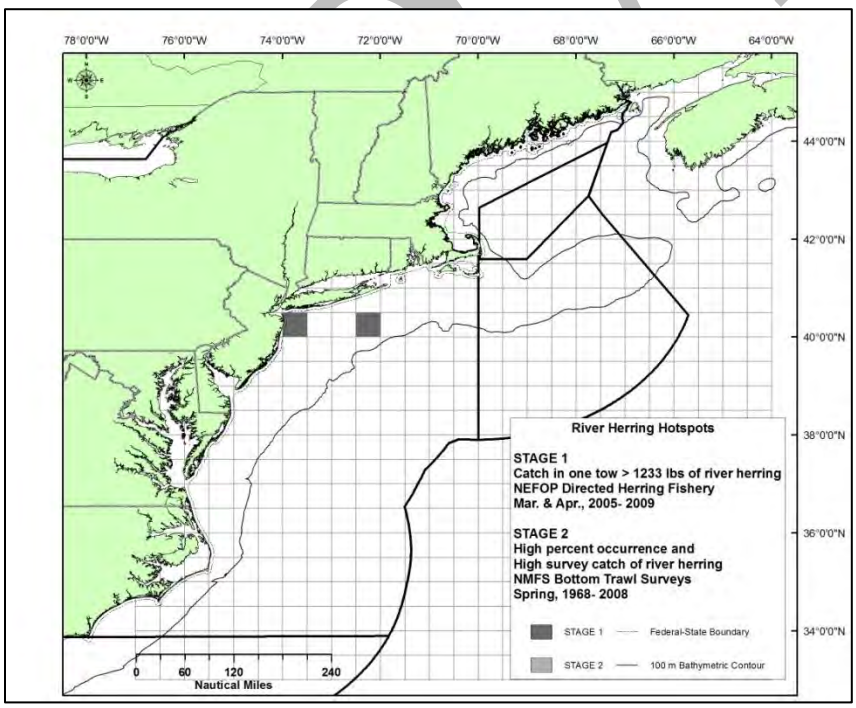


Figure 14: River herring protected areas alternative, March- April.

DRAFT

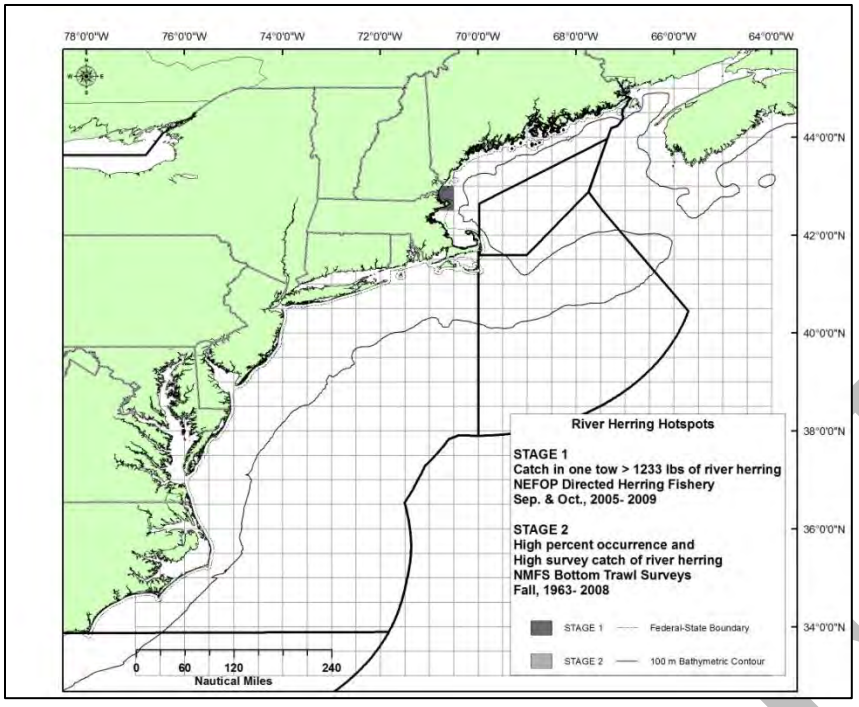


Figure 15: River herring protected areas alternative, September- October.

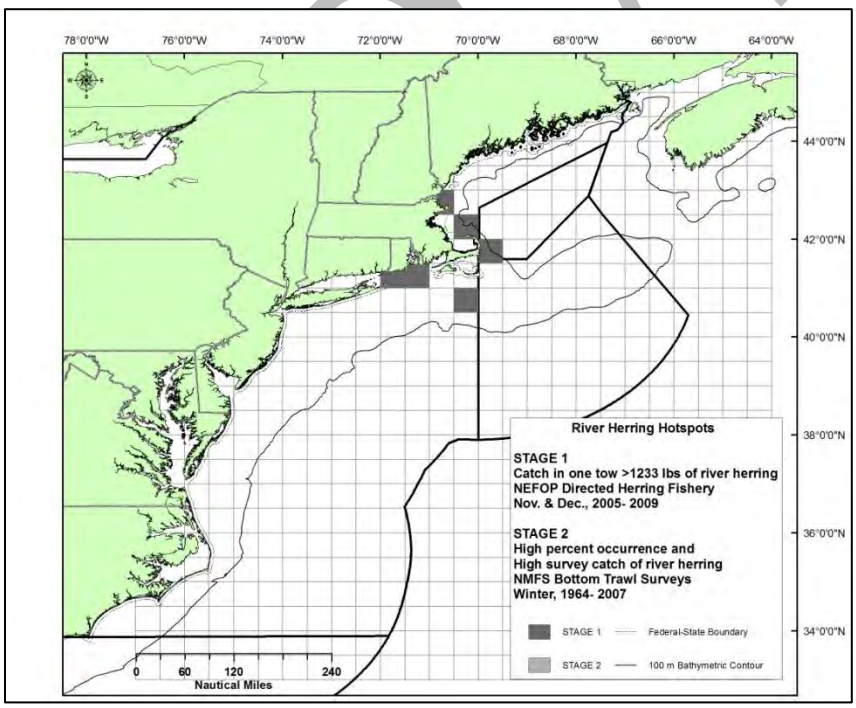


Figure 16: River herring protected areas alternative, November- December.

DRAFT

Literature Cited

Cournane, J. and S. Correia. 2010a. *Identification of river herring hotspots at sea using multiple fishery dependent and independent datasets*. Report prepared for the Atlantic Herring PDT, NEFMC. July, 2010.

Cournane, J. and S. Correia. 2010b. *UPDATE: Identification of river herring hotspots at sea using fishery dependent and independent datasets*. Report prepared for the Atlantic Herring PDT, NEFMC. August, 2010.

Cournane, J. and S. Correia. 2010c. *SUPPLEMENTAL MATERIAL- UPDATE: Identification of river herring hotspots at sea using fishery dependent and independent datasets*. Report prepared for the Atlantic Herring PDT, NEFMC. August, 2010.

NEFMC. 2010. *Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP): Draft Discussion Document*. November 30, 2010.

DRAFT

Appendix V

Spatial and Temporal Analysis of River Herring Bycatch in the Northern Shrimp Fishery

Jamie M. Cournane, PhD University of New

Hampshire, Durham, NH

Purpose

At its September 2011 meeting, the New England Fishery Management Council (NEFMC) passed a motion,

> *to modify Section 3.3.2.2 [Amendment 5 DEIS] to exempt vessels fishing under the small mesh northern shrimp fishery exemption with the finfish excluder device as described in CFR §648.80 or vessels fishing with mesh greater than 5 ½ inches from the provisions under Options 1 and 2 in the section.*

This prompted the Atlantic herring plan development team (PDT) to investigate the river herring bycatch in the Northern shrimp fishery. In particular, this work 1) summarizes past studies to reduce bycatch in the Northern shrimp fishery and 2) evaluates if spatial management measures designed to address river herring bycatch in the Atlantic herring fishery also interact the Northern shrimp fishery.

Past Studies to Reduce Bycatch in the Northern Shrimp Fishery

The finfish-excluder device (FED), the Nordmore grate, has been mandatory in the Gulf of Maine Northern shrimp (*Pandalus borealis*) fishery since April 1992. Prior to its use, juvenile groundfish bycatch in the shrimp fishery was of primary concern (Howell and Langan 1992). Groundfish bycatch has been substantially reduced through the use of the Nordmore grate (Richards and Hendrickson 2006), and a new gear innovation, the "topless" trawl, also greatly reduces pelagic fish bycatch (He et al. 2007).

Richards and Hendrickson (2006) examined bycatch before and after use of the Nordmore grate in the shrimp fishery, using observer data from NEFOP and MA DMF. Primarily, they examined individual groundfish and flatfish species bycatch, but they did also summarize pelagic species bycatch as a group. In their analysis, pelagic species included alewife (*Alosa pseudoharengus*), butterfish (*Peprilus triacanthus*), blueback herring (*Alosa aestivalus*), Atlantic herring (*Clupea harengus*), unidentified herring (Clupeidae), Atlantic mackerel (*Scomber scombrus*), Atlantic menhaden (*Brevoortia tyrannus*), American shad (*Alosa sapidissima*), and hickory shad (*Alosa mediocris*). Prior to the use of the Nordmore grate, primary bycatch species included groundfish and flatfish, and secondarily pelagic fish (see Table 3 of Richards and Hendrickson 2006). With the grate in place, groundfish and flatfish bycatch was greatly reduced, while pelagic fish bycatch shifted up in importance based on percentage bycatch composition.

For these reasons, additional gear modifications have been investigated to reduce pelagic species bycatch. Previous experiments demonstrate that the "topless trawl" used with the Nordmore grate further reduces finfish bycatch especially for pelagic species in the shrimp fishery (He et al.

2007). Bycatch of Atlantic herring was reduced by 86.6% with some increase in the catch of shrimp and flatfish bycatch. Modest reductions in blueback herring were also evident from the experiments.

GMRI monitored and documented bycatch of regulated groundfish and non-regulated species for the 2008-2009 Northern shrimp fishing season, augmenting NEFOP data collection during the same time (Eayrs et al. 2009). Eayrs et al. (2009) found that shrimp catch was 96% (GMRI data) and 92% (NOAA data) of total catch weight, of this less than 2% of total catch weight was regulated bycatch, rarely exceeding 5% of total catch weight in a single haul (roughly 55 lbs of regulated bycatch per haul in GMRI data). Eayrs et al. (2009) also looked at the effect of Nordmore grate orientation and noted orientation did not appear to impact performance, but noted limitations of the preliminary study. Eayrs et al. (2009) indicated data collection included river herring and Atlantic herring length measurements. Analysis, however, focuses on groundfish species, and therefore results for herring species are not directly provided.

Recent preliminary work suggests that spatial and temporal characteristics in bycatch in the Northern shrimp fishery may inform bycatch reduction strategies (Rillahan and He 2011). Rillahan and He (2011) analyzed 300 research tows using standard shrimp trawl nets by shrimp fishing vessels in New Hampshire and Maine between the months of February and June from 2004 to 2010. They noted that bycatch levels varied from 0.7 to 86.7% of total catch within a tow, with overall bycatch less than 20% of total catch observed. They identified 26 bycatch species, of which silver hake (*Merluccius bilinearis*) was the primary bycatch species. Silver hake bycatch predominately occurred in late spring with May landings the highest (average at 89.5% of all bycatch by weight). They noted that other pelagic bycatch species included Atlantic and blueback herring as primary bycatch species in February and March. Flatfish species including American Plaice (*Hippoglossoides platessoides*) and witch flounder (*Glyptocephalus cynoglossus*) were also important bycatch species in April, May and June. Preliminary length-frequency analysis of silver hake, American plaice and Atlantic herring suggests that the majority of species ranged from 10-25 cm total length. Forthcoming analysis will examine patterns in more detail to improve bycatch mitigation strategies.

Evaluation of Spatial Management Measures

Data

Data was provided by the Northeast Fisheries Observer Program (NEFOP). The data includes NEFOP data from observed trips between 2005 and 2010 fishing with shrimp trawl gear (NEGEAR = 058). NEFOP excluded hauls without catch from the dataset. For this analysis, alewife and blueback herring bycatch data was combined and evaluated as river herring bycatch.

Data Selection

From this data, data was aggregated into bimonthly groupings (Jan-Feb, Mar-Apr, May-Jun, Jul-Aug, Sep-Oct, Nov-Dec), as previously defined for the river herring bycatch in the Atlantic herring fishery analysis. Data was combined for all years. It was determined that data between May- October did not meet confidentiality requirements and was therefore omitted from the analysis. In addition, there were no observations of fishing activity in April and November. Remaining data met NOP Confidentiality Guidelines (at least 3 vessels for each aggregation). In

addition, data was restricted to observed hauls north of latitude 42° N. This resulted in 339 observed hauls and, that identified primary targets as Northern shrimp, SHRIMP, PANDALID (NORTHERN) and in some cases as unclassified shrimp, SHRIMP, NK.

Methods

The starting location of fishing activity from December- March was mapped on a single map, showing presence and absence of river herring bycatch within an observed haul (Figure 1). Data from the three bimonthly groupings was overlaid with the river herring monitoring/avoidance areas and protection areas (Figures 2-4) and summarized in a table (Table 1). In addition, summary statistics on river herring bycatch were provided for each bimonthly grouping (Table 2).

Results

From the NEFOP data, the Northern shrimp fishery operates exclusively in Herring FMP 1A, mostly nearshore (i.e. less than 30 NM from shore) and north of Cape Cod, MA extending to Downeast, Maine (Figure 1). The fishery is primarily prosecuted in January-February, but also extends into March and December. The greatest observed haul with river herring bycatch was 40 lbs in January-February (Table 2). Observed total river herring bycatch by bimonthly grouping was highest in January-February (703.8 lbs), then November-December (102.4 lbs), with less in March-April (29.2 lbs). The median river herring bycatch was 0.2 (January-February), 0.1 (March-April), and 0 lbs (November-December). Overall percent occurrence of river herring bycatch for all hauls was 53.4%. Percent occurrence by bimonthly grouping was 55.6% for January-February and March-April, and 41.2% for November-December.

$$\text{Percent Occurrence} = \frac{\text{number of hauls with river herring present}}{\text{number of hauls with river herring present} + \text{number of hauls with river herring absent}}$$

Interaction with River Herring Monitoring/Avoidance Areas

The fishery overlaps with the Ipswich Bay river herring monitoring/avoidance area from December- March, for the November-December (Fig. 4), January-February (Fig. 2), and March-April (Fig. 3) river herring bimonthly areas. In addition during December, the fishery overlaps with the monitoring/avoidance area directly east of the Ipswich Bay area (Fig. 4).

Interaction with River Herring Protection Areas

The fishery overlaps with the Ipswich Bay river herring protection area for the November-December bimonthly grouping (Fig. 4), with two observed hauls both with river herring bycatch (6 and 15.3 lbs). NEFOP data suggests that most fishing in the Ipswich Bay river herring protection area is occurring between January and March, when the area is open to fishing (Figures 2-4).

References

Eayrs, S., N. Stephens and M. Raymond. 2009. A contemporary assessment of the bycatch of regulated species and the Nordmore grate in the Northern shrimp fishery. Final Report. Gulf of Maine Research Institute, Portland, Maine.

He, P., D. Goethel, and T. Smith. 2007. Design and test of a topless shrimp trawl to reduce pelagic fish bycatch in the Gulf of Maine pink shrimp fishery. *J. Northw. Atl. Fish. Sci.*, 38: 13–21.

Howell, W. H., and Langan, R. 1992. Discarding of commercial groundfish specie in the Gulf of Maine shrimp fishery. *North Am. J. Fish. Manage*. 12, 568-580.

Richards, A. and L. Hendrickson. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine Northern shrimp fishery. *Fisheries Research* 81: 100-106.

Rillahan, C. and P. He. 2011. Spatial and temporal characteristics of bycatch in Northern shrimp fisheries in the Gulf of Maine, Abstract #38-3. American Fisheries Society Annual Meeting, Seattle, WA, September 2011.

Tables

	Number of hauls		
River Herring Weight (lbs)	*Jan-Feb*	*Mar-Apr*	*Nov-Dec*
none	100	28	30
0.01 - 40	125	35	21
total	225	63	51
grand total			339

Table 1: Frequency table of the number of Northern shrimp fishery hauls with river herring bycatch present (0.01-40 lbs) and absent (none) by bimonthly grouping (January-February, March-April, and November-December). Source NEFOP 2005-2010.

Summary Statistics	River Herring Weight (lbs)		
	Jan-Feb	*Mar-Apr*	*Nov-Dec*
minimum	0	0	0
maximum	40	4	20
sum	703.8	29.2	102.4
mean	3.13	0.46	2.01
median	0.2	0.1	0
standard deviation	6.58	0.91	4.13

Table 2: Summary statistics for Northern shrimp fishery hauls with river herring bycatch by bimonthly grouping (January-February, March-April, and November-December). Source NEFOP 2005-2010.

Figures

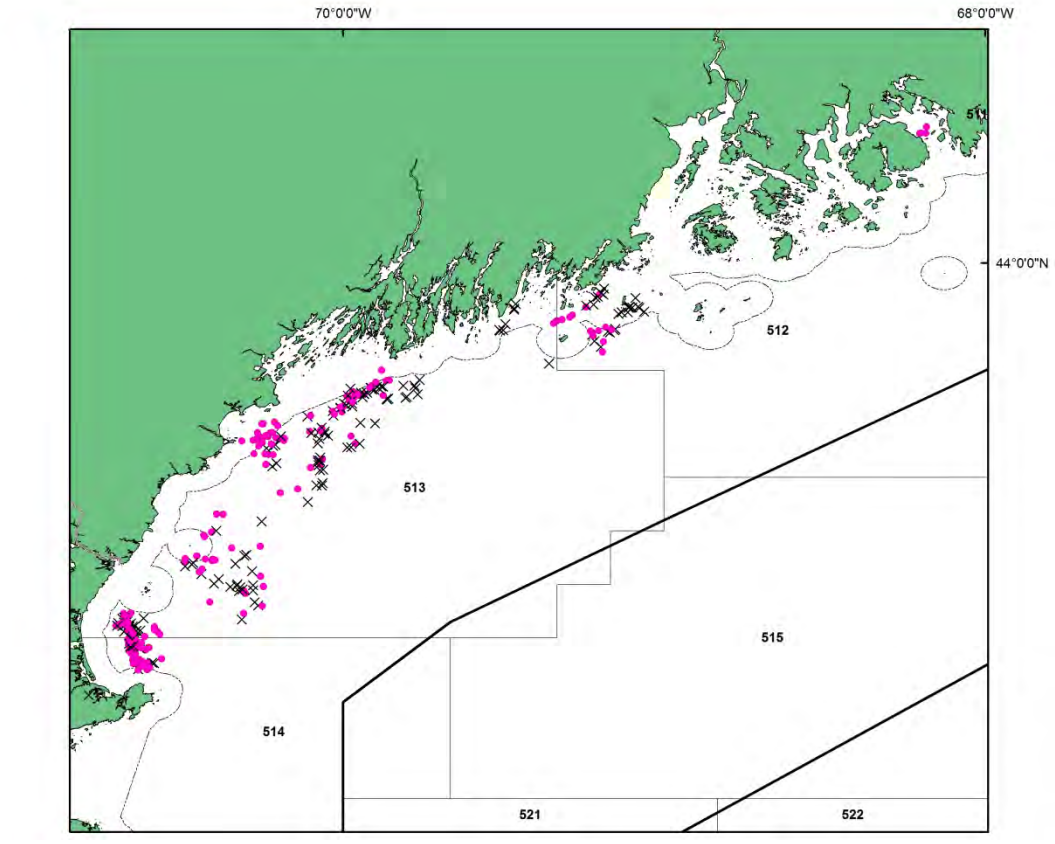


Figure 1: The starting location of observed Northern shrimp fishing activity from December-March, showing presence (circles) and absence (x') of river herring bycatch within an observed haul. Source NEFOP 2005-2010.

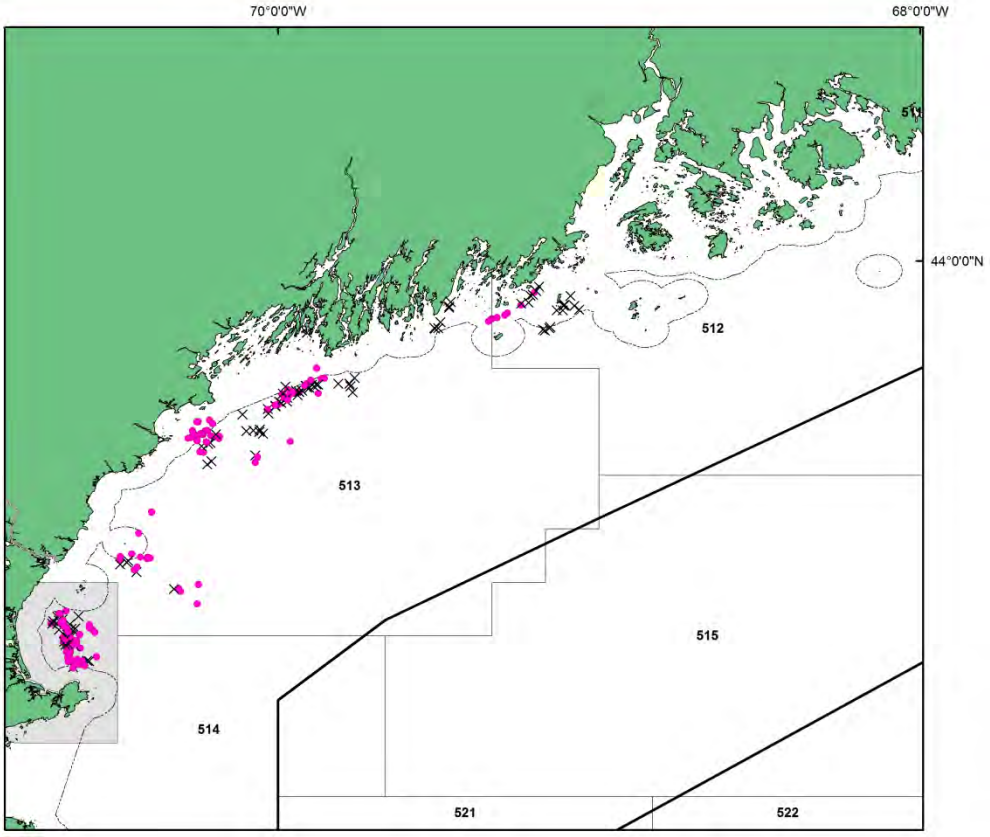


Figure 2: The starting location of observed Northern shrimp fishing activity from January-February, showing presence (circles) and absence (x') of river herring bycatch within an observed haul, overlapped with the river herring monitoring/avoidance area for January- February (gray box/ Ipswich Bay). There are no overlapping river herring protection areas. Source NEFOP 2005-2010.

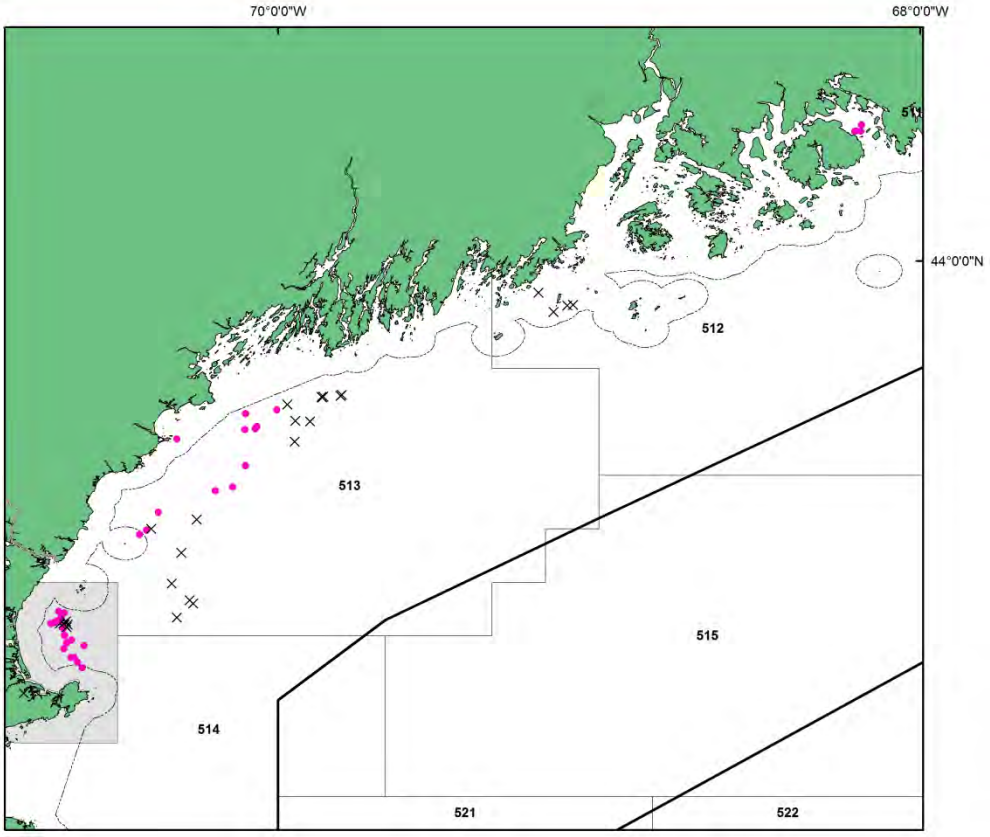


Figure 3: The starting location of observed Northern shrimp fishing activity from March-April, showing presence (circles) and absence (x') of river herring bycatch within an observed haul, overlapped with the river herring bycatch monitoring/avoidance area for March-April (gray box/Ipswich Bay). There are no overlapping river herring protection areas. Source NEFOP 2005-2010.

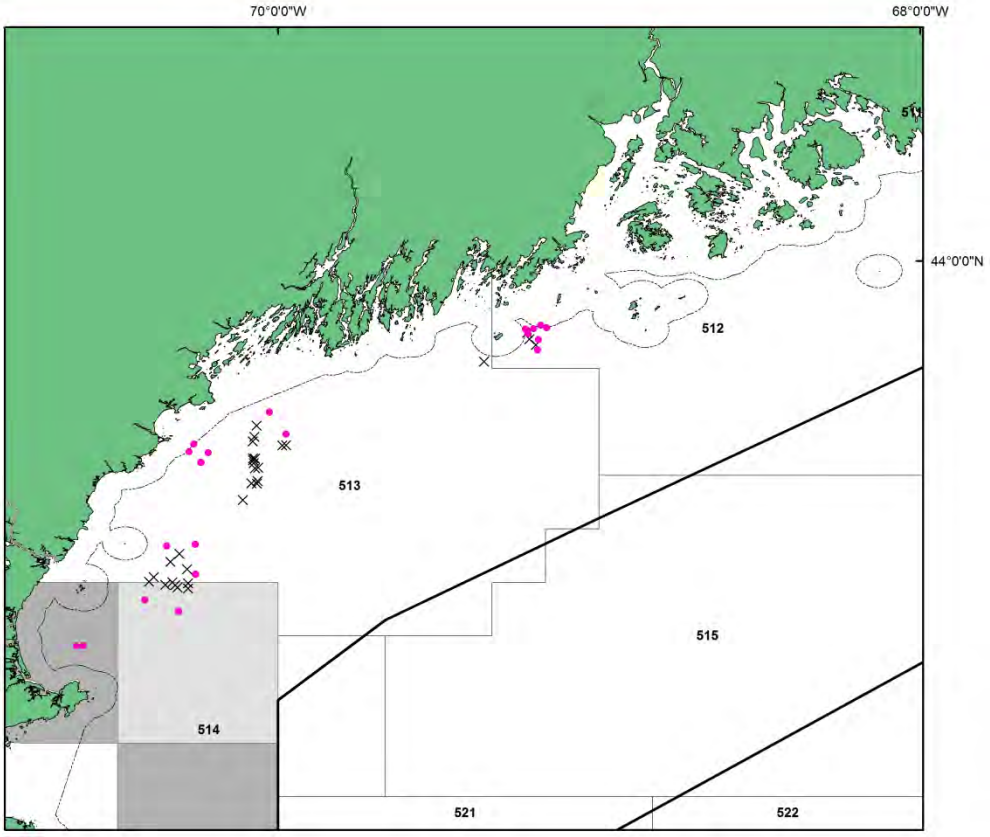


Figure 4: The starting location of observed Northern shrimp fishing activity from November-December showing presence (circles) and absence (x') of river herring bycatch within an observed haul, overlapped with the river herring bycatch monitoring/avoidance areas (light and dark gray boxes) and overlapping river herring protection areas (dark gray boxes) for November-December. Source NEFOP 2005-2010.

Detailed Analysis of Impacts of Management Measures Under Consideration in Amendment 5 to Address River Herring Bycatch

This document provides a detailed technical analysis and assessment of the potential impacts of the management alternatives under consideration in Amendment 5 to address river herring bycatch. Section 5.4 of the Amendment 5 EIS (Volume I) provides a thorough assessment of the impacts of the measures under consideration on each of the five valued ecosystem components (VECs) in Amendment 5 and evaluates the impacts of the options under consideration relative to each other and relative to the no action alternative. This document is intended to supplement the discussion in Section 5.4 and provides the technical details associated with the modeling and analyses conducted by the Herring PDT. This information forms the basis of the discussion presented in Section 5.4 and is incorporated into the Amendment 5 Draft EIS by reference.

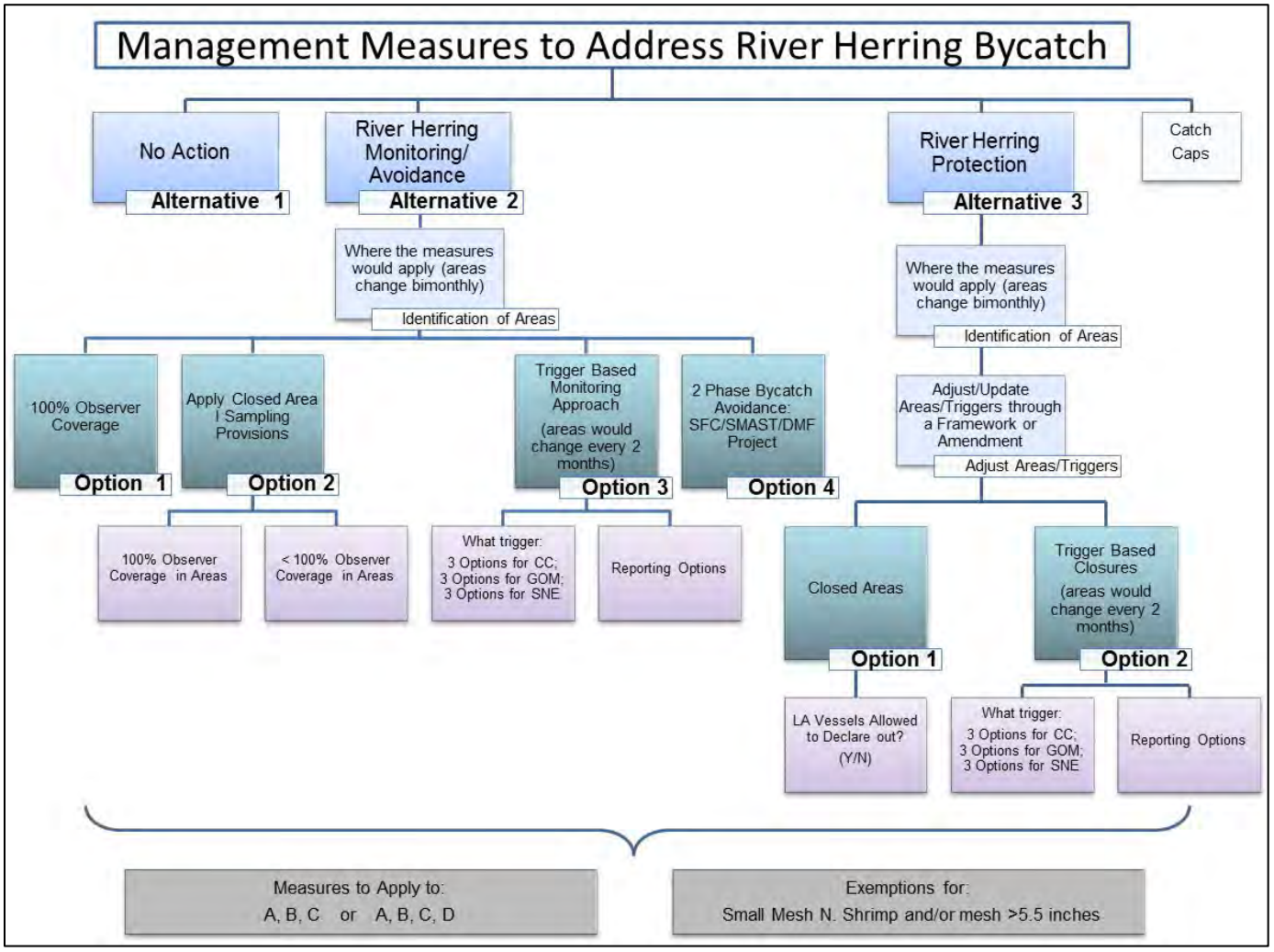
1.0 BACKGROUND

1.1 ALTERNATIVES UNDER CONSIDERATION

- **Alternative 1: No Action (Status Quo, no additional measures to address river herring bycatch in Amendment 5)**
- **Alternative 2: River Herring Monitoring/Avoidance**
    - Establishment of River Herring Monitoring/Avoidance Areas
    - **Option 1:** 100% Observer Coverage in RH Monitoring/Avoidance Areas with sub-options for vessels to which the option applies
    - **Option 2:** Closed Area I Sampling Provisions in RH Monitoring/Avoidance Areas with sub-options for 100% observer coverage or less than 100% coverage, and sub-options for vessels to which the option applies
    - **Option 3:** Trigger-Based Monitoring with sub-options for RH catch triggers and related catch reporting requirements (either Option 1 or Option 2 would apply if/when trigger is reached)
    - **Option 4:**Two-Phase Bycatch Avoidance Approach Based on SFC/SMAST/DMF Project (Phase I in Amendment 5 establishes areas, works with industry to obtain more information, and establishes a mechanism for implementing bycatch avoidance strategies, if appropriate, after the project is completed; Phase II requires a follow-up meeting and determination of appropriate action after the project is completed)
- **Alternative 3: River Herring Protection**
    - Establishment of River Herring Protection Areas
    - **Option 1:** Closed Areas for A/B/C/D permit holders fishing with mesh smaller than 5.5 inches with a sub-option for limited access herring vessels to declare out of the fishery for a period of time
    - **Option 2:** Trigger-Based Protection Areas with sub-options for RH catch triggers and related catch reporting requirements (Protection Areas would be implemented if/when trigger is reached)
- **Mechanism for Adjusting/Updating River Herring Areas/Triggers**

- **River Herring Catch Caps** (mechanism to implement catch caps through a framework adjustment or the specifications process, following completion of a stock assessment by ASMFC); technical analyses related to river herring catch caps are provided in *Appendix V*; river herring catch caps are therefore not analyzed further in this document.

Figure 1 Summary of Amendment 5 Measures Under Consideration to Address River Herring Bycatch



1.2 RELATIONSHIP TO GOALS AND OBJECTIVES

The management measures under consideration in Amendment 5 to address river herring bycatch relate to the overall goal of Amendment 5: - to develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These measures also directly address the first three objectives of Amendment 5: (1) to implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery; (2) to implement other management measures as necessary to ensure compliance with the MSA; and (3) to implement management measures to address bycatch in the Atlantic herring fishery.

Some of the measures under consideration to address river herring bycatch are likely to improve catch monitoring across the herring fishery and particularly in areas where river herring encounters may be expected and may therefore address the more specific goals and objectives of the Amendment 5 catch monitoring program. Moreover, the measures under consideration directly address MSA National Standard 9 (bycatch) – *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.*

1.3 COINCIDENCE OF RIVER HERRING AND SHAD

Much work has been done to evaluate and minimize the impact of the Atlantic herring fishery on river herring species. There has been comparatively little discussion about the impact upon shad species. Since shad and river herring are closely related and share similar life histories, the question has arisen as to whether management measures enacted to protect river herring might also extend substantial protection to shad.

For the purposes of the analysis within this sub-section, American shad (*Alosa sapidissima*) and hickory shad (*Alosa mediocris*) were grouped together as "shad" and alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) were grouped together as "river herring."

To evaluate the coincidence of shad and river herring in bycatch from the Atlantic herring fishery, bycatch estimates from NEFOP observed trips that landed over 2000 pounds of Atlantic herring from 2005 to 2009 were examined. Of the 1,099 individual hauls that were observed, 287 (26%) encountered river herring and 102 (9%) encountered shad (Table 1). Almost two-thirds of the hauls that caught shad also caught river herring, and over 80% of the shad catch came from hauls that also caught river herring (Table 2). The level of coincidence between the two species groups is even greater when the spatial distribution of bycatch events is considered. Only 4% of the ten-minute squares with observed tows had shad bycatch and no river herring bycatch (Table 3, Figure 2, Figure 3, Figure 4). Furthermore, the shad caught from those areas only account for 1% of the total shad bycatch. Therefore, it appears safe to assume that area-based management actions designed to protect river herring will likely also protect shad.

Table 1 Numbers of NEFOP Observed Hauls with River Herring (RHERR) and/or Shad on Trips that Landed Over 2,000 lbs. of Atlantic Herring, 2005-2009

	Bottom Trawl	Midwater Trawl	Purse Seine	Total
total observed hauls	169	768	162	1,099
hauls with RHERR	102	178	7	287
hauls with SHAD	17	84	1	102
hauls with both RHERR and SHAD	8	57	1	66
hauls with SHAD, but no RHERR	9	27	-	36

Source: MA DMF

Table 2 Estimated River Herring (RHERR) and Shad Bycatch from NEFOP Observed Trips that Landed over 2,000 lbs. of Atlantic Herring, 2005-2009

Estimated Bycatch (pounds)	Bottom Trawl	Midwater Trawl	Purse Seine	Total
total RHERR bycatch	44,319	540,771	1,041	586,131
total SHAD bycatch	1,974	45,587	128	47,689
total SHAD from hauls with no RHERR	1,165	6,790	-	7,955

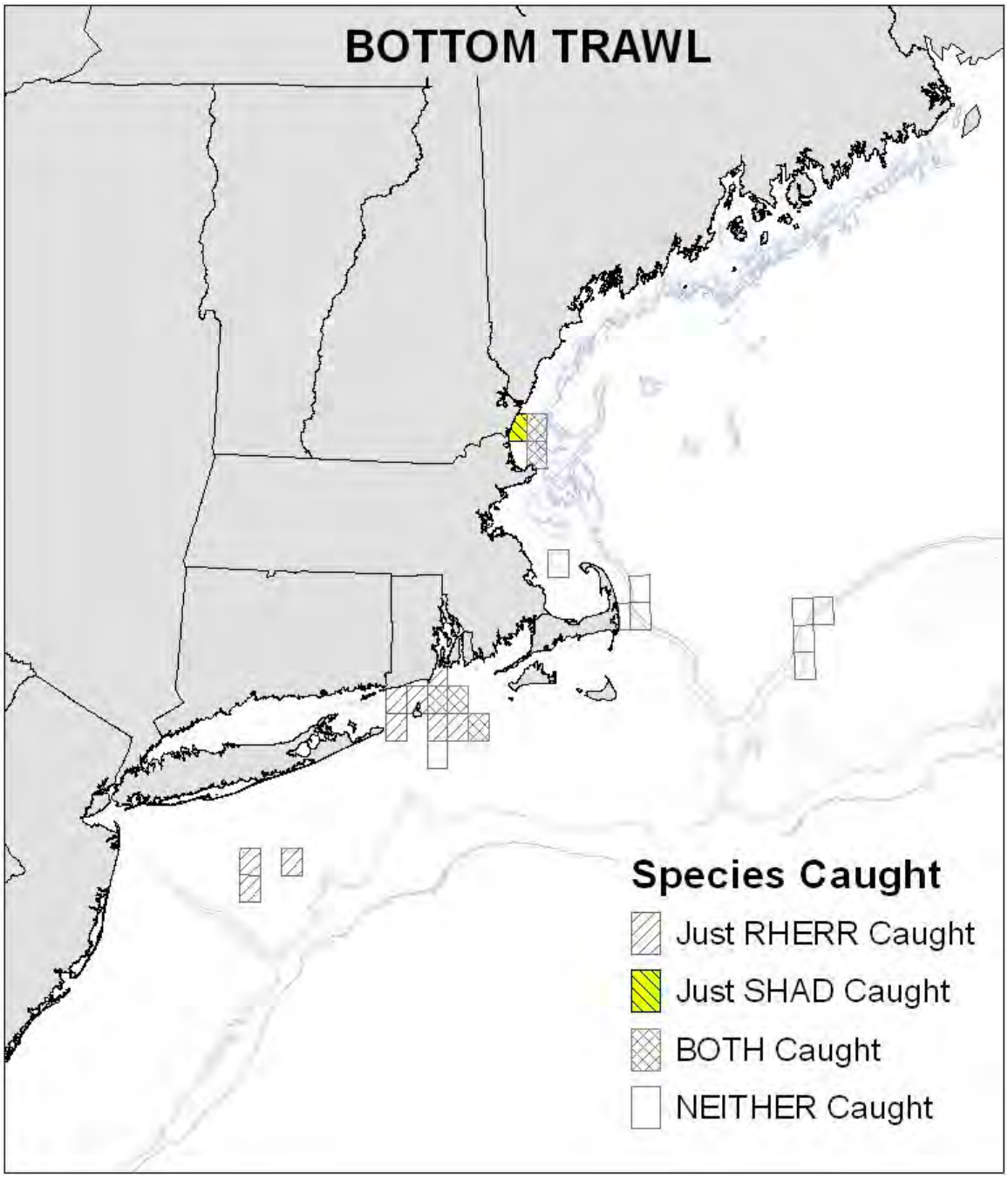
Source: MA DMF

Table 3 Numbers of 10-Minute Squares with Observed Hauls that Encountered Shad, but Not River Herring (RHERR)

	Bottom Trawl	Midwater Trawl	Purse Seine	Total
10-min squares with observed hauls	24	175	29	194
10-min squares with SHAD but no RHERR	1	6	0	7
Shad bycatch (lbs.) from 10-min squares with no RHERR	300	222	0	522

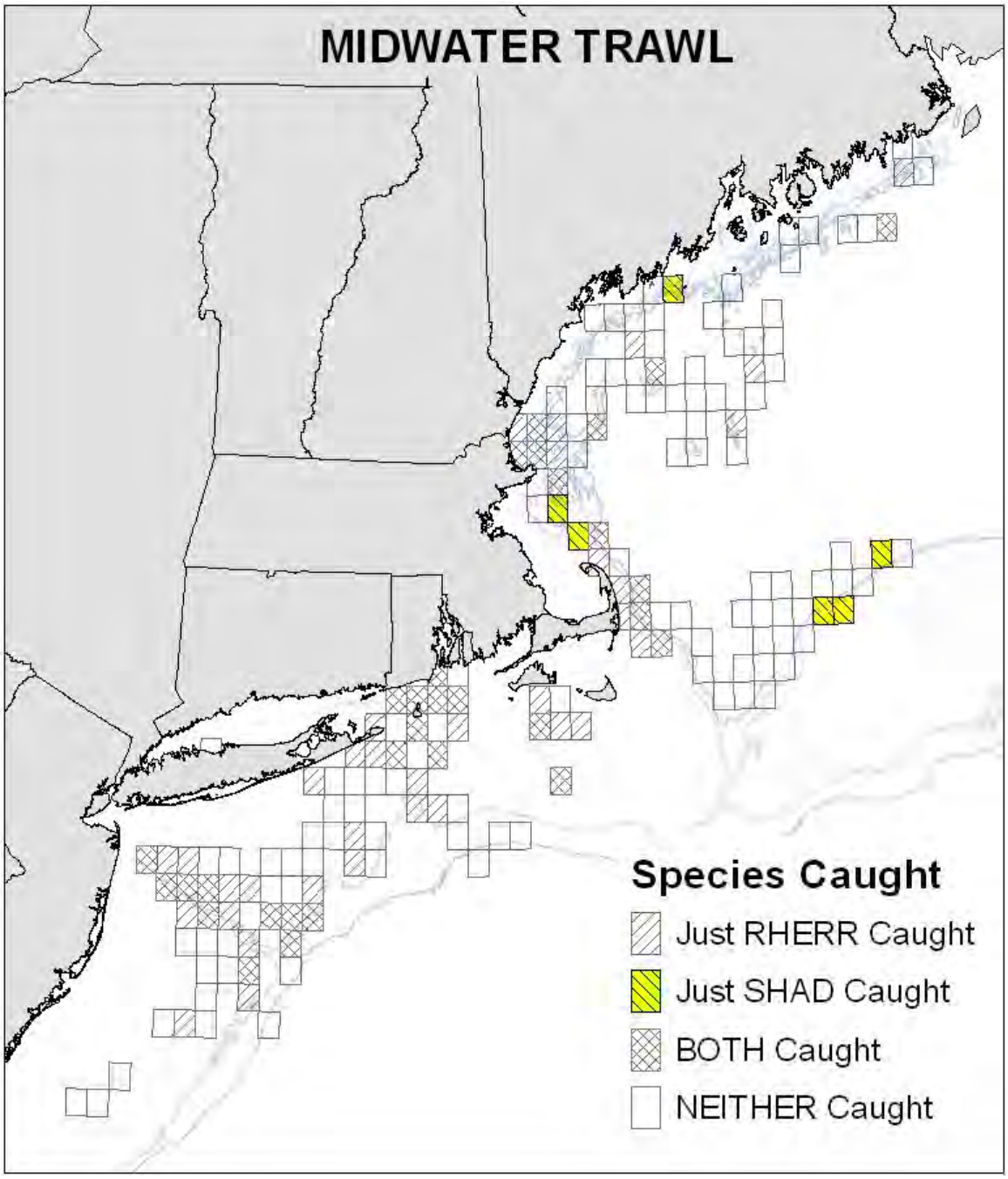
Source: MA DMF

Figure 2 Map of Overlap of Species Caught (Shad and River Herring) by Bottom Trawl Vessel



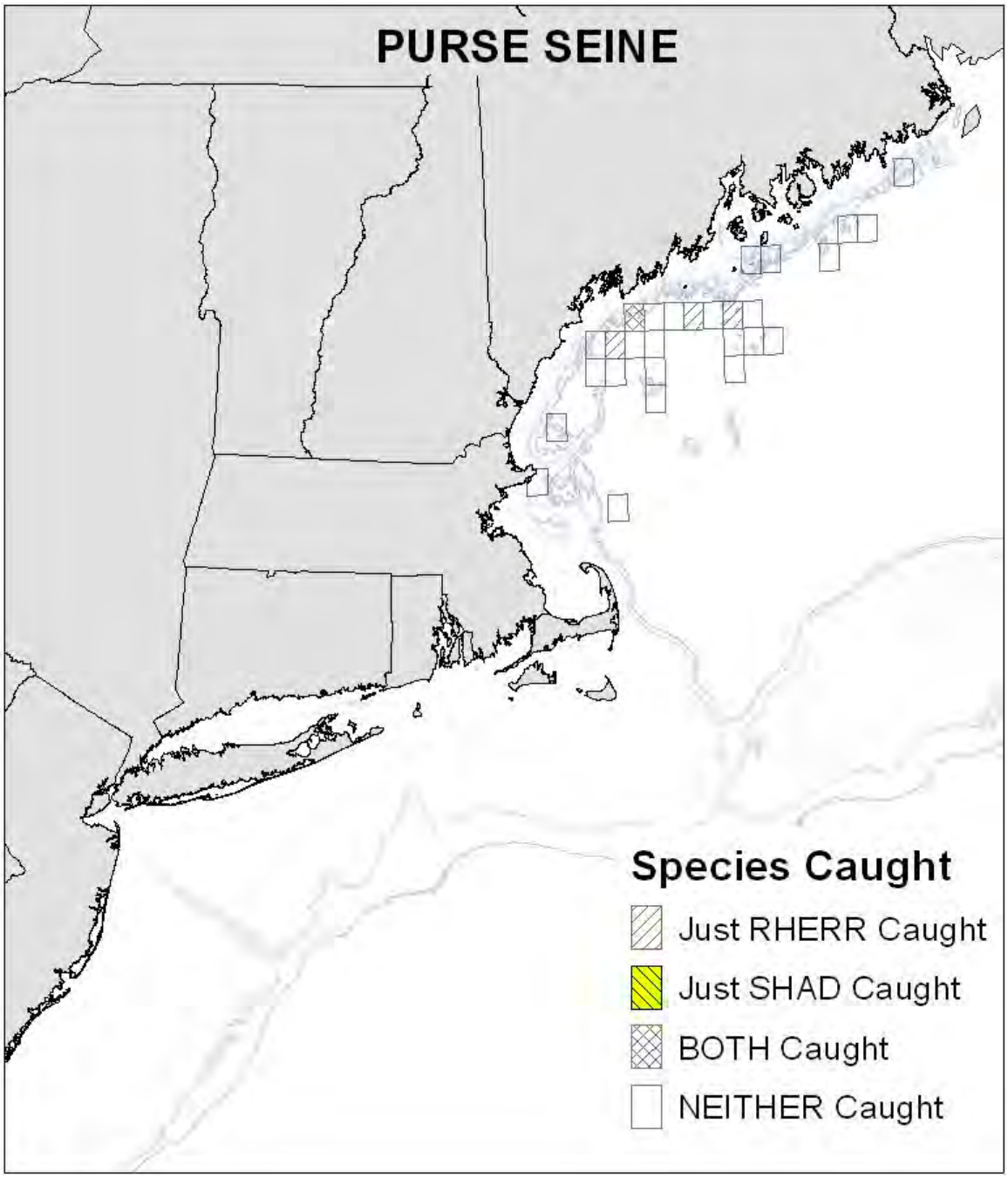
Source: MA DMF

Figure 3 Map of Overlap of Species Caught (shad and river herring) by Midwater Trawl Vessels



Source: MA DMF

Figure 4 Map of Overlap of Species Caught (shad and river herring) by Bottom Trawl Gear



Source: MA DMF

2.0 RIVER HERRING CATCH COMPARISON

To place the most recent (2010) Atlantic herring fishery river herring catch estimate into perspective, a catch estimate comparison was completed. This included summarizing all available published and unpublished studies on at-sea river herring catch (Table 4). Reported river herring catch estimates included data from 1989-2010, although estimates for the directed Atlantic herring fishery were not available for all years. Each study had a different purpose, stratification, and estimation method that should be considered when comparing across different studies. Notably, some studies used kept river herring catch, discarded river herring catch, or both kept and discarded river herring catch in their estimates.

Table 6 compares the most recent estimated river herring catch by the directed Atlantic herring fishery (165,915 lbs.) to that estimated for all at-sea fleets (531,314 lbs.) and the directed in-river fishery for alewife in Maine (1,342,293 lbs.). However, reviewing estimates from years prior to 2010, at-sea river herring catch estimates are highly variable year-to-year as well as associated CVs (Table 4 and Table 5). For example, estimated river herring catch across all at-sea fleets was as a high of 3.6 million lbs. in 1997 for estimates from 1989-2010 (Table 5, Hendrickson and Curti 2011). While estimated river herring catch in the directed Atlantic herring fishery was a high of 1.9 mil lbs. in 2007, for estimates from 2005-2010 (Table 5, Cournane et al. 2010, Cieri 2011).

Table 4 Comparison of Research Studies Estimating At-Sea River Herring Catch

Reference	Catch Type	Years	Management	Fishery	Data Sources	Gear Types	Strata	Sampling Unit	Approach	Ratio
Harrington et al. 2005	K, D	2000, 2003		AH listed as a target species	NEFMC, ASMFC, NMFS herring stock assessment and fishery reports, NEFSC commercial landings, NEFOP	mid-water trawl (single and paired), purse seine	gear, year, species	trips	Extrapolation using discards to landings ratio and the reported level of landings	$D_{ALE\ or\ BBH}/L_{AH}$; $K_{ALE\ or\ BBH}/L_{AH}$
Cieri et al. 2008	K + D	2005-2007	ASMFC RH and Shad FMP A2; NEFMC AH FMP A5	Directed AH fishery, trips with > 2,000 lbs of herring kept or landed	NEFOP, State Portside Sampling Programs (MA, ME)	single midwater trawl, paired midwater trawl , purse seine, bottom-trawl	gear, year, area, quarter	trips	Extrapolation from observer ratio to portside landings	$(D_{RH} + K_{RH})/L_{AH}$
Wigley et al. 2009	D	June 2008-July 2009	SBRM	22 fleets with RH discards	NEFOP, VTR, NEFSC commercial landings database, NOAA MRIP	longline, otter trawl, shrimp trawl, scallop trawl, gillnet, purse seine, scallop dredge, midwater trawl (single and paired), traps	quarter, region, gear type, mesh, access area, and trip category	trips	Estimated discard rate of each fleet multiplied by the corresponding fleet landings in the VTR database, and then summing over fleets	$D_{RH}/K_{all\ species}$
Cournane et al. 2010	K + D	2005-2009	NEFMC AH FMP A5	Directed AH fishery, trips with > 2,000 lbs of herring kept or landed	NEFOP, VTR	midwater trawl (single and paired), purse seine, bottom-trawl	gear, year (and half year), area, quarter	trips	Extrapolation from observer ratio to landings; mean discard rate to landings	$(D_{RH} + Kept_{RH})/L_{AH}$; mean RH /trip * L_{AH}
Lessard and Bryan 2011	K + D	2000-2008		All fisheries with RH and shad catch	NEFOP, VTR	purse seine, midwater trawl (paired and single), bottom-trawl, longline, gillnet, scallop dredge	region, gear, year, species	hauls	Strata specific NEFOP CPUE extrapolated to strata specific VTR hauls	CPUE * hauls
Hendrickson and Curti 2011	K + D	1989-2010	MAFMC SMB FMP A14	All fisheries with RH and shad catch	NEFOP, VTR, NEFSC commercial landings database	Multiple	quarter, region, gear type, mesh	trips	combined ratio method	$(D_{RH} + K_{RH})/K_{all\ species}$
Cieri 2011	K + D	2010	NEFMC AH FMP A5	Declared into AH fishery	NEFOP, VTR, VMS, NEFSC commerical landings database	midwater trawl (single and paired), purse seine, bottom-trawl				

Table 5 At-Sea River Herring Catch Estimated in Research Studies (see Table 4)

Authors	Year	Gear(s)	Catch Type	Species	Catch	Unit	Catch (lbs)	CV	Reference Table
Harrington et al. 2005	2000	midwater trawl	D	ALE	0.004	mt	8.82	-	Table 45, pp.88
Harrington et al. 2005	2003	midwater trawl	D	ALE	0.003	mt	6.61	-	Table 45, pp.88
Harrington et al. 2005	2000	midwater trawl	K	ALE	529.508	mt	1,167,353.34	-	Table 45, pp.88
Harrington et al. 2005	2003	midwater trawl	K	ALE	361.124	mt	796,133.97	-	Table 45, pp.88
Harrington et al. 2005	2000	midwater trawl	K	BBH	28.822	mt	63,540.98	-	Table 45, pp.88
Harrington et al. 2005	2003	midwater trawl	K	BBH	19.657	mt	43,335.82	-	Table 45, pp.88
Harrington et al. 2005	2003	paired midwater trawl	D	ALE	0.86	mt	1,895.96	-	Table 47, pp.89
Harrington et al. 2005	2003	paired midwater trawl	K	ALE	157.59	mt	347,422.91	-	Table 47, pp.89
Cieri et al. 2008	2005	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	285,833	lbs	285,833.00	0.60	Table 2, pp. 10
Cieri et al. 2008	2006	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	171,973	lbs	171,973.00	0.60	Table 2, pp. 10
Cieri et al. 2008	2007	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	1,686,617	lbs	1,686,617.00	0.50	Table 2, pp. 10
Wigley et al. 2009	July 2008-June 2009	shrimp trawl, otter trawl, midwater trawl (single and paired)	D	RH	106,455	lbs	106,455.00	1.49	Table 4, pp. 11
Cournane et al. 2010	2005	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	358,600	lbs	358,600.00	given by sub-area	Table 4, pp. 9
Cournane et al. 2010	2006	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	369,000	lbs	369,000.00	given by sub-area	Table 4, pp. 9
Cournane et al. 2010	2007	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	1,908,800	lbs	1,908,800.00	given by sub-area	Table 4, pp. 9
Cournane et al. 2010	2008	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	972,400	lbs	972,400.00	given by sub-area	Table 4, pp. 9
Cournane et al. 2010	2009	midwater trawl (single and paired), purse seine, bottom-trawl	K + D	RH	766,900	lbs	766,900.00	given by sub-area	Table 4, pp. 9

Table 5 continued. At-Sea River Herring Catch Estimated in Research Studies (see Table 4)

Authors	Year	Gear(s)	Catch Type	Species	Catch	Unit	Catch (lbs)	CV	Reference Table
Lessard and Bryan 2011	2000	Multiple gears	K + D	ALE	2,414,561	lbs	2,414,561.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2001	Multiple gears	K + D	ALE	1,877,641	lbs	1,877,641.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2002	Multiple gears	K + D	ALE	940,268	lbs	940,268.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2003	Multiple gears	K + D	ALE	1,868,052	lbs	1,868,052.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2004	Multiple gears	K + D	ALE	1,044,672	lbs	1,044,672.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2005	Multiple gears	K + D	ALE	871,127	lbs	871,127.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2006	Multiple gears	K + D	ALE	582,714	lbs	582,714.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2007	Multiple gears	K + D	ALE	3,500,890	lbs	3,500,890.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2008	Multiple gears	K + D	ALE	533,356	lbs	533,356.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2000	Multiple gears	K + D	BBH	2,602,342	lbs	2,602,342.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2001	Multiple gears	K + D	BBH	4,657,281	lbs	4,657,281.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2002	Multiple gears	K + D	BBH	7,126,364	lbs	7,126,364.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2003	Multiple gears	K + D	BBH	1,669,084	lbs	1,669,084.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2004	Multiple gears	K + D	BBH	994,206	lbs	994,206.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2005	Multiple gears	K + D	BBH	548,213	lbs	548,213.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2006	Multiple gears	K + D	BBH	527,426	lbs	527,426.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2007	Multiple gears	K + D	BBH	991,492	lbs	991,492.00	-	Table 5, pp. 36
Lessard and Bryan 2011	2008	Multiple gears	K + D	BBH	2,551,356	lbs	2,551,356.00	-	Table 5, pp. 36

Table 5 continued. At-Sea River Herring Catch Estimated in Research Studies (see Table 4)

Authors	Year	Gear(s)	Catch Type	Species	Catch	Unit	Catch (lbs)	CV	Reference Table
Hendrickson and Curti 2011	1989	Multiple gears	K + D	RH	108	mt	238,096.80	0.30	Table 3, pp. 10
Hendrickson and Curti 2011	1990	Multiple gears	K + D	RH	310	mt	683,426.00	0.46	Table 3, pp. 10
Hendrickson and Curti 2011	1991	Multiple gears	K + D	RH	674	mt	1,485,900.40	0.39	Table 3, pp. 10
Hendrickson and Curti 2011	1992	Multiple gears	K + D	RH	1268	mt	2,795,432.80	0.39	Table 3, pp. 10
Hendrickson and Curti 2011	1993	Multiple gears	K + D	RH	1867	mt	4,115,988.20	1.39	Table 3, pp. 10
Hendrickson and Curti 2011	1994	Multiple gears	K + D	RH	134	mt	295,416.40	0.32	Table 3, pp.10
Hendrickson and Curti 2011	1995	Multiple gears	K + D	RH	301	mt	663,584.60	0.4	Table 3, pp. 10
Hendrickson and Curti 2011	1996	Multiple gears	K + D	RH	1613	mt	3,556,019.80	2.59	Table 3, pp. 10
Hendrickson and Curti 2011	1997	Multiple gears	K + D	RH	1633	mt	3,600,111.80	0.71	Table 3, pp. 10
Hendrickson and Curti 2011	1998	Multiple gears	K + D	RH	220	mt	485,012.00	0.93	Table 3, pp. 10
Hendrickson and Curti 2011	1999	Multiple gears	K + D	RH	320	mt	705,472.00	0.68	Table 3, pp. 10
Hendrickson and Curti 2011	2000	Multiple gears	K + D	RH	170	mt	374,782.00	0.47	Table 3, pp. 10
Hendrickson and Curti 2011	2001	Multiple gears	K + D	RH	694	mt	1,529,992.40	0.45	Table 3, pp. 10
Hendrickson and Curti 2011	2002	Multiple gears	K + D	RH	314	mt	692,244.40	0.29	Table 3, pp. 10
Hendrickson and Curti 2011	2003	Multiple gears	K + D	RH	305	mt	672,403.00	0.40	Table 3, pp. 10
Hendrickson and Curti 2011	2004	Multiple gears	K + D	RH	193	mt	425,487.80	0.50	Table 3, pp. 10
Hendrickson and Curti 2011	2005	Multiple gears	K + D	RH	600	mt	1,322,760.00	0.32	Table 3, pp. 10
Hendrickson and Curti 2011	2006	Multiple gears	K + D	RH	456	mt	1,005,297.60	0.59	Table 3, pp. 10
Hendrickson and Curti 2011	2007	Multiple gears	K + D	RH	607	mt	1,338,192.20	0.91	Table 3, pp. 10
Hendrickson and Curti 2011	2008	Multiple gears	K + D	RH	504	mt	1,111,118.40	0.41	Table 3, pp. 10
Hendrickson and Curti 2011	2009	Multiple gears	K + D	RH	364	mt	802,474.40	0.21	Table 3, pp. 10
Hendrickson and Curti 2011	2010	Multiple gears	K + D	RH	241	mt	531,308.60	0.14	Table 3, pp. 10
Cieri 2011	2010	Midwater trawls (single and paired), purse seine	K + D	RH	165,915	lbs	165,915.00	given by sub-area	Table 142, DEIS

Table 6 River Herring Catch Comparison for 2010 Data

Fishery	2010 River Herring Catch Catch (lbs.)		Source
Maine Directed Alewife Landings	1,342,293		Maine DMR
All Fleets (estimated)	531,314	*	NEFSC
Directed Herring Fleet (estimated)	165,915	**	Herring PDT

* High of 3.6 mil lbs. in 1997 (1989-2010)

** High of 1.9 mil lbs. in 2007 (2005-2010)

3.0 SUMMARY OF RIVER HERRING AT-SEA MIGRATORY PATTERNS

In general, river herring at-sea seasonal migratory patterns are reflected using the Herring PDT's hotspot analysis of survey data. Table 7 summarizes the results of the river herring hotspot analysis to identify survey-based areas. River herring travel from southern to northern latitudes from winter through fall, presumably due to temperature fluctuations and timing of in-river spawning, then returning to southern latitudes to overwinter. River herring were relatively more likely to be encountered in the winter in Southern New England waters and the Northern Mid-Atlantic Bight and in the spring in the Gulf of Maine, Southern New England waters, and the Northern Mid-Atlantic Bight. In addition, the winter survey did not operate in the more northern latitudes and the summer survey provided a limited number of observation years. Additional information/analyses provided by the Herring PDT can be found in Volume II, *Appendix III* (Herring PDT Analysis: Development of Measures to Address River Herring Bycatch).

Table 7 Summary of Seasonal River Herring Hotspot Analysis Using NMFS Bottom Trawl Surveys

For each identified season and region combination, the relative likelihood of encountering river herring is summarized by shading in the table (see footnotes).

	Season			
Region	Winter	Spring	Summer	Fall
Scotian Shelf	*		*	
Bay of Fundy	*		*	
Gulf of Maine	*			
Georges Bank				
Southern New England				
Northern Mid-Atlantic Bight				

"*" indicates limited data

Relative likelihood of encountering river herring in hotspots scaled using ranked percent occurrence:

> or = 67% (dark gray), < 67% (light gray), and mixed results (medium gray)

4.0 MAPPING FISHING EFFORT AND REVENUES FROM THE 2010 HERRING FISHING YEAR

Analysis of some of the management alternatives under consideration in Amendment 5 to the Herring Fishery Management Plan requires fine scale spatial data. Permanent and triggered spatial closures of small areas (Quarter Degree squares and the groundfish closed areas) are being considered in this Amendment. These areas do not correspond directly to the statistical areas over which catch is reported. This section describes the general procedure by which 2010 fishing effort, catch, and revenues are mapped using the VMS, VTR, dealer, and observer data. The used are similar to those used by Palmer and Wigley (2007).

The revenues derived from the protection and monitoring areas **should not** be interpreted as changes or losses in revenues or profits associated with implementing monitoring or protection areas for river herring. These are provided to give insight into how much of the herring fleet's activity would be impacted by the proposed alternatives.

Rationale

This procedure is used because the management units (quarter degree squares, QDSQ) are small relative to the statistical areas. VTR data is collected at too coarse of a spatial scale to analyze the impacts of these spatial management measures because only a single location is reported per statistical area. While these single data points may be very accurate for vessels using purse seine gear, it is likely to be fairly inaccurate for vessels using trawl gear. This does not imply any misreporting by participants using trawl gear; however, they cover large amounts of area and a single point does not accurately reflect the location of fishing effort.

Observer data is only available for a subsample of fishing effort. VMS data lacks activities, including catch. The goal of this methods is to locate, more precisely, the fishing effort in the directed herring fishery in order to understand the impacts of the management measures under consideration in Amendment 5.

Methods

The observer data were used to build “profiles” of fishing activity. Haul start and end locations were used to construct “distance traveled.” Haul start and end times were used to construct “time elapsed.” From these two pieces of information, a speed profile was constructed for fishing activities for trawl gear. For trawl gear, fishing occurs at speeds below 5 knots (over ground) and typically well below those speeds. These are similar, but not identical to the findings of Palmer and Wigley (2007). It is not possible to build speed profiles for the purse seine fishery – the locations of start and end are typically the same. The same five-knot cutoff is used to classify purse seine fishing activity; however, this is likely to lead to an over-classification of VMS points as “fishing.” For reference, histograms of VMS speeds for trawl vessels and purse seines are shown in Figure 5 and Figure 6.

The VTR data were used to identify “herring trips” by fishing vessels using the criteria that over 2,000 lbs. of herring were landed on a trip. Some of these “herring trips” may be actually be targeted mackerel trips on which herring were caught and landed incidentally. The data were split into three “fleets”: purse seine (all permit categories), trawl (Categories A, B, and C) , and Category D trawl vessels. Herring catch, herring revenues, and total revenues (herring plus other species) for each trip were extracted from VTR and dealer data.

VMS polls corresponding to those trips were extracted. Points were classified as “fishing” or “traveling” based on the speed criteria (5 knots). Points in obvious non-fishing locations, such as the Cape Cod

Canal and Sakonnet River were classified as “traveling” as well. For VMS polls classified as “fishing,” effort (in hours) was defined as the time elapsed since the previous point. Total effort for a trip was constructed as the sum of effort on that trip. Trip-level catch and revenues of herring and revenues from all other species were allocated to each VMS point which as identified as a fishing point based on the relative of total effort. The catch, effort, and revenue data were spatially joined to the QDSQ map and then aggregated to create catch, effort, and revenue data for each QDSQ, for each “fleet” at the bi-monthly level (Table 8 – Table 11).

Caveats

Use of a 2,000 lb. weight limit may misclassify 'non-herring' trips as herring trips, particularly directed mackerel trips as herring trips. This criteria will include “mackerel” trips which landed herring incidentally, but will not include “mackerel” trips which landed less than 2,000 lbs. of herring. This screen also eliminates unsuccessful trips – trips in which vessels searched for, but did not catch and retain more than 2,000 lbs. of herring.

The classification algorithm is likely to over-classify VMS points as fishing for all gear types, but particularly in the purse seine fleet. In particular, “searching” activities, in which vessels travel at moderate speeds while looking for fish, are likely to be classified “fishing.” There are two reasons for choosing to “over-classify” instead of “under-classify” VMS points as fishing activity.

First, vessels should only search in areas which are promising for catching fish. Therefore, the over-classification of points as fishing effort will identify not just actual catch locations, but potential and likely catch locations as well. Second, any points “misclassified” as fishing are likely to be near actual fishing locations. Aggregation to the level of the QDSQ and then allocation of catch over these areas should minimize the effect of these errors.

The 2010 fishing year had less “offshore fishing effort” than previous years. It is difficult to tell if this effort shifted to nearshore areas or left the fishery. Management Area sub-ACLs for the 2010 fishing year are similar to the sub-ACLs which will be in effect in the near future (2011 and 2012).

Perhaps most importantly, this description of the herring fishery does not include any behavioral changes by the fishing fleet in response to changes in incentives. For some of the options under consideration, a behavioral response is possible. For example, if additional observer coverage is funded by NMFS, vessels may call for an observer more frequently in order to preserve the option of fishing in the monitoring areas. However, if additional coverage is funded by industry, vessels may choose to fish outside of the monitoring areas.

General Results

In general, the monitoring areas overlap with the location of the winter/spring trawl fishery (November-April) and portions of the summer inshore purse seine fishery. The protection areas overlap a portion of the winter trawl fishery (Nov-Feb) and will have minimal impacts on the purse seine fishery. There is minimal overlap between the Category D vessels and the monitoring or protection areas (Figure 7 – Figure 27).

Table 8 Fishing Time (Hrs.) by Bimonthly Period for Purse Seines (PUR) and All Trawl Gears (TR) Separated by Permit Category (ABC or D)

		Fishing Time by Bimonthly Period						
Gear	Category	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec	Grand Total
PUR				490	1,213	1,115	129	2,947
TR	ABC	3,440	999	712	2,177	2,414	2,364	12,105
	D		10		200	88		298
Grand Total		3,440	1,009	1,202	3,590	3,617	2,493	15,351

Table 9 Percent Fishing Time by Bimonthly Period for Purse Seines (PUR) and All Trawl Gears (TR) Separated by Permit Category (ABC or D)

		Fishing Time by Bimonthly Period (%)						
Gear	Category	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec	Grand Total
PUR				16.6%	41.1%	37.8%	4.4%	100.0%
TR	ABC	28.4%	8.3%	5.9%	18.0%	19.9%	19.5%	100.0%
	D	0.0%	3.3%		67.1%	29.5%		100.0%
Grand Total		22.4%	6.6%	7.8%	23.4%	23.6%	16.2%	100.0%

Table 10 Herring Catch (Lbs.) by Bimonthly Period for Purse Seines (PUR) and All Trawl Gears (TR) Separated by Permit Category (ABC or D)

		Herring Catch by Bimonthly Period						
Gear	Category	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec	Grand Total
PUR				1,037,950	5,612,589	10,657,575	1,154,427	18,462,541
TR	ABC	23,150,171	8,390,350	10,954,085	19,839,144	27,783,172	33,986,926	124,103,849
	D		6,500		94,100	48,244		148,844
Grand Total		23,150,171	8,396,850	11,992,035	25,545,833	38,488,992	35,141,353	142,715,233

Table 11 Percent Herring Catch by Bimonthly Period For Purse Seines (PUR) and All Trawl Gears (TR) Separated by Permit Category (ABC or D)

		Herring Catch by Bimonthly Period (%)						
Gear	Category	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec	Grand Total
PUR				5.6%	30.4%	57.7%	6.3%	100.0%
TR	ABC	18.7%	6.8%	8.8%	16.0%	22.4%	27.4%	100.0%
	D		4.4%		63.2%	32.4%		100.0%
Grand Total		16.2%	5.9%	8.4%	17.9%	27.0%	24.6%	100.0%

Figure 5 Histogram of VMS Speed (Knots) for Trawl Gears

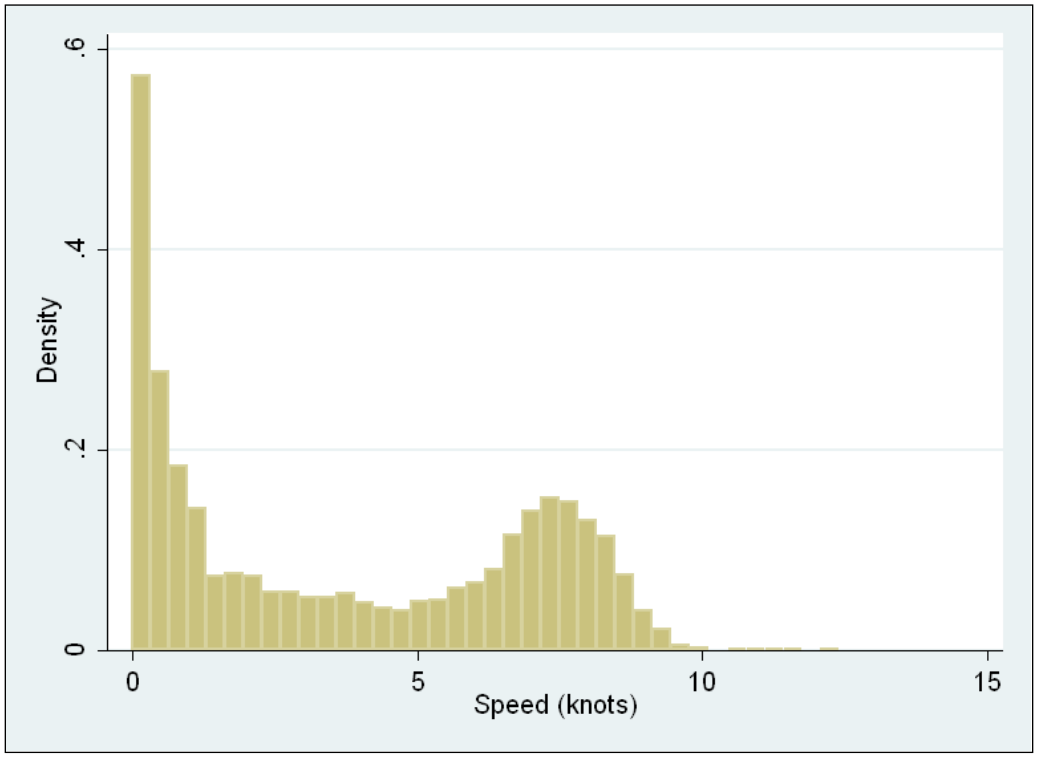


Figure 6 Histogram of VMS Speed (Knots) for Purse Seines

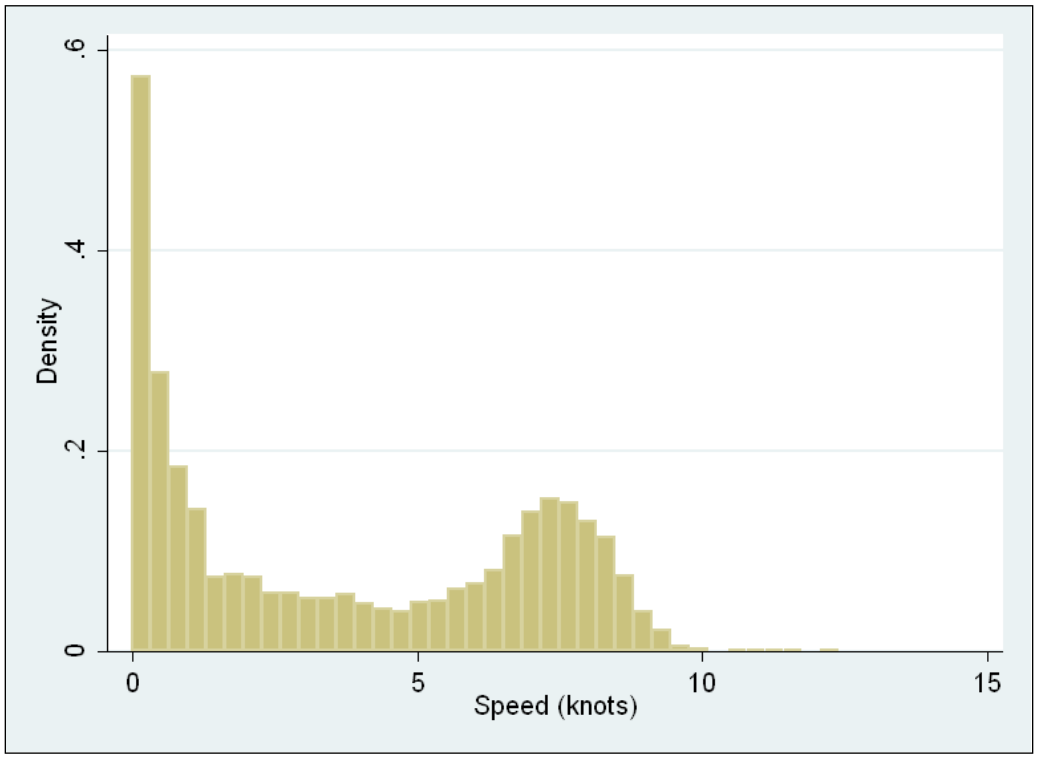


Figure 7 Trawl Effort (ABC only) and Monitoring Areas, January – February

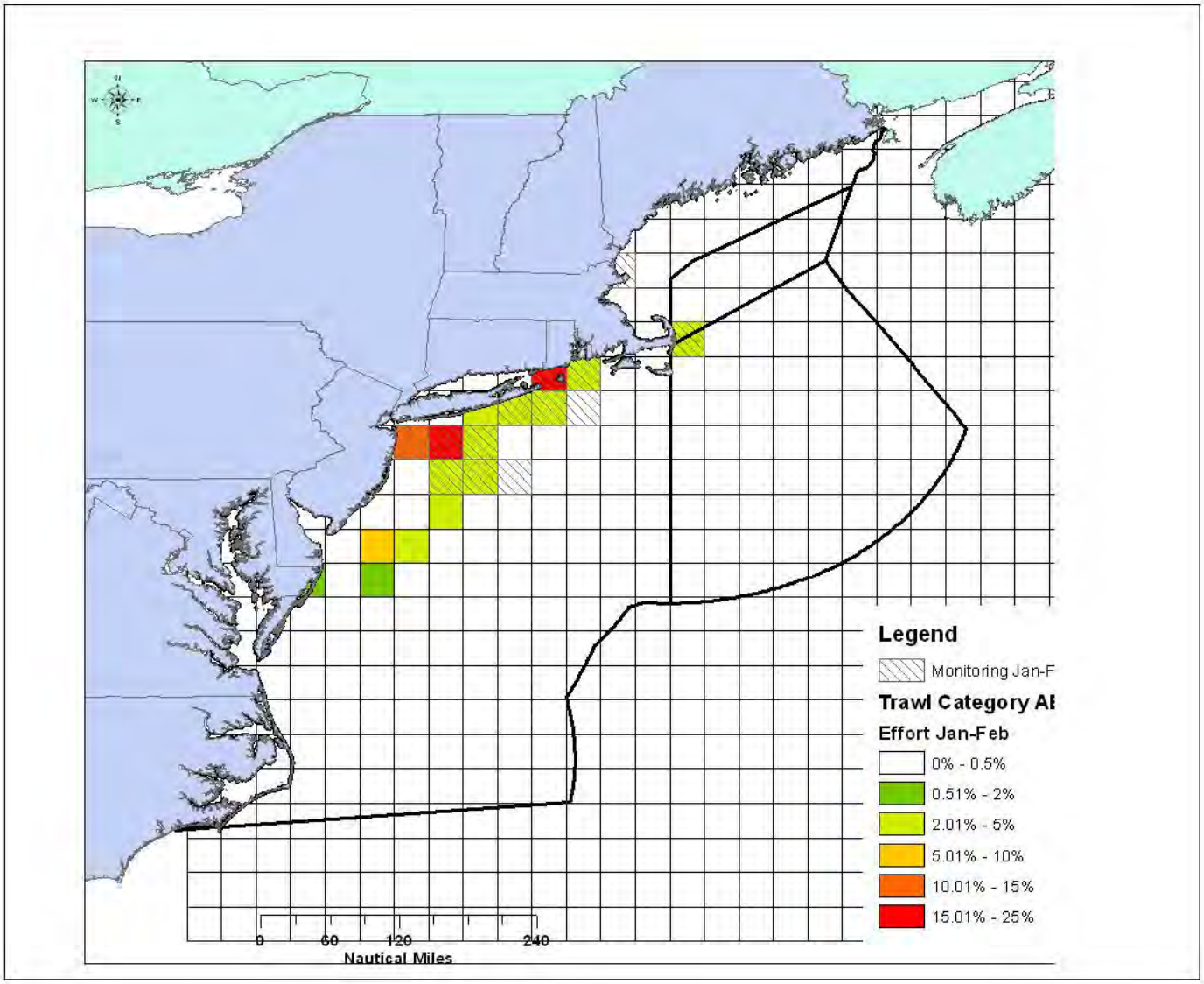


Figure 8 Trawl Effort (ABC only) and Monitoring Areas, March-April

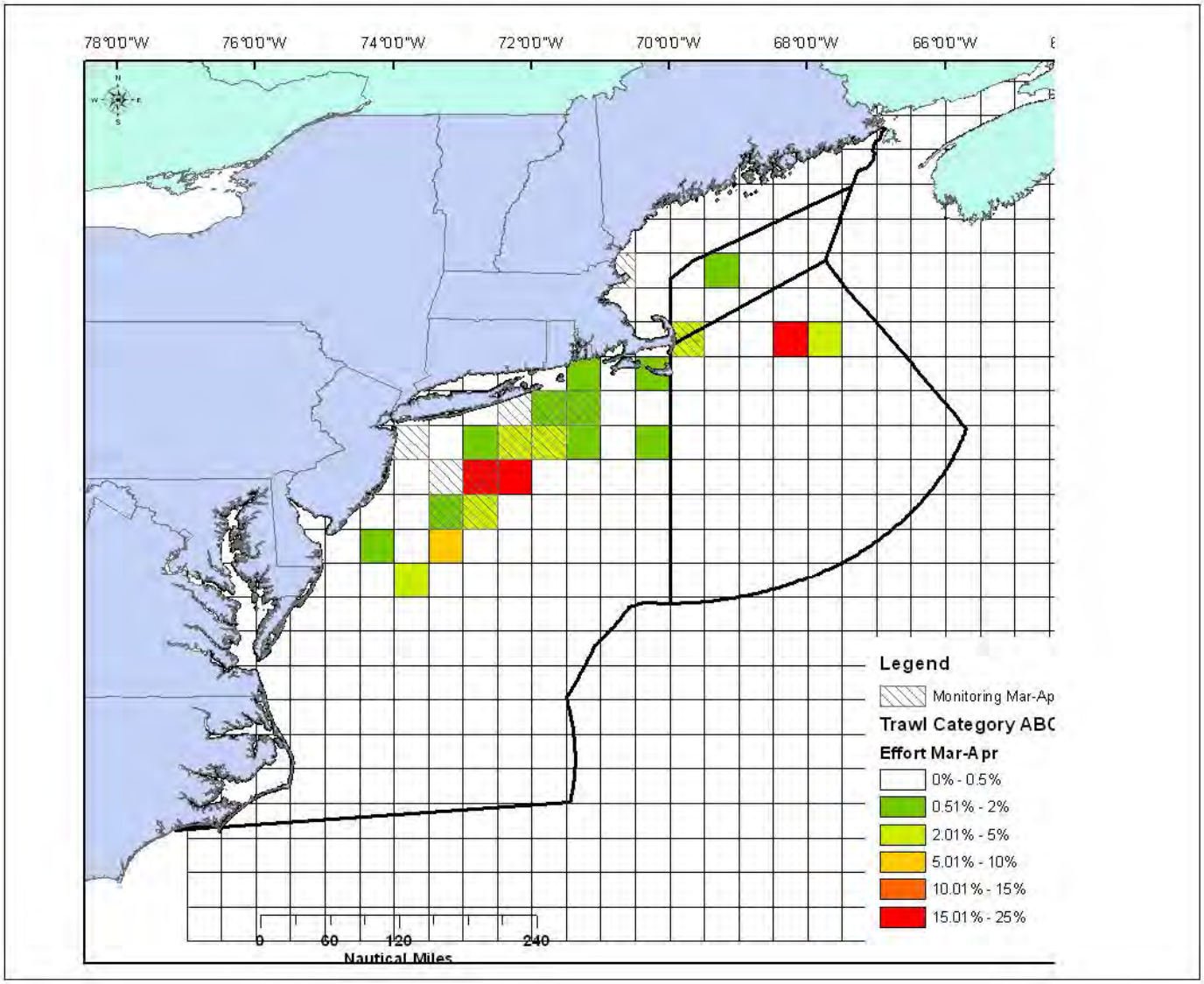


Figure 9 Trawl Effort (ABC only) and Monitoring Areas, May-June

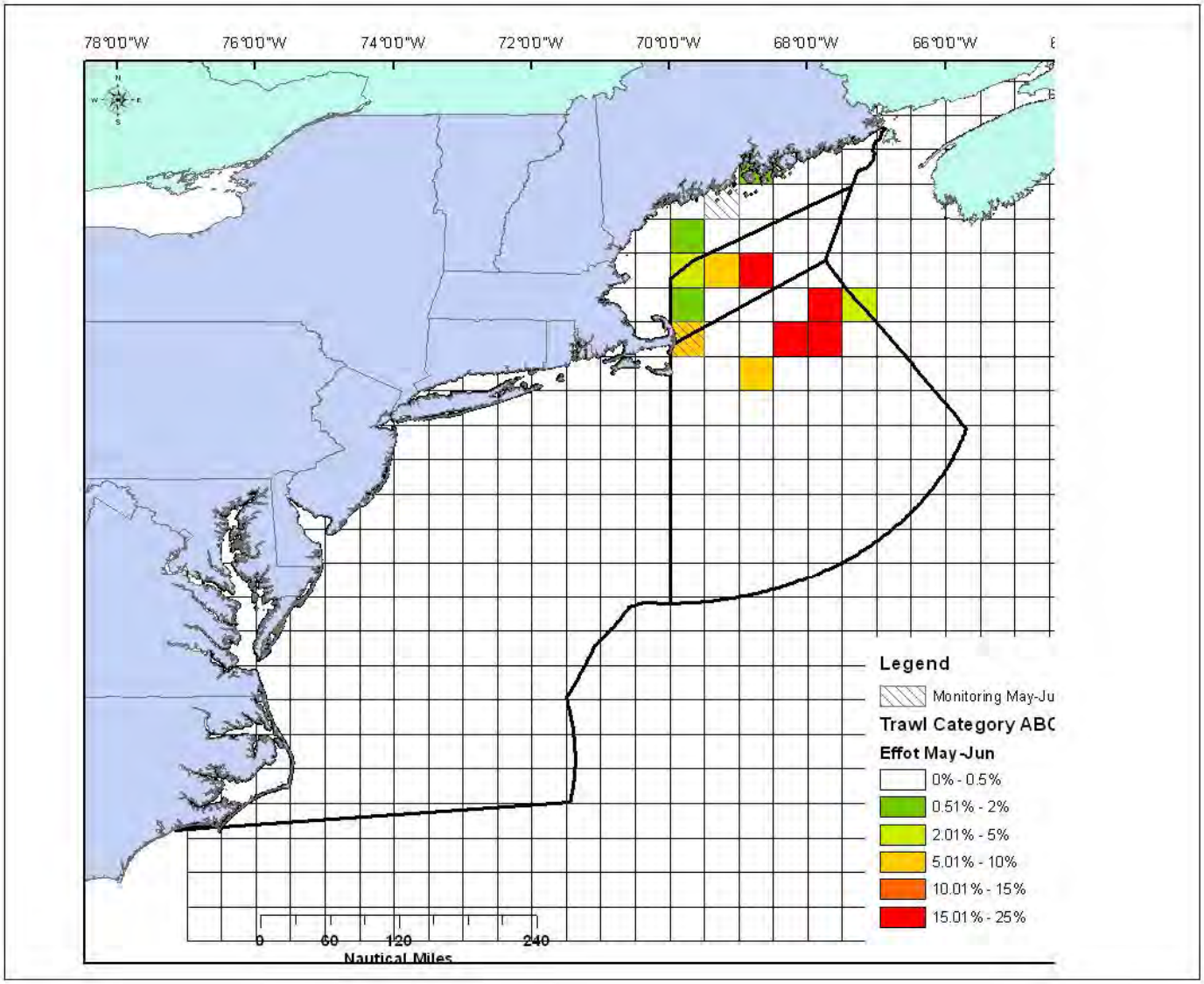


Figure 10 Trawl Effort (ABC only) and Monitoring Areas, July- August

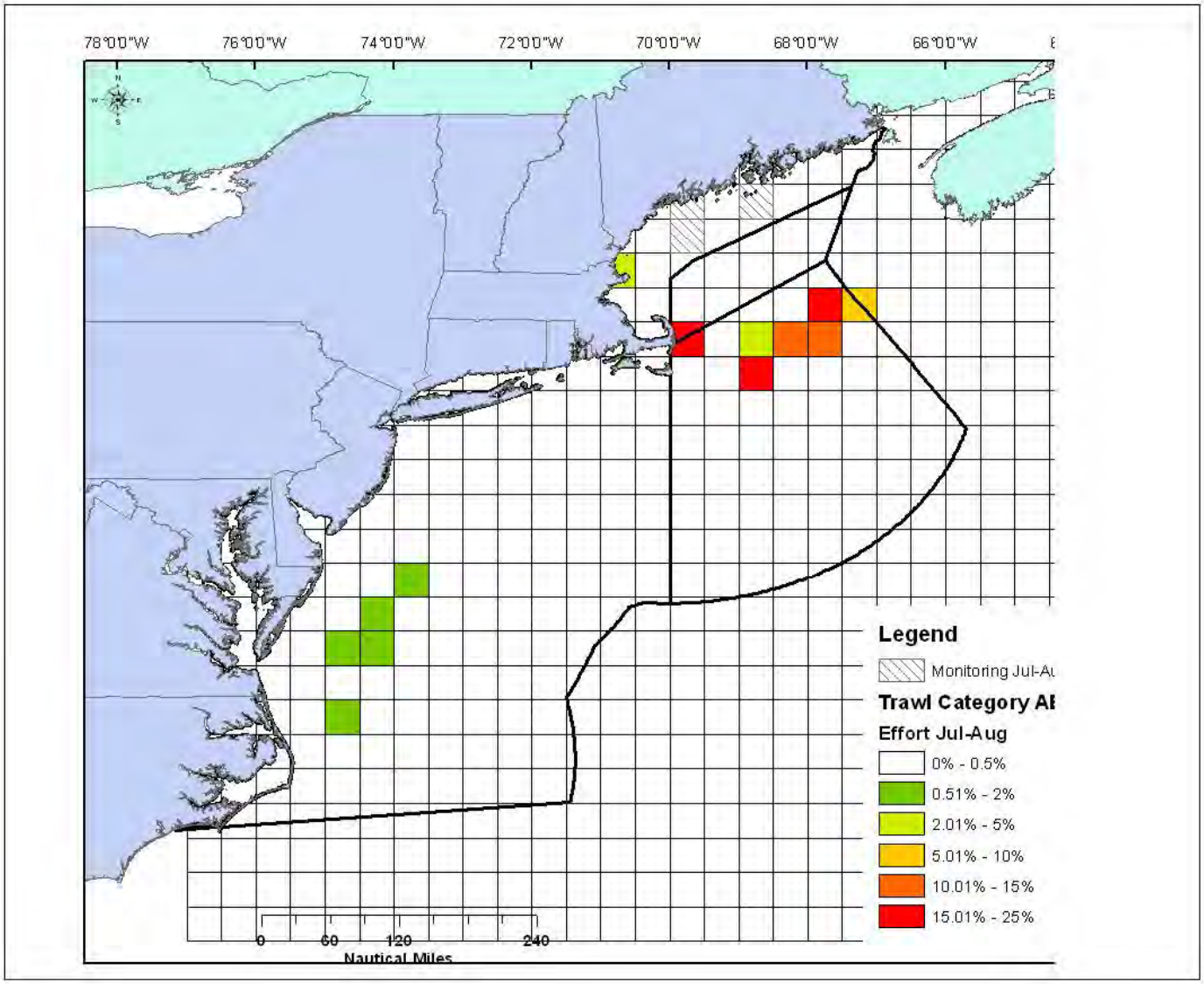


Figure 11 Trawl Effort (ABC only) and Monitoring Areas, September – October

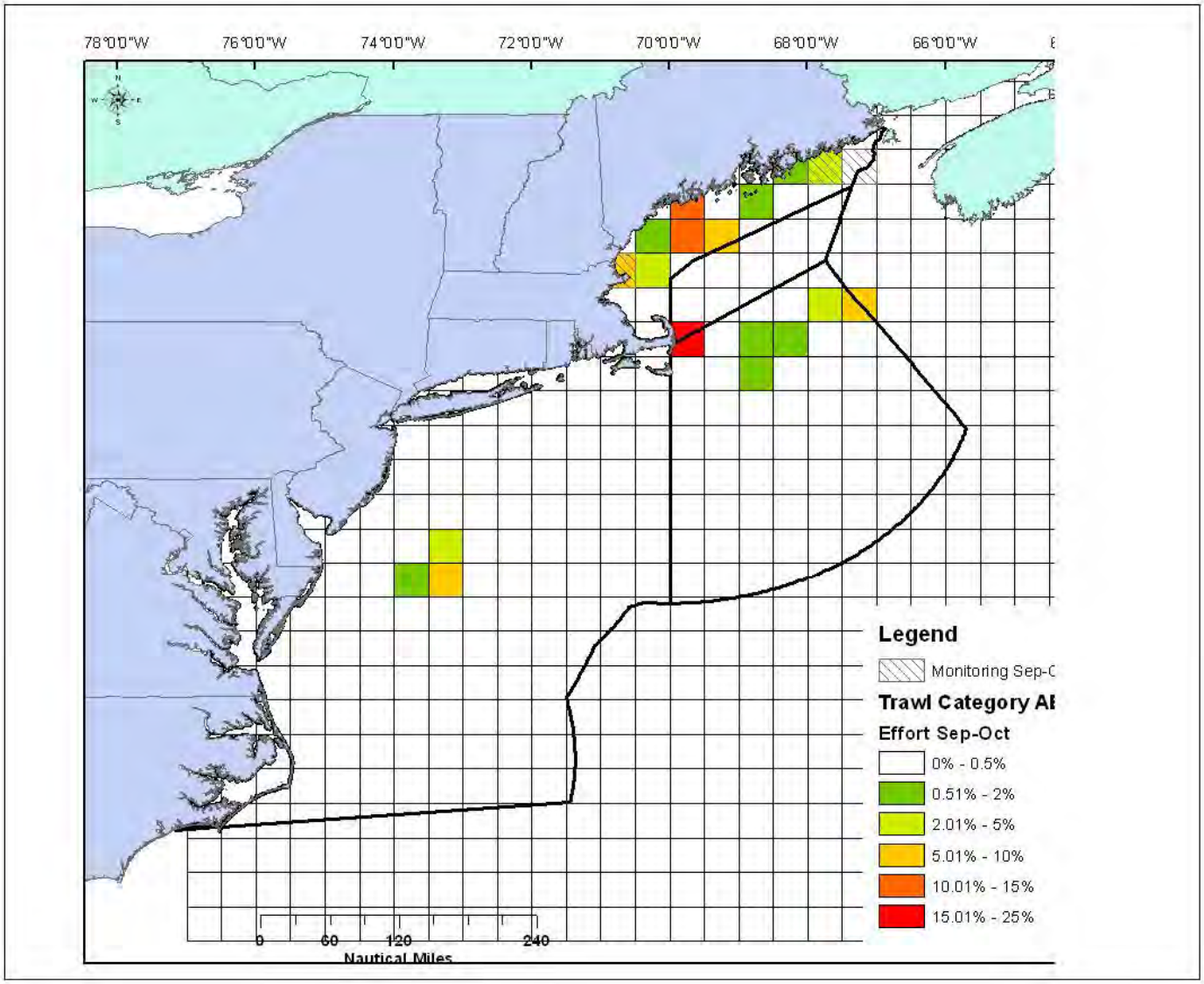


Figure 12 Trawl Effort (ABC only) and Monitoring Areas, November – December

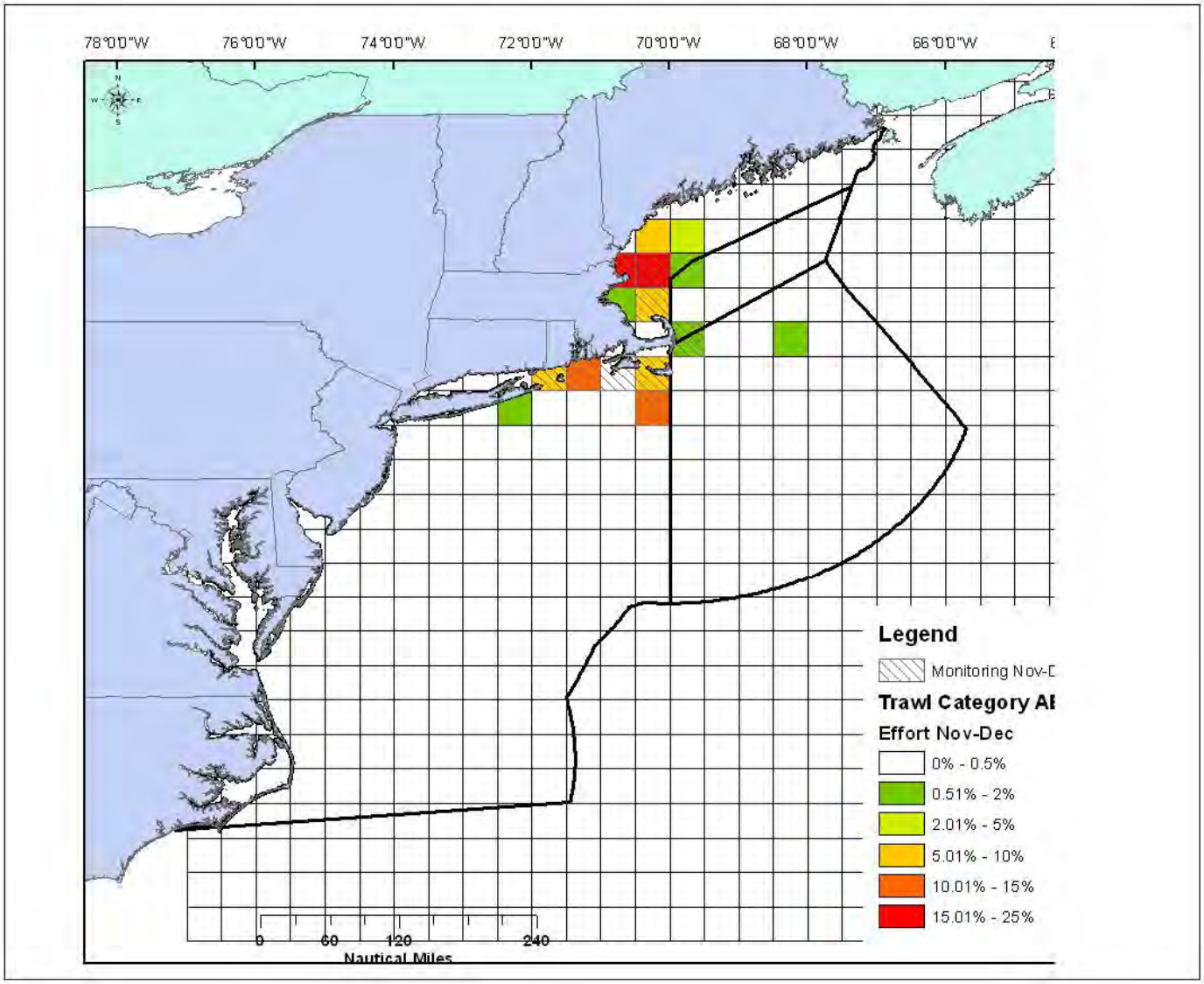


Figure 13 Purse Seine Effort and Monitoring Areas, May-June

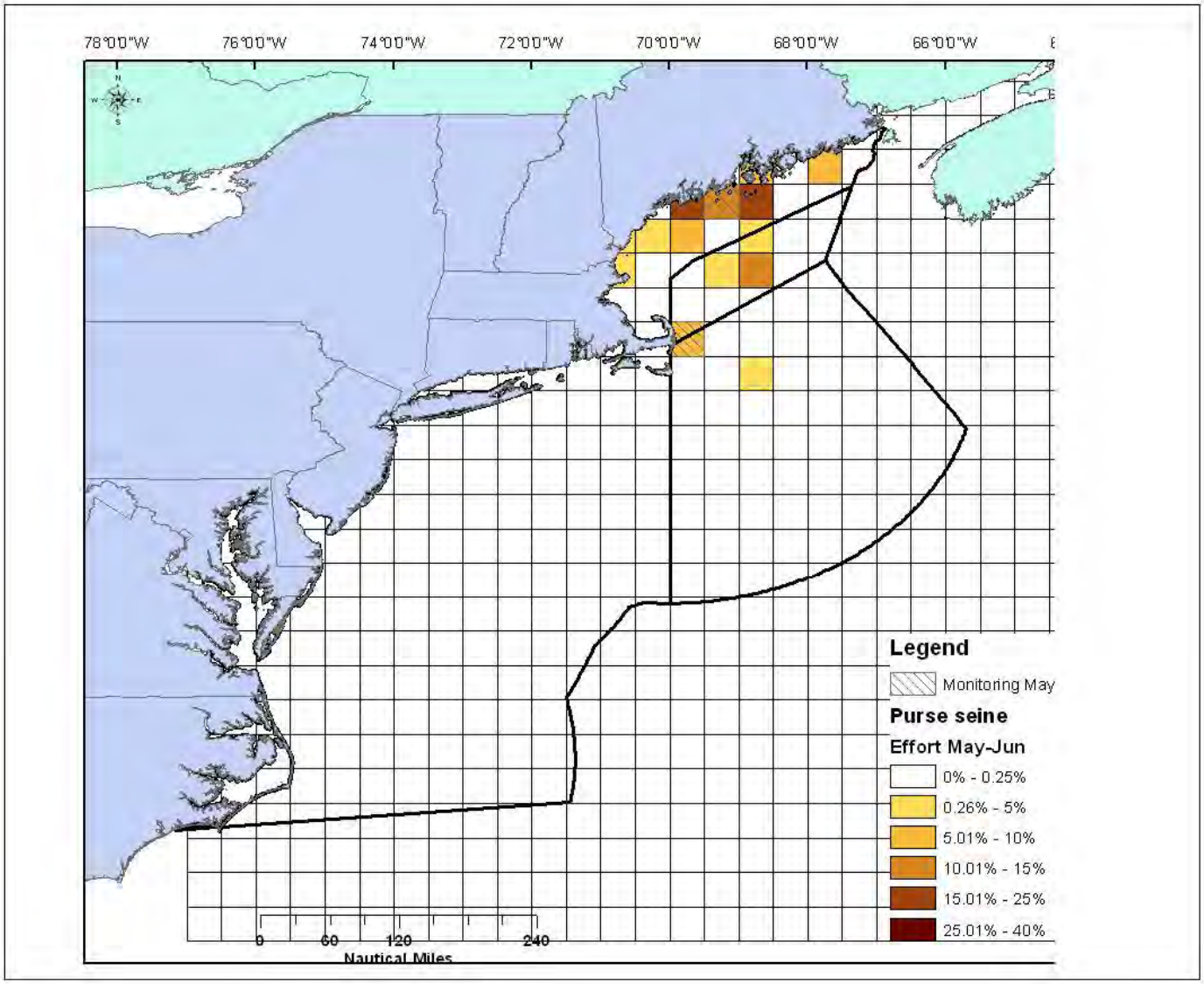


Figure 14 Purse Seine and Monitoring Areas, July – August

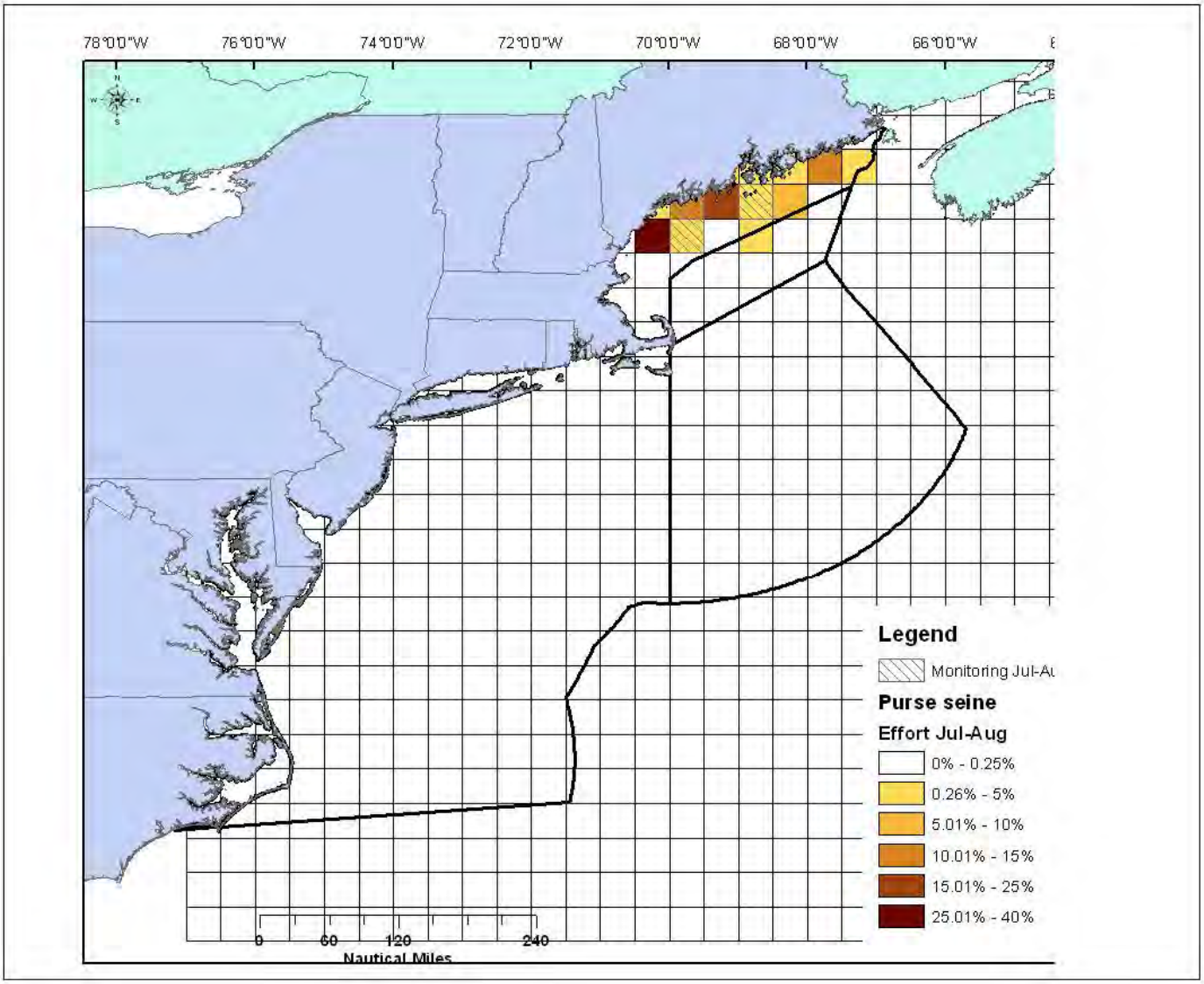


Figure 15 Purse Seine and Monitoring Areas, September – October

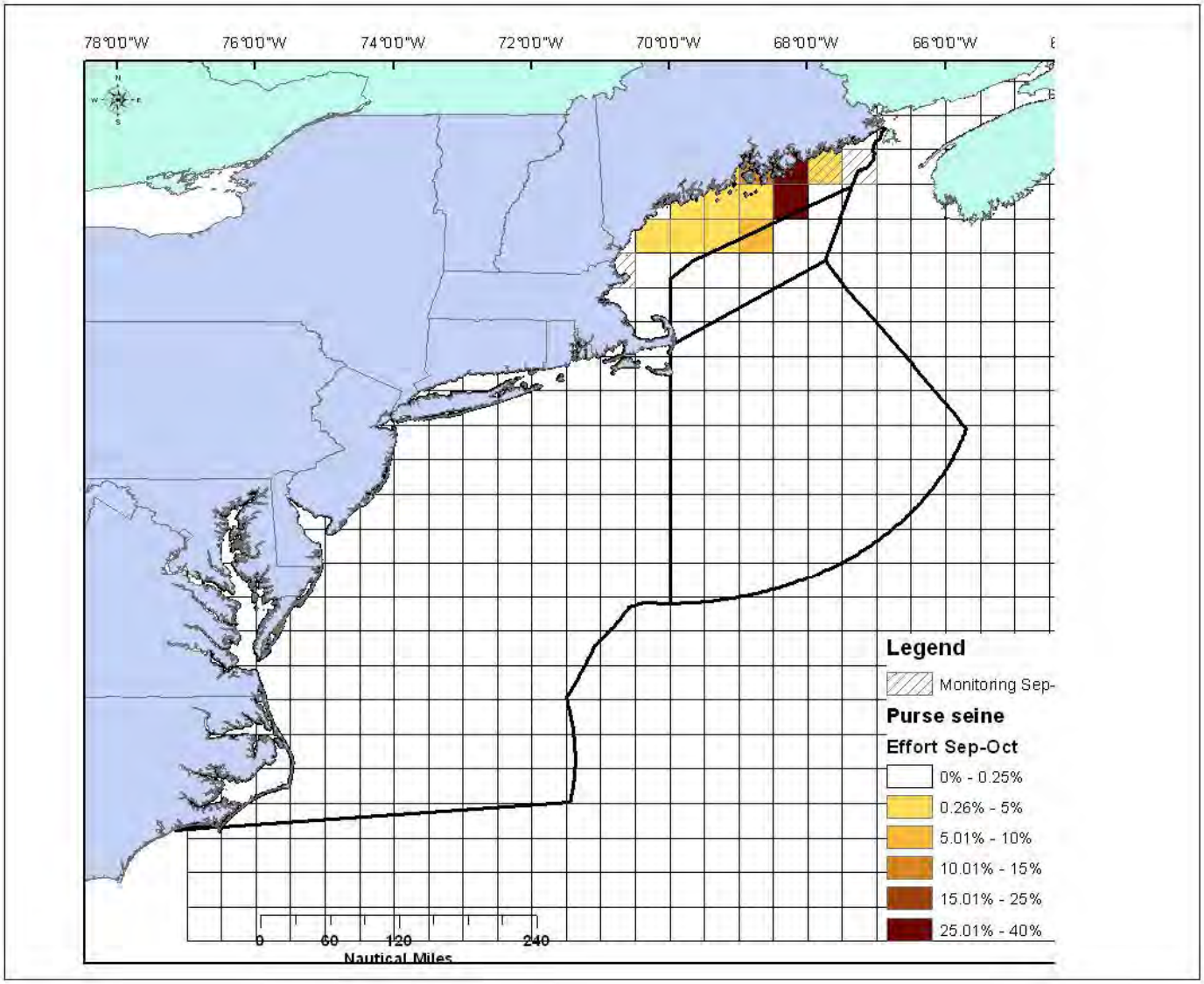


Figure 16 Purse Seine and Monitoring Areas, November – December

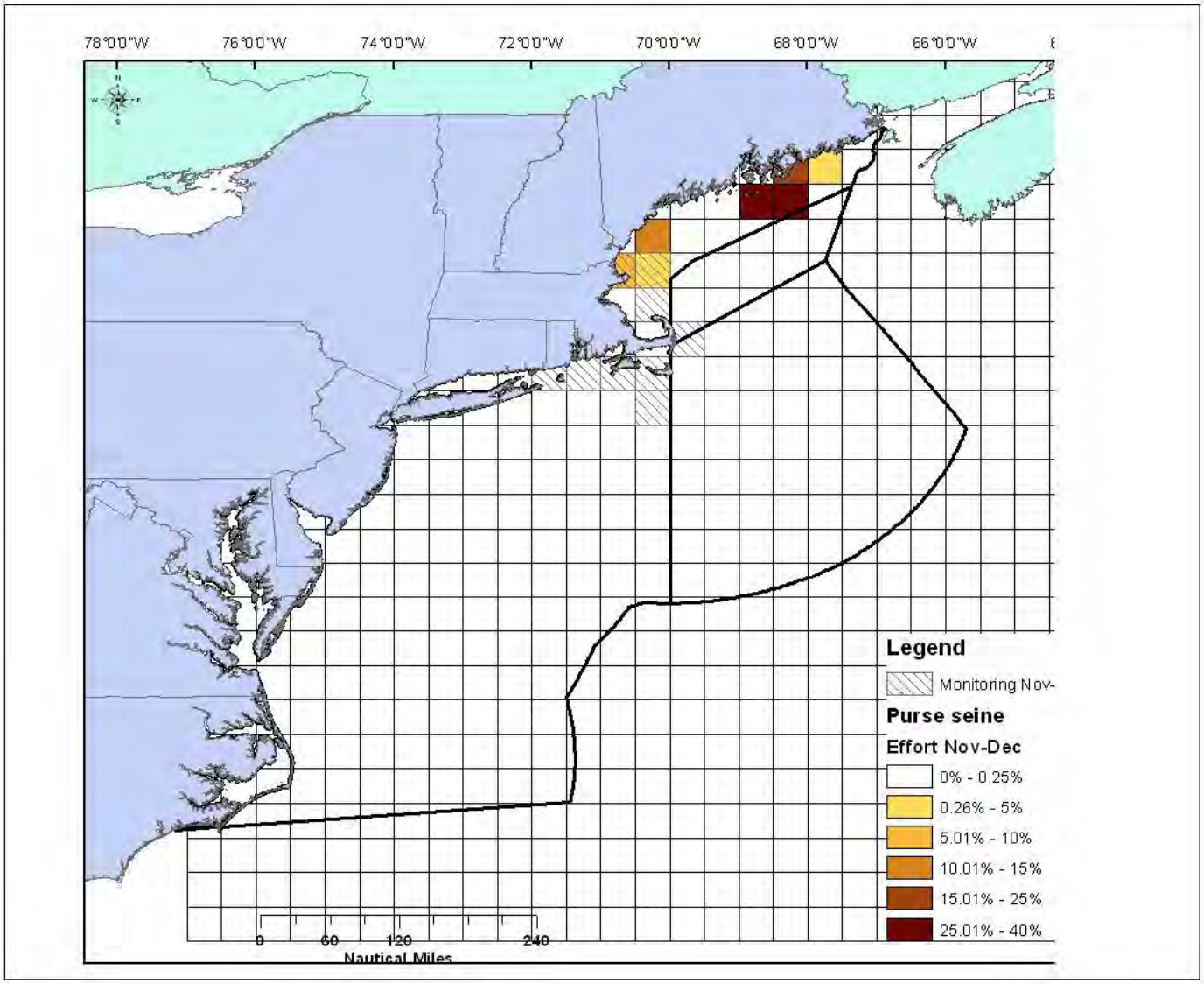


Figure 17 Trawl Effort (Category D Only) and Monitoring Areas, March-April

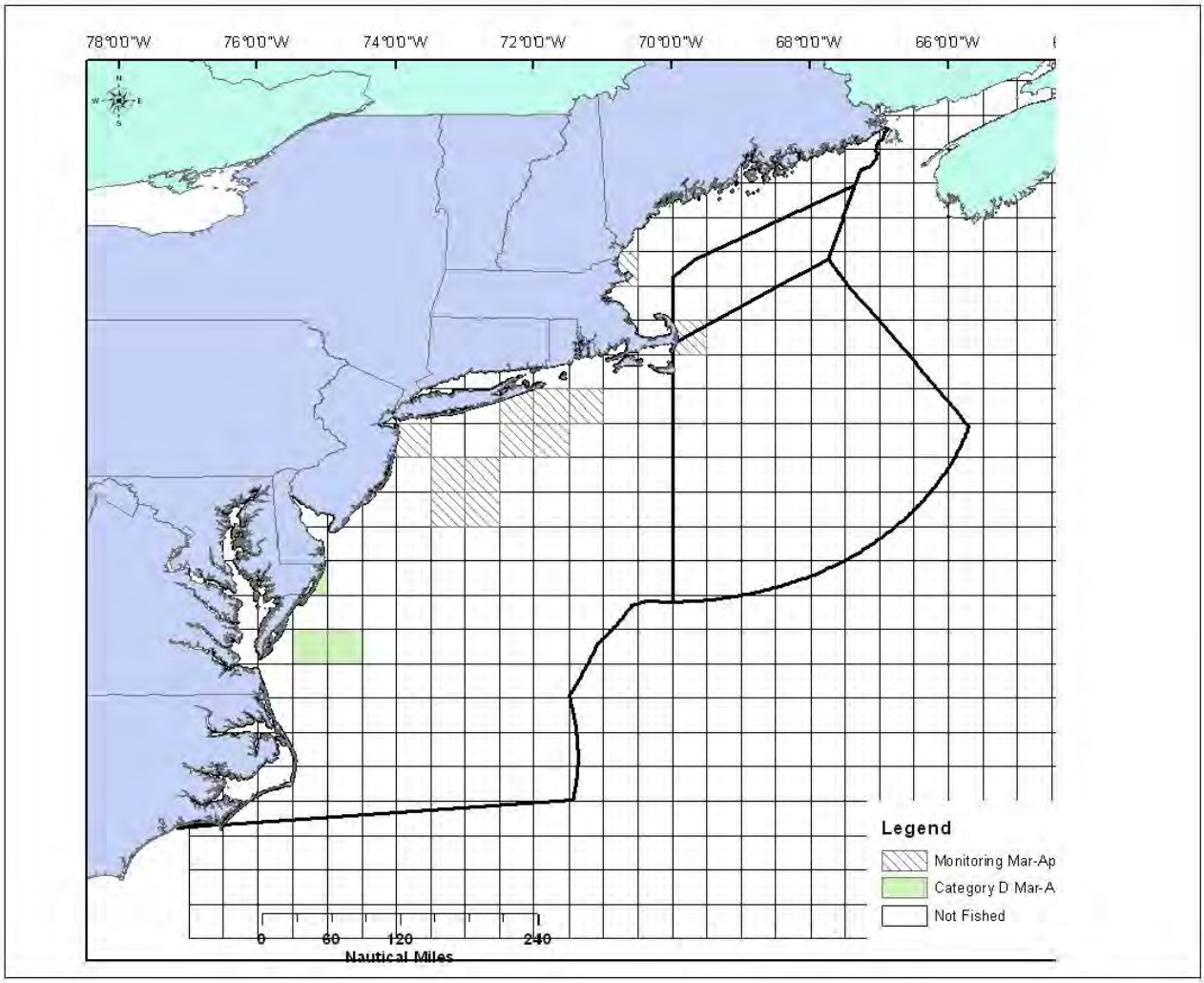


Figure 18 Trawl Effort (Category D Only) and Monitoring Areas, July – August

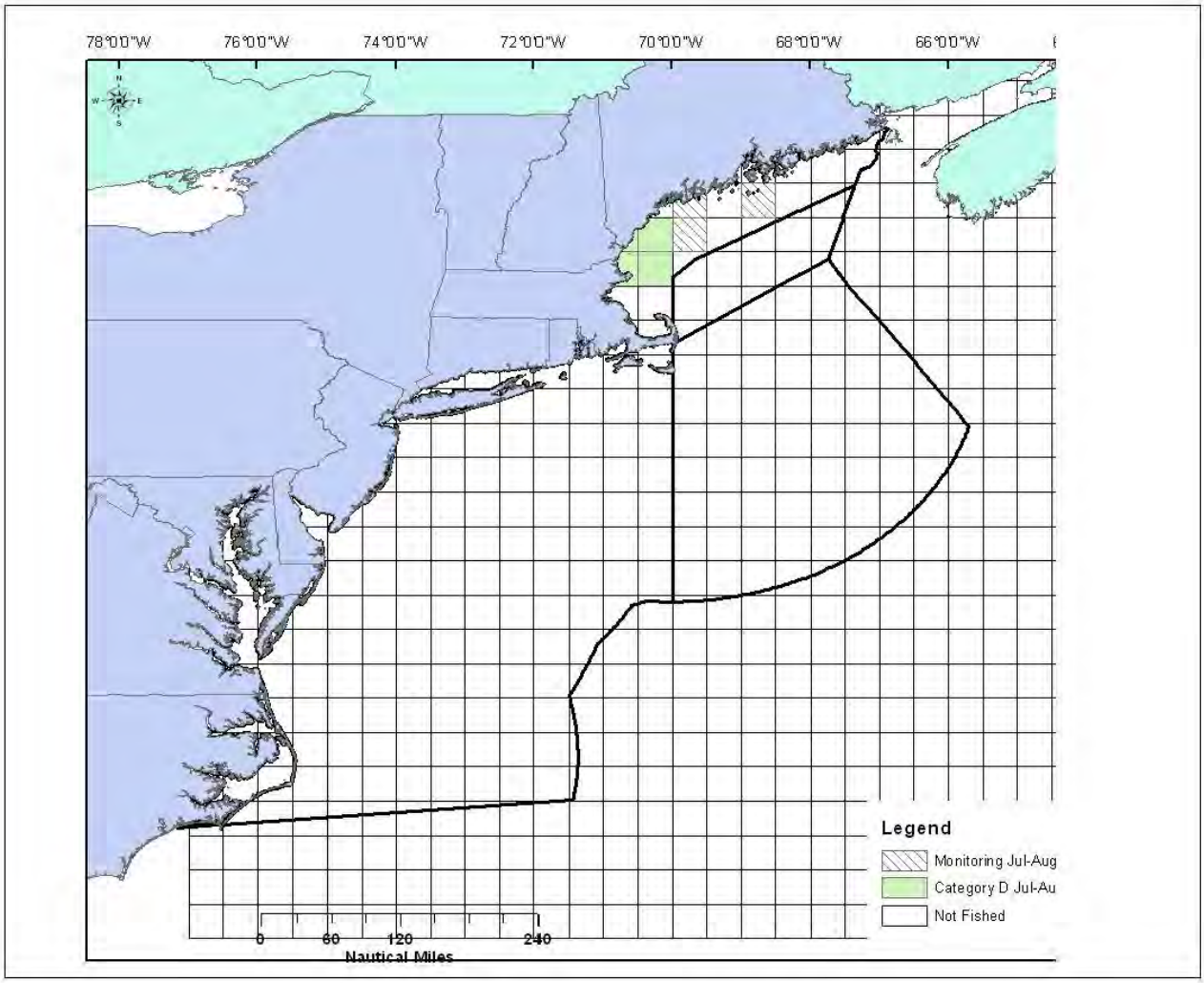


Figure 19 Trawl Effort (Category D Only) and Monitoring Areas, September – October

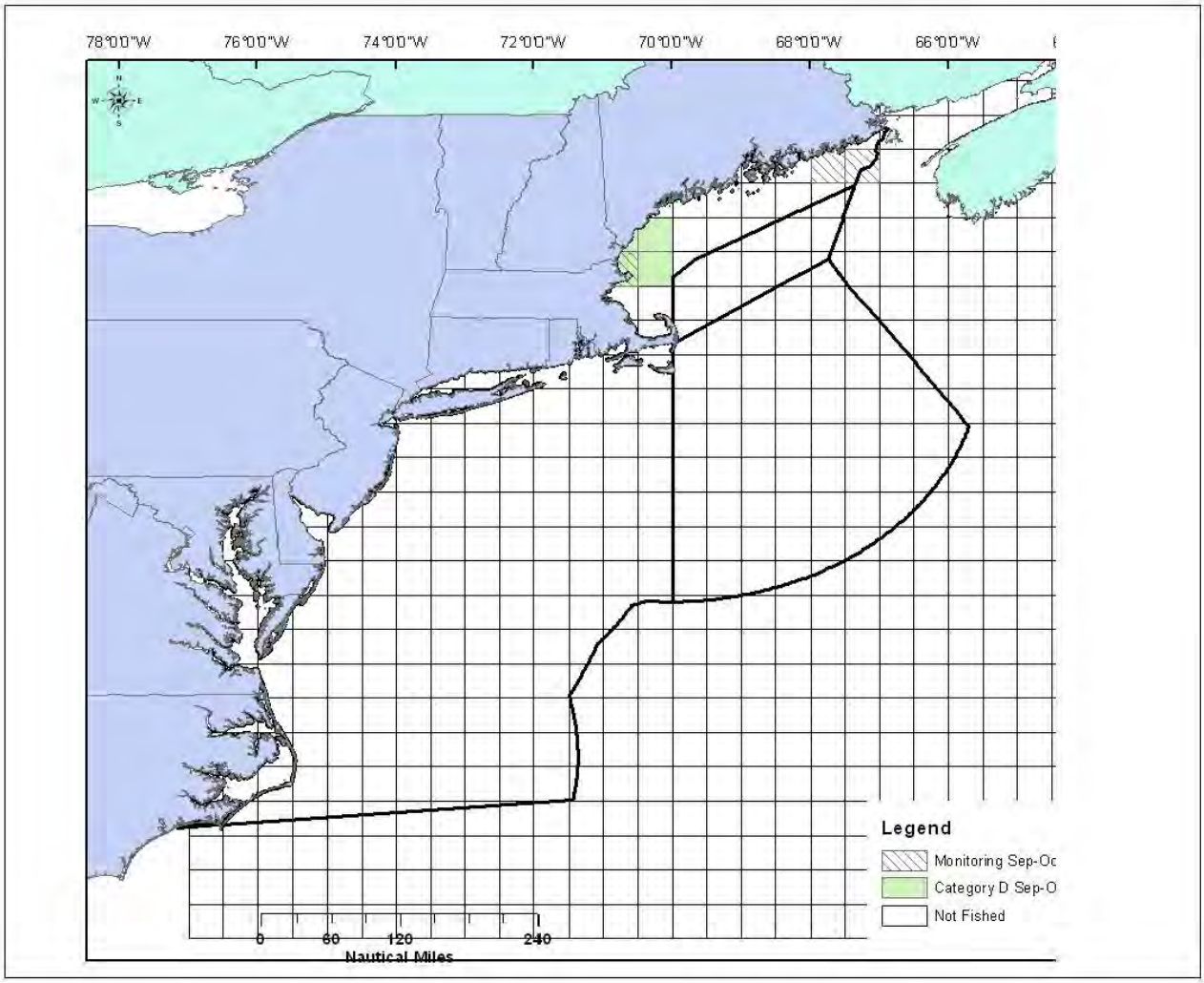


Figure 20 Trawl Effort (ABC only) and Protection Areas, January – February

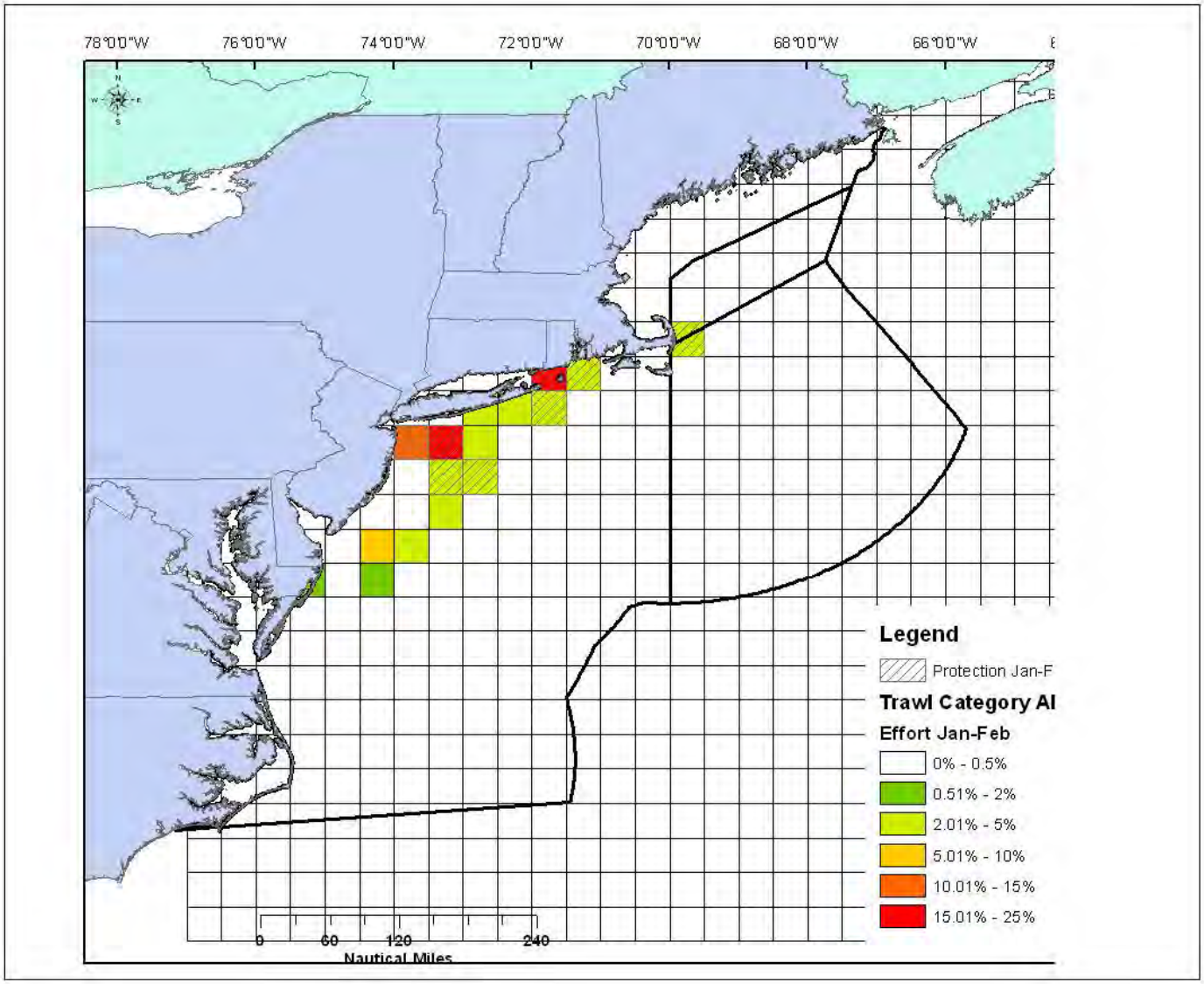


Figure 21 Trawl Effort (ABC only) and Protection Areas, March – April

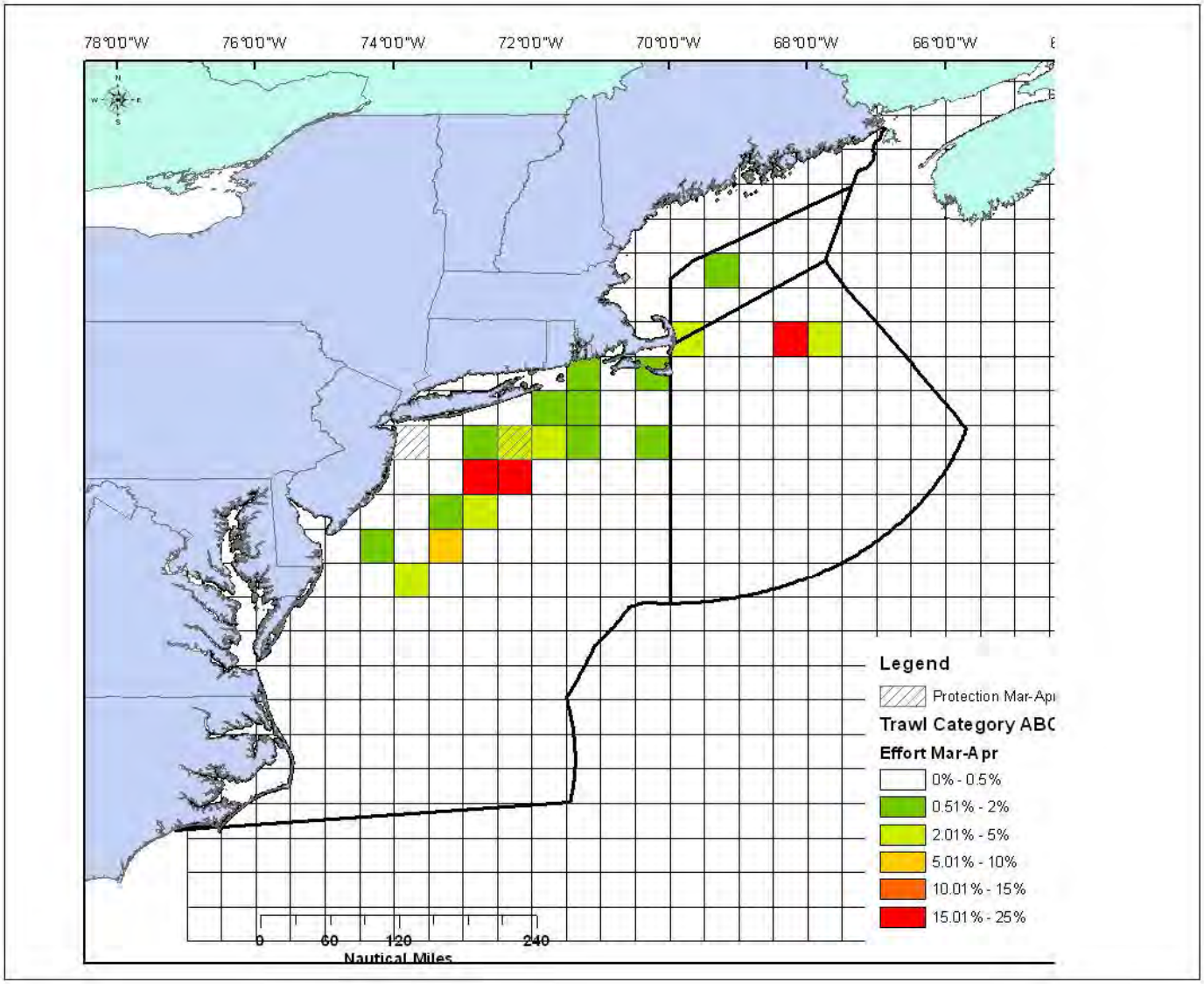


Figure 22 Trawl Effort (ABC Only) and Protection Areas, September – October

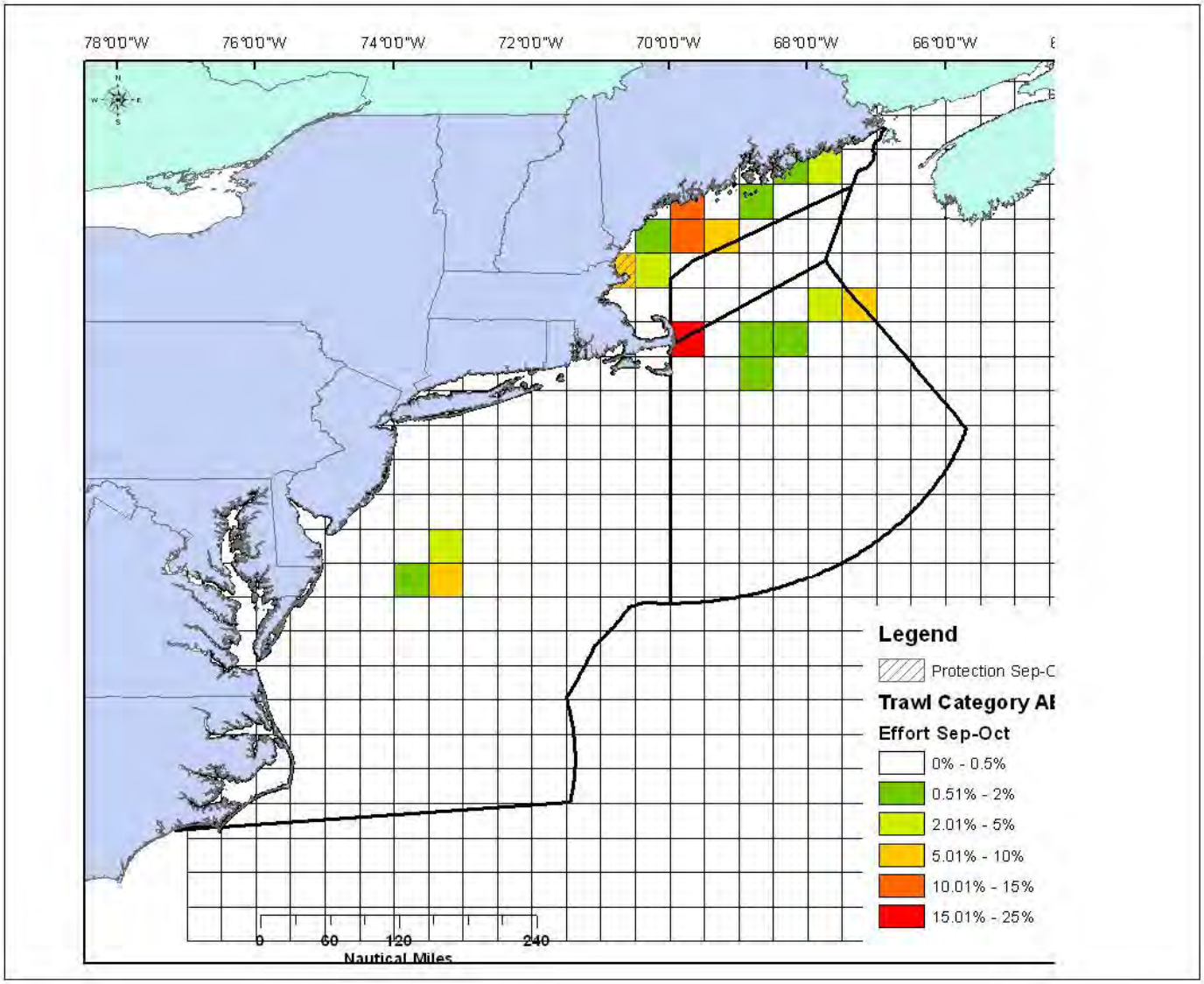


Figure 23 Trawl Effort (ABC Only) and Protection Areas, November – December

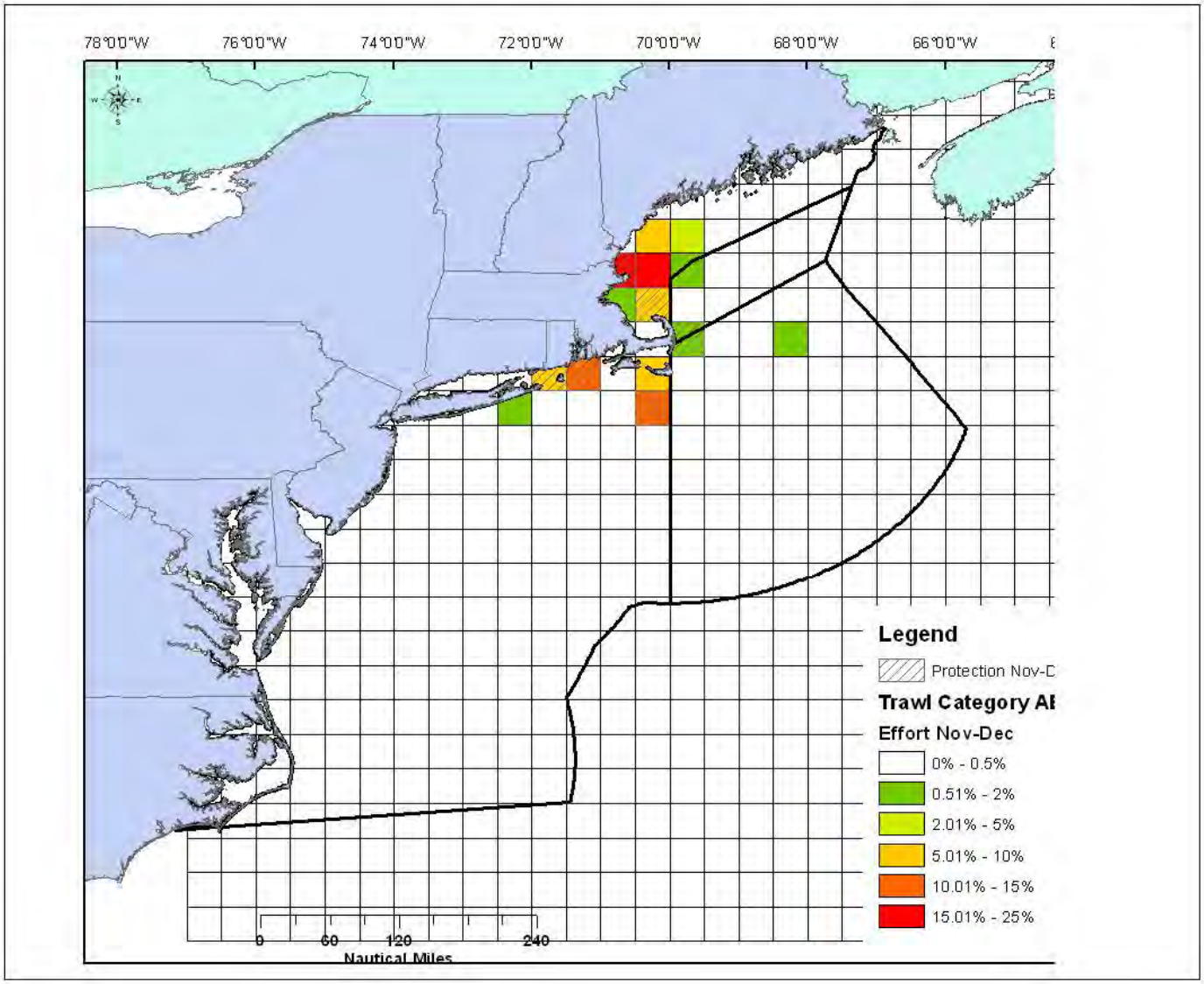


Figure 24 Purse Seine Effort and Protection Areas, September – October

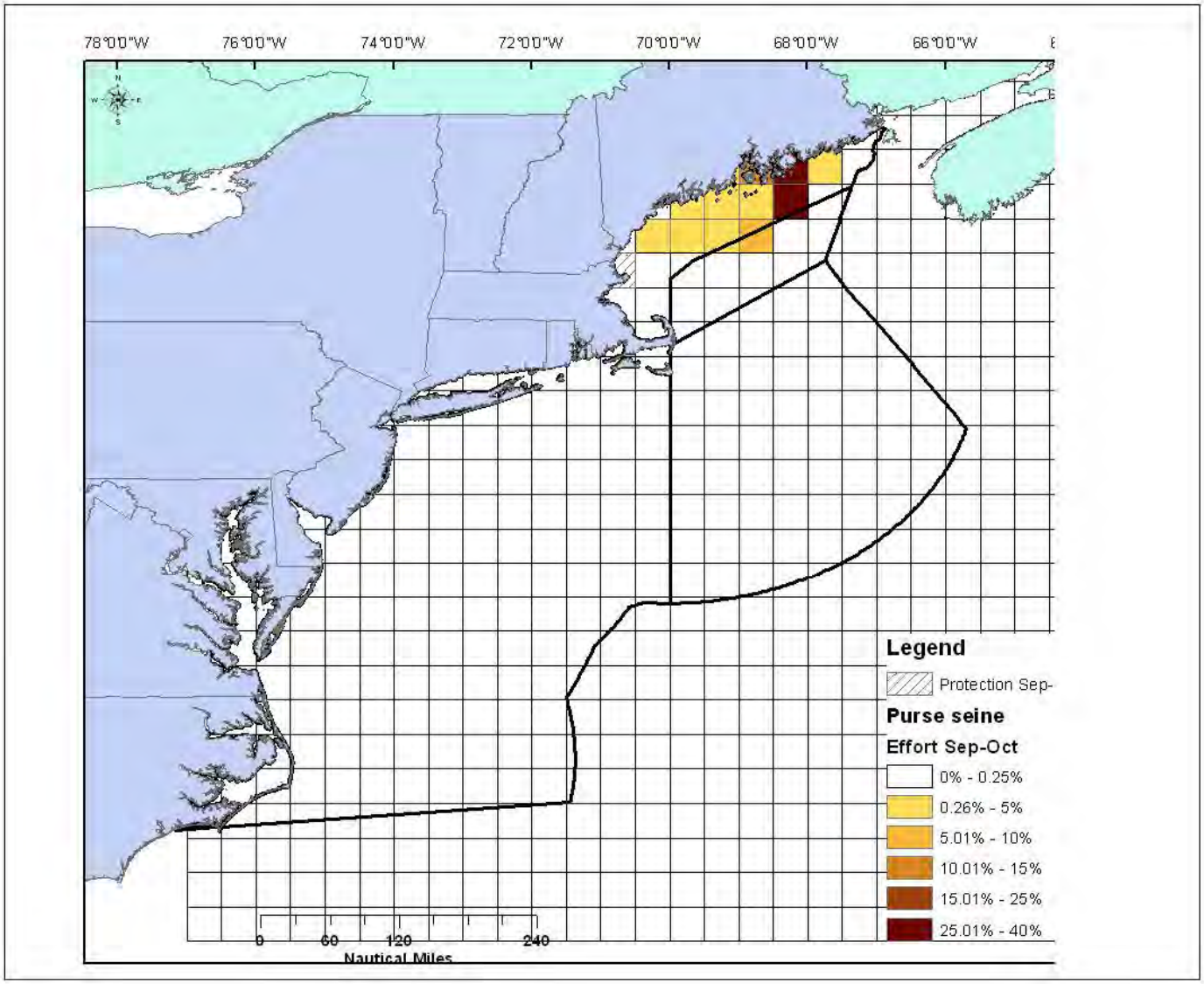


Figure 25 Purse Seine Effort and Protection Areas, November – December

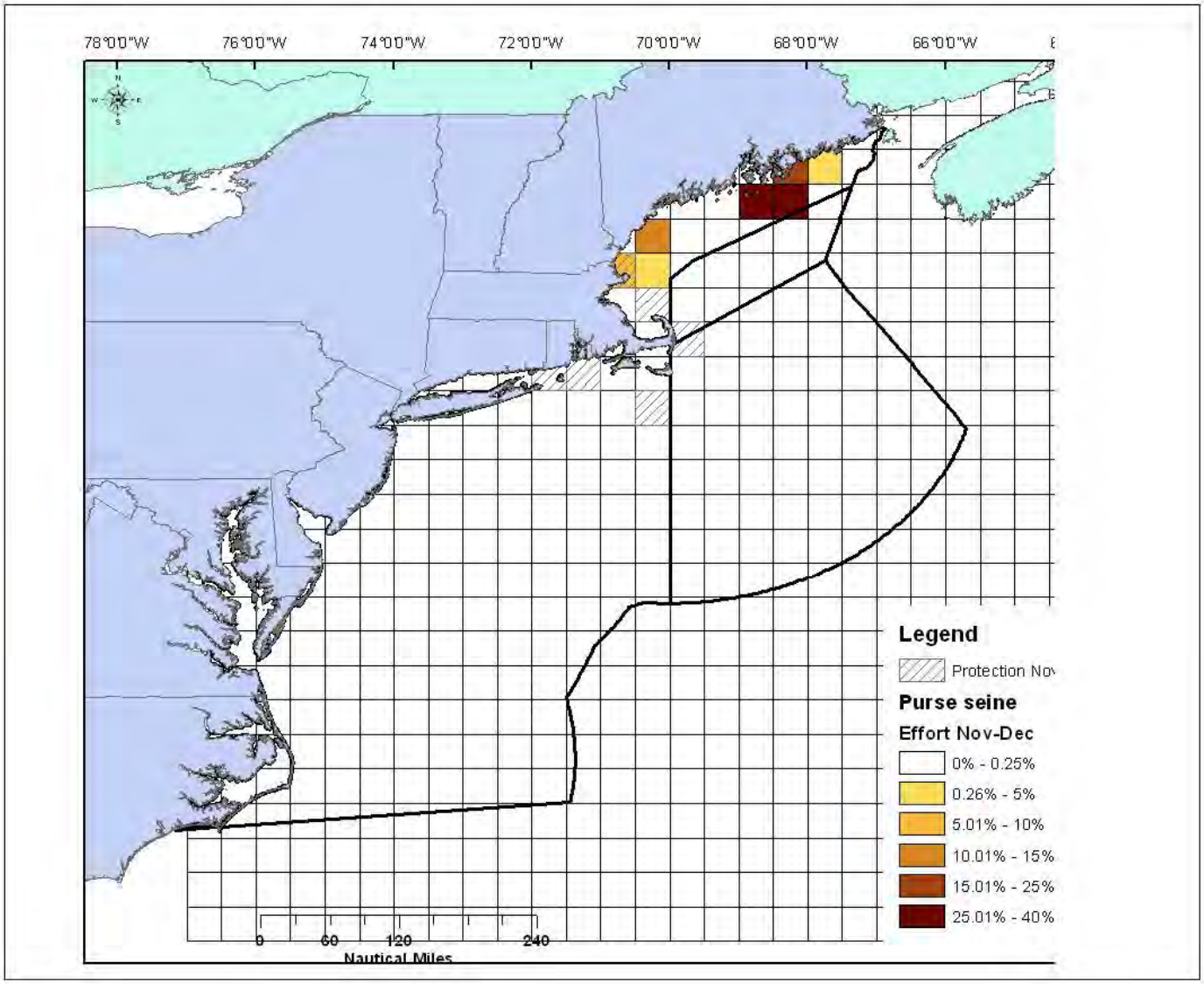


Figure 26 Trawl Effort (Category D Only) and Protection Areas, March – April

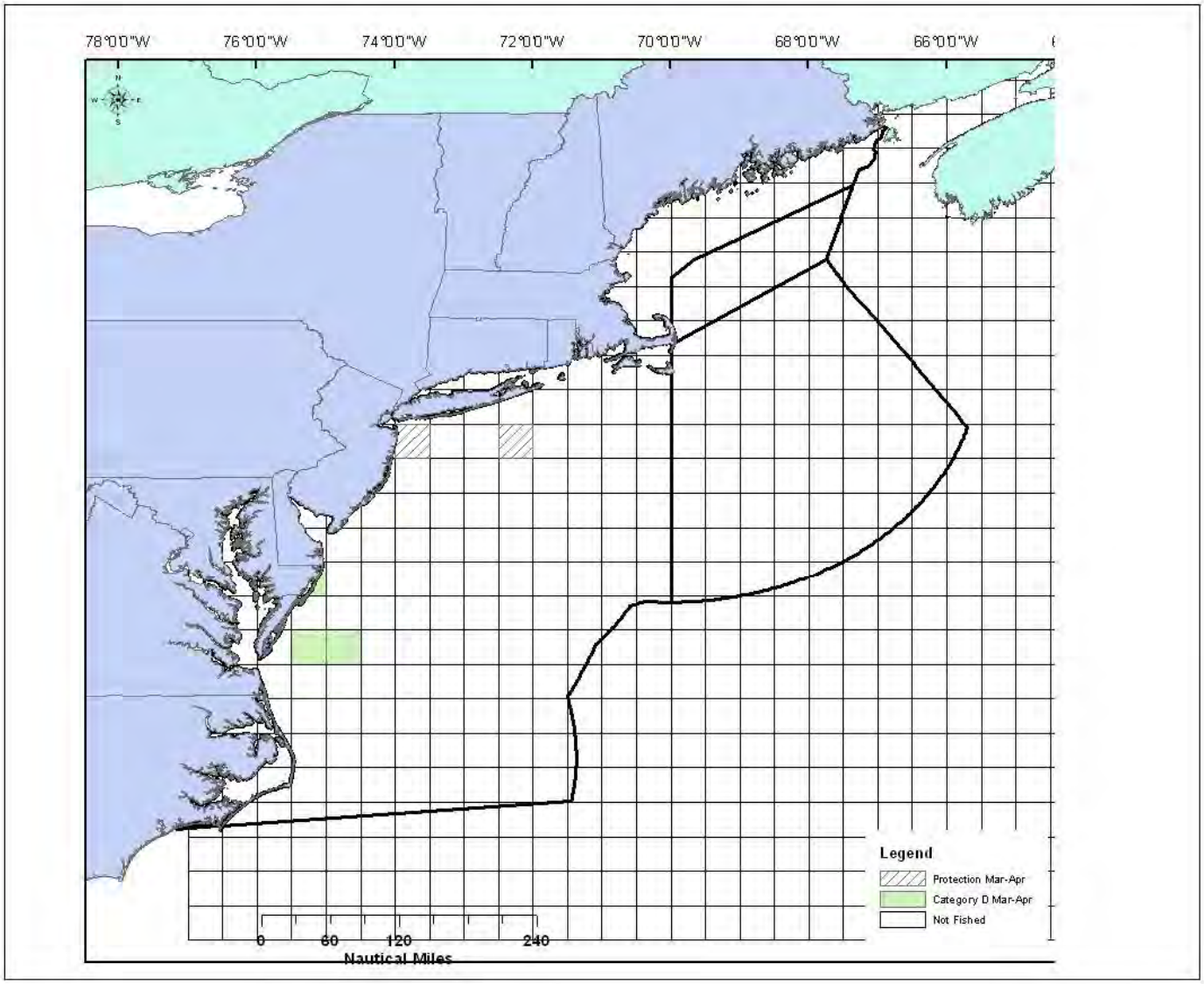
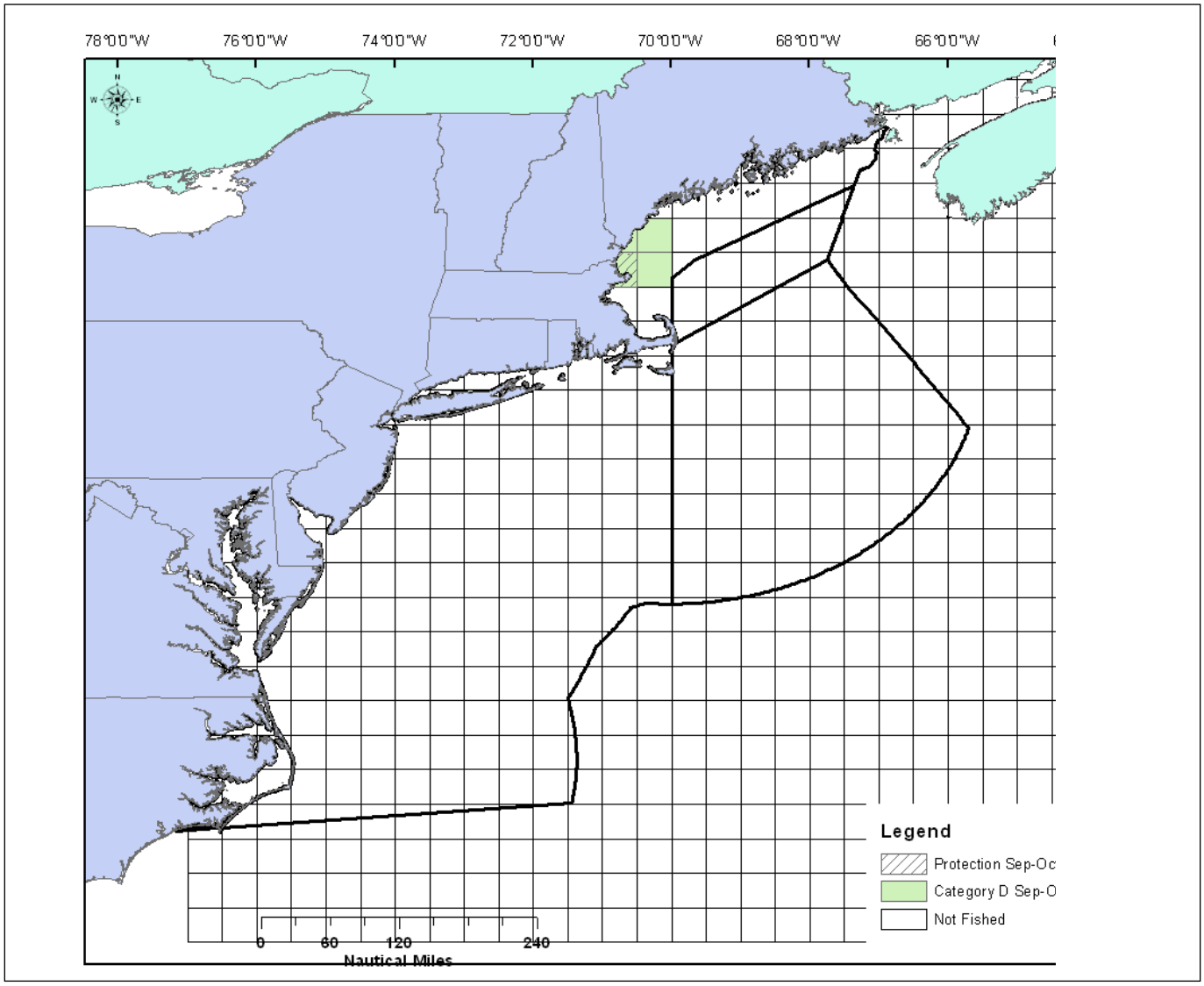


Figure 27 Trawl Effort (Category D Only) and Protection Areas, September - October



5.0 ANALYSIS OF THE PROPOSED RIVER HERRING MONITORING/AVOIDANCE AREAS (ALTERNATIVE 2)

5.1 QUALITATIVE ASSESSMENT

The river herring monitoring/avoidance areas options were compared to other areas identified using research surveys. The survey-based areas provide information on the times and areas were river herring are likely to be encountered absent information from the fishery. Additional information/analyses provided by the Herring PDT can be found in Volume II, Appendix III (Herring PDT Analysis: Development of Measures to Address River Herring Bycatch).

Table 12 – Table 17 and associated Figure 29 – Figure 35 provide a comparison of the bimonthly river herring monitoring/avoidance areas to associated survey-based areas. Each area is referenced as A- BB, with a map of all of these areas combined (Figure 28). The number of NEFOP observations used to identify each monitoring/avoidance area (fishery-based areas) are provided in Table 12 – Table 17. Further, the number of NMFS bottom-trawl surveys used to identify survey-based areas are found within hatched areas in Figure 29 – Figure 35. Several questions were asked to qualitatively compare fishery-based and survey-based areas:

1) Are there any adjacent fishery-based areas?
2) Are there any adjacent survey-based areas?
3) Does the fishery-based area overlap a survey-based area?

Adjacency was defined as areas sharing a side and/or corner. The results of this analysis for each bimonthly period are summarized in Table 12 – Table 17. One important caveat, noted above, is that the winter survey does not cover the Gulf of Maine.

Assessment

Alternative 2: Option 1, Option 2, and Option 3

In general, protection areas would improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring and could lead to possible reductions in river herring mortality if the fleet avoided those areas. As shown in this analysis, survey-based areas may also be important river herring areas and could be areas of future encounters by the fleet.

This option would have no reduction on river herring mortality in the monitoring/avoidance areas, if the fleet chooses to fish in these areas. Additionally, specific areas monitored instead of across the full range of the species misses important river herring encounters and influences river herring removals estimates.

Alternative 2: Option 4

With this option, areas with relatively high river herring encounters would be avoided (by time or distance) when river herring are encountered at some threshold level. The details of this option are currently under development and await results from the SFC/SMAST/MADMF pilot project. If the pilot is successful at developing at-sea river herring avoidance protocols for the Atlantic herring fleet, there could be reductions in river herring mortality in the bimonthly avoidance areas. Additionally, there would need to be adequate incentives in place for the fleet to avoid the areas.

However, an avoidance strategy linked to specific bimonthly avoidance areas (i.e. not implemented throughout the spatial and temporal extent of the Atlantic herring fishery), would miss river herring encounters in adjacent areas, as demonstrated by the survey-based areas (additional areas of likely river herring encounter). Such an approach would not reduce river herring mortality outside of avoidance areas. Furthermore, areas outside avoidance areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year river herring variability.

Table 12 Comparison of River Herring Monitoring/Avoidance for January-February (Fishery-Based Areas) with Winter Survey-Based Areas

	Monitoring/Avoidance Areas January - February												
Map reference	**G**	**J**	**K**	**L**	**O**	**P**	**Q**	**S**	**T**	**U**	**X**	**Y**	**Z**
Quarter-degree square	**42704**	**41694**	**41712**	**41711**	**40723**	**40714**	**40713**	**40732**	**40731**	**40722**	**39733**	**39724**	**39723**
How many observer tows were greater than 40 lbs of river herring?	**1**	**5**	**31**	**43**	**1**	**5**	**3**	**3**	**8**	**3**	**12**	**4**	**2**
Are there any adjacent fishery-based areas?	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Are there any adjacent winter survey-based areas?	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Does the fishey-based area overlap a survey-based area?	**NO**	**NO**	**NO**	**NO**	**YES**	**YES**	**YES**	**NO**	**NO**	**YES**	**YES**	**NO**	**NO**

Table 13 Comparison of River Herring Monitoring/Avoidance for March-April (Fishery-Based Areas) with Spring Survey-Based Areas

	Monitoring/Avoidance Areas March - April											
Map reference	G	J	O	P	Q	S	V	W	X	Y	AA	BB
Quarter-degree square	42704	41694	40723	40714	40713	40732	40721	40712	39733	39724	39731	39722
How many observer tows were greater than 40 lbs of river herring?	1	3	1	1	2	4	2	1	2	3	1	1
Are there any adjacent fishery-based areas?	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Are there any adjacent spring survey-based areas?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Does the fishey-based area overlap a survey-based area?	YES	NO	YES	YES	YES	NO	YES	YES	YES	NO	NO	NO

Table 14 Comparison of River Herring Monitoring/Avoidance for May-June (Fishery-Based Areas) with Spring Survey-Based Areas

	Monitoring/Avoidance Areas May - June	
Map reference	D	J
Quarter-degree square	43693	41694
How many observer tows were greater than 40 lbs of river herring?	1	2
Are there any adjacent fishery-based areas?	NO	NO
Are there any adjacent spring survey-based areas?	YES	YES
Does the fishey-based area overlap a survey-based area?	NO	NO

Table 15 Comparison of River Herring Monitoring/Avoidance for July-August (Fishery-Based Areas) with Summer Survey-Based Areas

	Monitoring/Avoidance Areas July - August		
Map reference	C	E	F
Quarter-degree square	43694	43684	43692
How many observer tows were greater than 40 lbs of river herring?	2	1	2
Are there any adjacent fishery-based areas?	YES	NO	YES
Are there any adjacent summer survey-based areas?	YES	YES	YES
Does the fishey-based area overlap a survey-based area?	NO	YES	NO

Table 16 Comparison of River Herring Monitoring/Avoidance for September-October (Fishery-Based Areas) with Fall Survey-Based Areas

	Monitoring/Avoidance Areas September - October		
Map reference	A	B	G
Quarter-degree square	44672	44671	42704
How many observer tows were greater than 40 lbs of river herring?	1	1	15
Are there any adjacent fishery-based areas?	YES	YES	NO
Are there any adjacent fall survey-based areas?	YES	YES	YES
Does the fishey-based area overlap a survey-based area?	YES	YES	YES

Table 17 Comparison of River Herring Monitoring/Avoidance for November-December (Fishery-Based Areas) with Fall And Winter Survey-Based Areas

	Monitoring/Avoidance Areas November - December								
Map reference	G	H	I	J	K	L	M	N	R
Quarter-degree square	42704	42703	42701	41694	41712	41711	41702	41701	40703
How many observer tows were greater than 40 lbs of river herring?	29	7	1	23	3	4	2	4	1
Are there any adjacent fishery-based areas?	YES	YES	YES	YES	YES	YES	YES	YES	YES
Are there any adjacent fall survey-based areas?	YES	YES	YES	YES	YES	YES	YES	YES	YES
Are there any adjacent winter survey-based areas?	NO	NO	NO	NO	YES	YES	YES	YES	YES
Does the fishey-based area overlap a fall survey-based area?	YES	YES	YES	NO	NO	YES	NO	NO	NO
Does the fishey-based area overlap a winter survey-based area?	NO	NO	NO	NO	NO	NO	NO	NO	NO

Figure 28 Map of River Herring Monitoring/Avoidance Areas for All Months Combined

Individual areas (grey blocks) are identified A-BB.

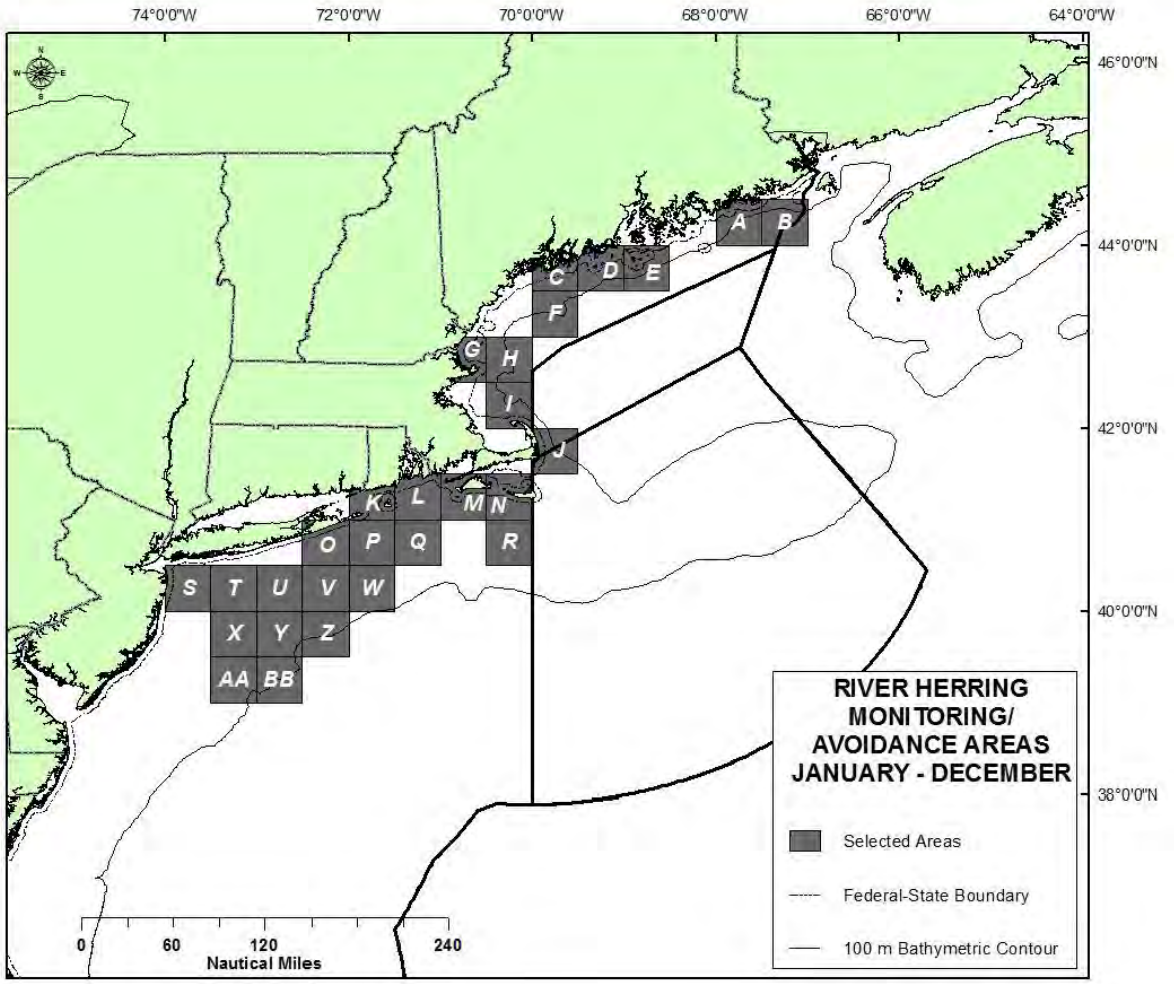


Figure 29 Map of River Herring Monitoring/Avoidance Areas for January - February (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

Figure 30 Map of River Herring Monitoring/Avoidance Areas for March - April (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

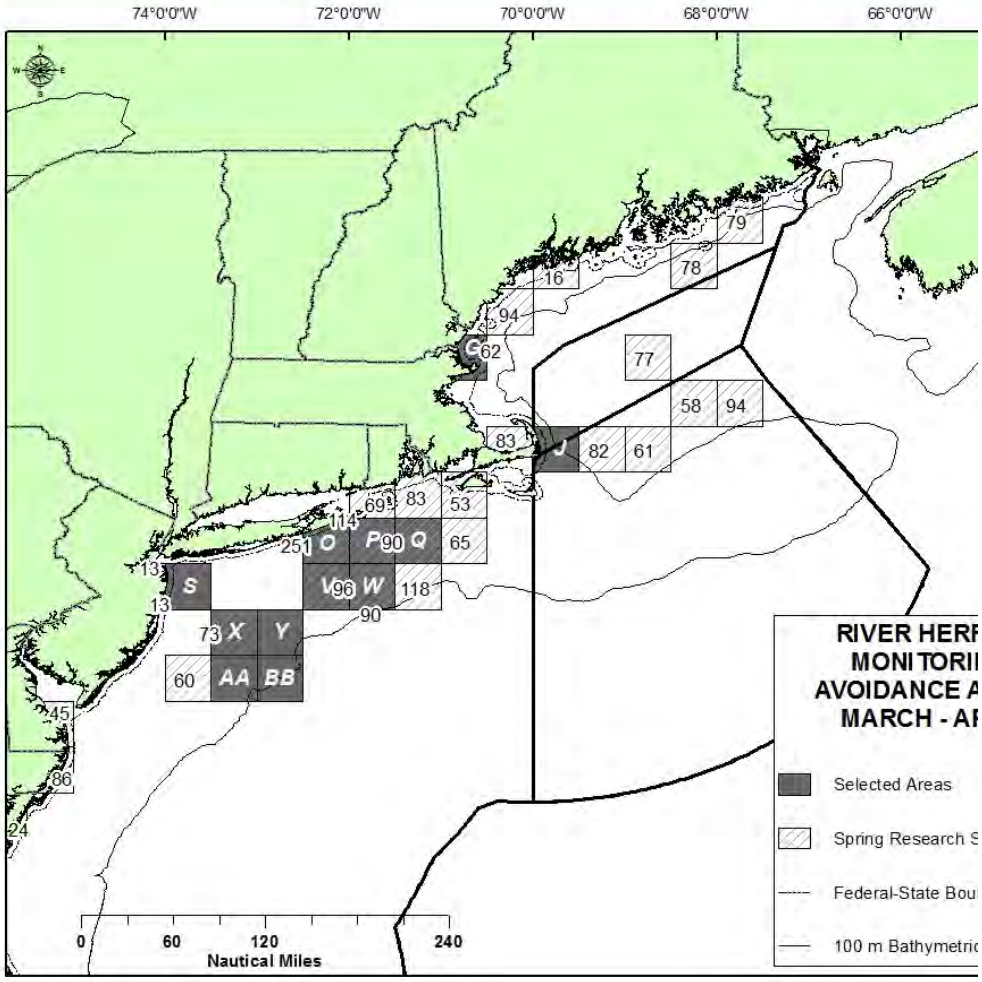


Figure 31 Map of River Herring Monitoring/Avoidance Areas for May - June (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

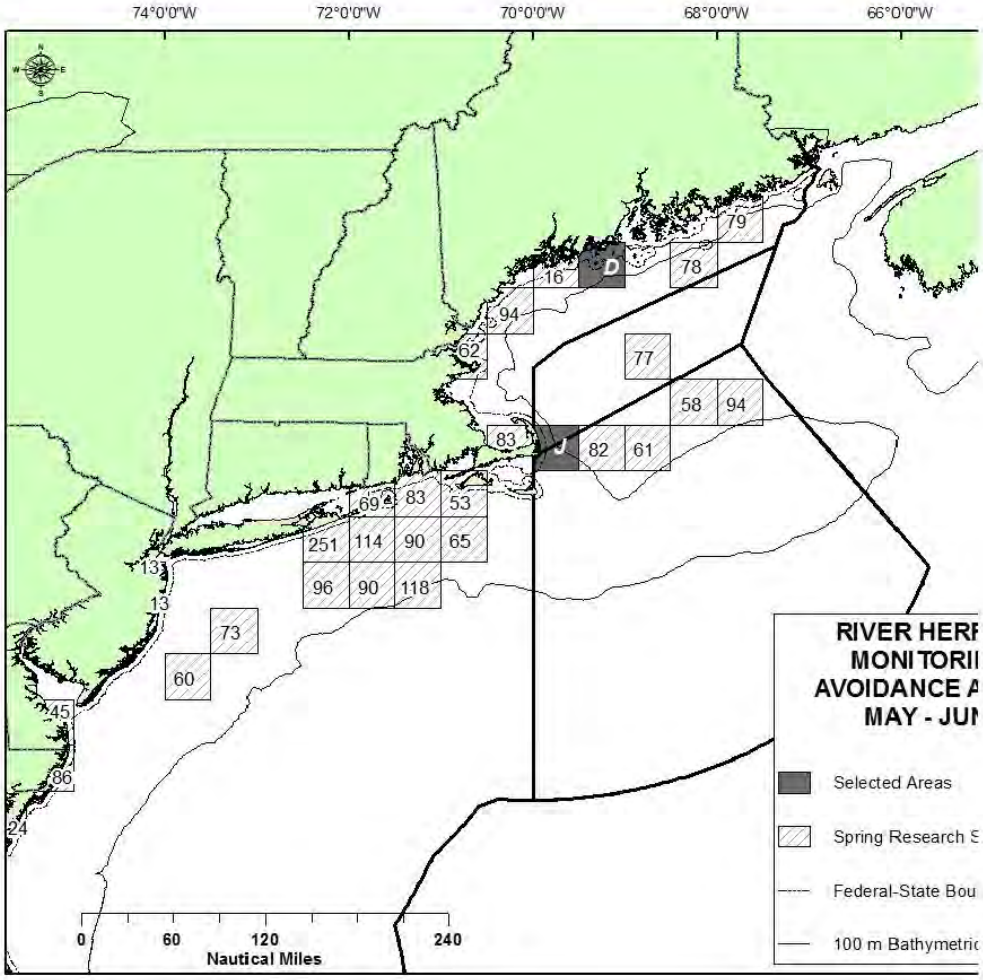


Figure 32 Map of River Herring Monitoring/Avoidance Areas for July - August (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

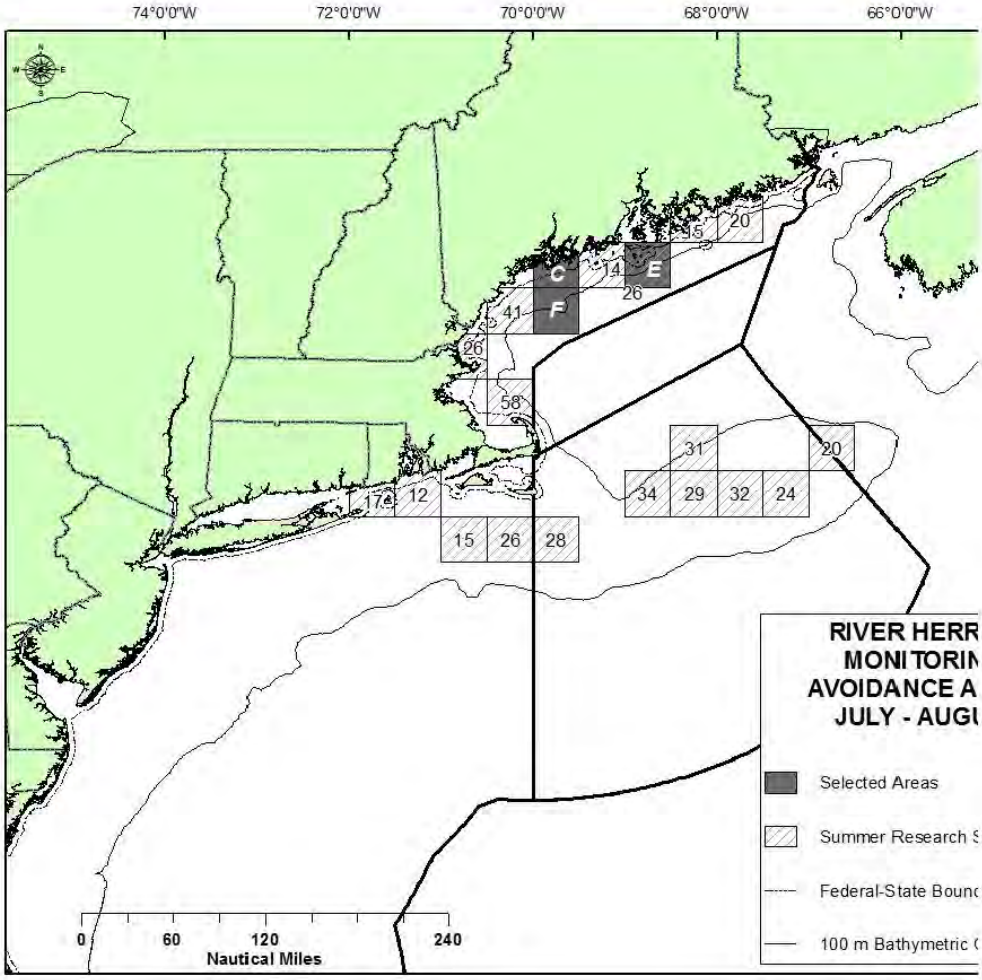


Figure 33 Map of River Herring Monitoring/Avoidance Areas for September – October (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

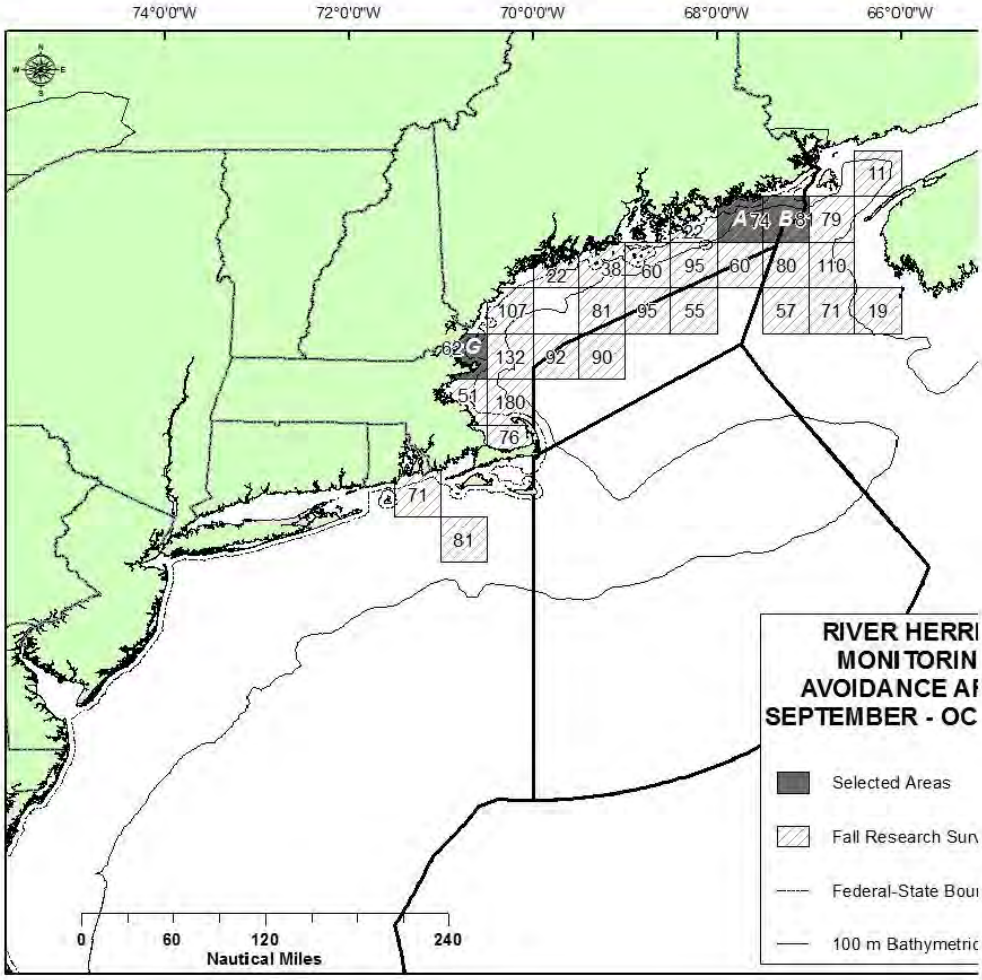


Figure 34 Map of River Herring Monitoring/Avoidance Areas for November - December (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

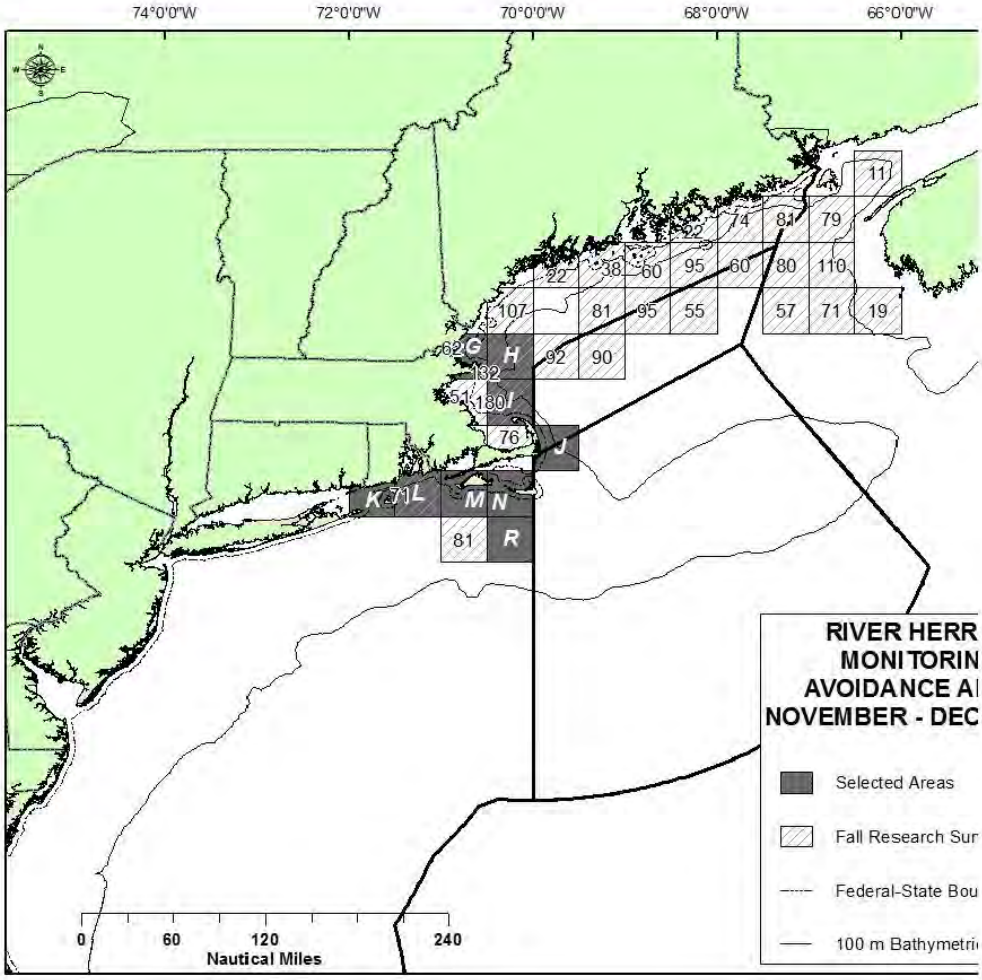
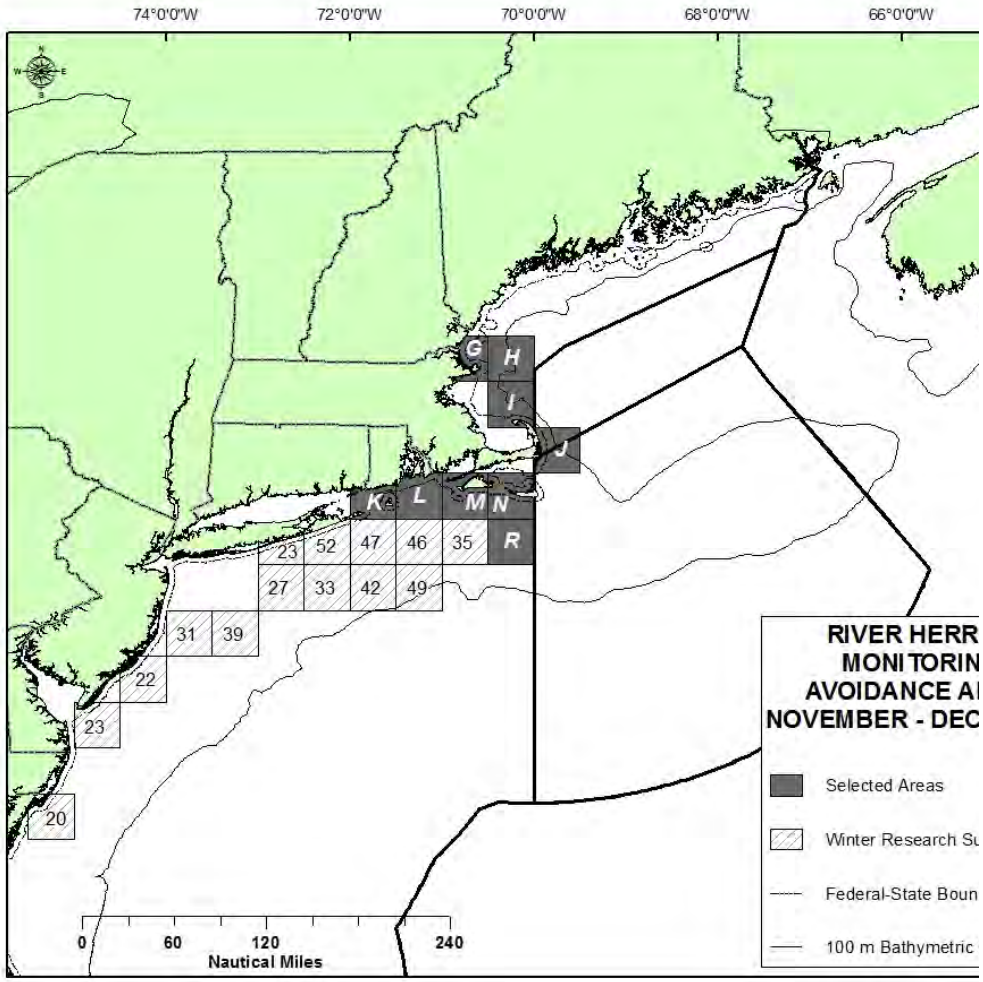


Figure 35 Map of River Herring Monitoring/Avoidance Areas for November - December (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.



5.2 IMPACTS OF MONITORING OPTIONS

Option 1

Option 1A requires 100% observer coverage for A/B/C vessels when on a declared herring trip. Table 22 – Table 29 summarize the fishing effort, herring revenues, herring landings, and total revenues which were located in the monitoring options. Approximately 6% of the purse seine effort, catch, and revenues are derived from the monitoring areas. While 22-24% of the Category D effort, catch, and revenues are derived from the monitoring areas, the magnitude of effort, catch, and revenues attributable to Category D vessels is minimal. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas.

Sub-option 1A requires 100% observer coverage for A/B/C vessels in the Monitoring Areas when on a declared herring trip. Table 20 describes the total number of trips and number of observer-days required to meet this coverage if this option had been active in 2010. In 2010, 343 trips (51.7% of total trips) entered the monitoring areas. 974 observer-days would have been required under Option 1A if this option had been in place during 2010.

In order to place the costs of industry-funded observers into context, Table 18 summarizes average revenues per trip, average revenues per day absent, operating costs per trip, and operating costs per day absent, classified by gear type for 2008-2010. Revenues were calculated using the VTR and Dealer data while operating costs were based on data collected through the observer program. Operating costs in this fishery are primarily fuel expenses; the price of fuel has fluctuated (along with the price of crude oil) over the past three years.

Table 18 2008-2010 Average Revenues, Costs Per Day and Average Revenues, Costs Per Trip for Category A/B/C Herring Vessels

	Revenue/Day	Revenue/Trip	Operating Costs/Day	Operating Costs/Trip
Single Midwater Trawl	$12,853	$41,721	$4,271	$12,608
Pair Trawl	$15,683	$43,166	$3,295	$9,372
Purse Seine	$18,557	$25,499	$1,798	$2,746
Bottom Trawl	$5,325	$7,863	$785	$524

Revenue Data is from VTR and Dealer (n=5,329)
Operating Costs data is from Observer (n=352)

Relative to the daily operating costs for the fishery, the cost of an observer is fairly high. For example, a NEFOP observer would increase the per-day costs of bottom trawl, single midwater trawl, pair trawl, and purse seine by 153%, 28%, 36%, and 67% respectively (Table 19). However, relative to daily revenues, the cost of an observer is lower; an observer would cost 22%, 9%, 9%, and 6% of average daily revenues for the bottom, midwater, pair trawl, and purse seine vessels. These numbers are presented for illustration; it is possible that the type of data required in this fishery would result in higher or lower per-day costs than described in Table 18.

Table 19 Cost of a NEFOP Observer as a Percentage of Daily Revenues and Daily Operating Costs

	Revenue	Costs
Single Midwater Trawl	9.3%	28.1%
Pair Trawl	7.7%	36.4%
Purse Seine	6.5%	66.7%
Bottom Trawl	22.5%	152.8%

Option 1B requires 100% observer coverage for A/B/C and Category D (open access) vessels when on a declared herring trip. Table 22 – Table 29 summarize the fishing effort, herring revenues, herring landings, and total revenues which were located in the monitoring options. The impacts of this measure are similar to Option 1A. Table 21 describes the total number of trips and number of observer-days required to meet this coverage if this option had been active in 2010. In 2010, 356 trips (50.3% of total trips) entered the proposed monitoring areas. 987 observer-days would have been required under Option 1B if this option had been effective during 2010.

Category C and D Vessels

The potential costs of monitoring the Category C herring vessels is discussed relative to the observer allocation alternatives under consideration in Volume I of the Amendment 5 DEIS document (100% observer coverage). It is possible that Category D vessels would relinquish their herring permit if required to pay for an observer.

Option 2

In general, the affected trips and required coverage for 100% observer coverage are the same as in Option 1 (see Table 20). Beyond additional coverage, vessels will incur additional regulatory costs related to filing out Released catch Affidavits. Note that the requirement to exit the area is creates a disincentive to safety-at-sea.

Option 2A

The impacts of this option are similar to the previous option and depend largely on who is responsible for covering the costs of additional observer coverage.

Option 2B

The impacts of Option 2B are similar to that of 2A, except vessel have the flexibility to fish in the monitoring areas if an observer is unavailable.

Option 2C

The impacts of Option 2C are similar to the impacts of 1A. However, vessels may choose not to declare that they are on a herring trip, and be able to use the monitoring areas without a monitor.

Option 2D

The impacts of Option 2D are similar to the impacts of 1B. However, vessels may choose not to declare that they are on a herring trip, and be able to fish for other species in the monitoring areas without a monitor.

Table 20 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1A, if This Option had been Effective in 2010

Gear (ABC permits only)	Trips in Monitoring Areas	Percentage of total Trips	Days of Coverage Required
Trawl	298	64.6%	874
Purse Seine	45	22.3%	100
Total	343	51.7%	974

Table 21 Total Number of Trips and Number of Observer-Days Required to Meet Sub-Option 1B, if This Option had been Effective in 2010

Gear (ABCD permits)	Trips in Monitoring Areas	Percentage of total Trips	Days of Coverage Required
Trawl	311	61.5%	887
Purse Seine	45	22.3%	100
Total	356	50.3%	987

Table 22 Fishing Time (Hours) Inside and Outside the Monitoring Areas

		Fishing Time		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		2,617	330	2,947
TR	ABC	6,699	5,406	12,105
	D	227	71	298
Grand Total		9,544	5,807	15,351

Table 23 Fishing Time (%) Inside and Outside the Monitoring Areas

		Fishing Time (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		88.8%	11.2%	100.0%
TR	ABC	55.3%	44.7%	100.0%
	D	76.3%	23.7%	100.0%
Grand Total		62.2%	37.8%	100.0%

Table 24 Herring Catch (lbs.) Inside and Outside the Monitoring Areas

		Herring Catch		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		17,434,005	1,028,536	18,462,541
TR	ABC	67,237,466	56,866,383	124,103,849
	D	112,799	36,045	148,844
Grand Total		84,784,270	57,930,964	142,715,233

Table 25 Herring Catch (%) Inside and Outside the Monitoring Areas

		Herring Catch (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.4%	5.6%	100.0%
TR	ABC	54.2%	45.8%	100.0%
	D	75.8%	24.2%	100.0%
Grand Total		59.4%	40.6%	100.0%

Table 26 Herring Revenue ($) Inside and Outside the Monitoring Areas

		Herring Revenue		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		$2,783,152	$174,925	$2,958,078
TR	ABC	$9,270,814	$6,349,882	$15,620,696
	D	$18,792	$5,645	$24,437
Grand Total		12,072,759	6,530,452	18,603,211

Table 27 Herring Revenue (%) Inside and Outside the Monitoring Areas

		Herring Revenue (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.1%	5.9%	100.0%
TR	ABC	59.3%	40.7%	100.0%
	D	76.9%	23.1%	100.0%
Grand Total		64.9%	35.1%	100.0%

Table 28 Total Revenue ($) Inside and Outside the Monitoring Areas

		Total Revenue		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		$2,783,201	$174,928	$2,958,129
TR	ABC	$10,100,712	$7,992,356	$18,093,067
	D	$33,329	$9,683	$43,011
Grand Total		12917241.89	8176965.79	21094207.68

Table 29 Total Revenue (%) Inside and Outside the Monitoring Areas

		Total Revenue (%)		
Gear	Category	Not Monitored	Monitored	Grand Total
PUR		94.1%	5.9%	100.0%
TR	ABC	55.8%	44.2%	100.0%
	D	77.5%	22.5%	100.0%
Grand Total		61.2%	38.8%	100.0%

Category A/B Versus Category C and Category D Vessels

As discussed throughout this document, there are costs associated with incorporating a greater number of vessels into a comprehensive monitoring program, especially if there is an industry-funded element of the monitoring program. The goals and objectives of the monitoring program should be weighed against the costs of monitoring to the vessels and the degree of participation in the fishery.

To further investigate differential impacts by herring permit category, herring catch and revenues from these vessels inside and outside the proposed monitoring areas are summarized by permit category in Table 30. While 22-24% of the Category D effort, catch, and revenues are derived from the monitoring areas, the magnitude of effort, catch, and revenues attributable to Category D vessels is minimal. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas. Table 30 shows the potential impact of the monitoring areas on Category C vessels and the other fisheries on which they rely. While Category A vessels will be most affected because they catch the majority of herring, Category C vessels derive about 20% of their total revenues from all fisheries from the proposed monitoring areas. Should the monitoring measures become too costly for the Category C vessels to fish in these areas, they will likely lose revenues from other fisheries where herring may be caught incidentally.

Table 30 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Monitoring Areas by Limited Access Herring Permit Category

Permit Cat.	No. Vessels	Inside/ Outside	Hours Fished	Herring Catch (millions pounds)	Herring Revenue (millions dollars)	Total Revenue (millions dollars)
A	27	Outside	10,575	100.38	$13.77	$14.76
A	22	Inside	3,553	39.17	$4.36	$5.81
B	2	Outside	Cannot report	Cannot report	Cannot report	Cannot report
B	3	Inside	354	1.56	$0.17	$0.17
C	3	Outside	382	0.96	$0.23	$0.25
C	5	Inside	177	0.44	$0.04	$0.06
D	6	Outside	227	0.11	$0.02	$0.03
D	5	Inside	71	0.04	$0.01	$0.01

5.3 IMPACTS OF TRIGGER-BASED MONITORING APPROACHES

Option 3: Trigger-Based Monitoring

This options establishes triggers, based on catch of river herring in three broad areas (CC, GOM, and SNE). There are three sets of options under consideration to establish river herring catch triggers, based on Maximum, Median, and Mean river herring removals estimated by the Herring PDT.

The first stage in assessing the impact of Trigger-Based Monitoring is to estimate when the triggers are likely to be reached. Use of VTR only is problematic, because river herring catch may not be accurately recorded in VTR. Therefore, a simulation based approach which combines VTR and observer bycatch rates is used.

Methods

The 2008-2010 VTR data is the core of the data used for this simulation exercise. Sail date, herring catch, gear type, and statistical area were extracted from these records. Paired and midwater trawl were aggregated. The 2005-2010 observer data forms the second piece of data used in this simulation exercise. Total herring catch, river herring catch, statistical area, and gear were extracted from these records at the trip level. From this data, a river herring bycatch ratio (river herring/total herring) was calculated for each trip. A trip, instead of a haul, was used as a unit of observation for two reasons. First, VTR records are trip level, not haul level. Second, it is likely that if a large bycatch haul of river herring occurs, a vessel will switch locations and it would be inappropriate to assume that a vessel would continue to catch river herring.

For each experiment, one-third of the VTR records were randomly selected; this corresponds to approximately one "year" of fishing. Each VTR record was randomly matched to a river herring bycatch rate which occurred in the same monitoring area and used the same fishing gear. While time of year was not used as a matching variable, there is high correlation between fishing areas and time of year. For each VTR record, the (experimental) river herring catch was calculated by multiplying the bycatch rate by the VTR herring catch.

A running total of Atlantic herring catch in each management area was created from the selected VTR herring catch and a management area was 'closed' if the Atlantic herring catch exceeded the sub-TACs/ACLs listed in the 2010-2012 herring fishery specifications package. A running total of river herring catch in each of the three monitoring areas was also created from the river herring bycatch. The date at which the trigger was then computed.

These experiments were repeated 1,000 times to create a distribution of trigger dates for each of the sub-options.

Finally, to illustrate how the triggered options might work with less than 100% observer coverage, the set of experiments was repeated using a 50% coverage rate over all of the fishing fleets. Prior to matching VTR to the river herring bycatch rates, a trip is randomly assigned to be observed or not observed. If a trip is not observed, it is assigned an "assumed" bycatch rate based on the year-to-date observed bycatch rate. This assumed bycatch rate is gear and monitoring-area specific. The remainder of the experiment is unchanged.

The results are summarized using the cumulative distribution of the trigger dates. For a given date, the probability that the trigger was reached can be found by reading up to the vertical line in the graph. There

is a vertical line on the final day of the fishing year in all graphs. This does not mean that the triggers are reached on the final day; instead, this is used to provide some perspective about the frequency that a trigger is not reached.

Reporting Option 1:

Reporting Option 1 imposes some administrative and regulatory burden on fishing vessels.

Reporting Option 2:

Reporting Option 2 also imposes some administrative and regulatory burden on fishing vessels.

Trigger Option 3A (Max):

See Figure 36 – Figure 41 for illustrative examples of the potential impacts of using the distribution max for the river herring catch trigger. Under Option 3A, with 100% observer coverage, the Cape Cod and Gulf of Maine triggers are unlikely to be reached; the triggers in those regions were reached in 5% and 4% of experiments (Figure 36 and Figure 37). When reached, the triggers were reached late in the fishing year. However, the triggers were reached in 46% of the experiments in the Southern New England region. The fishery is prosecuted in the winter; therefore, the triggers are likely to be reached either in the beginning of the year or at the end of the year.

Under Option 3A with 50% observer coverage, the same qualitative pattern occurs: low probability of the trigger being reached in the Cape Cod or Gulf of Maine regions and a relatively high probability in the Southern New England area.

Trigger Option 3B (Median):

See Figure 42 – Figure 47 for illustrative examples of the potential impacts of using the distribution median for the river herring catch trigger. Under Option 3B, with 100% observer coverage, all triggers likely to be reached. The triggers in CC, GOM, and SNE were reached in 60%, 86%, and 77% of experiments respectively. (Figure 42 – Figure 47). The triggers in GOM and CC are likely to be reached at various times through the fishing year. The triggers in the Southern New England region again are likely to be reached either in the beginning of the year or at the end of the year.

Under Option 3B, with 50% observer coverage, the same qualitative pattern occurs. The triggers in CC, GOM, and SNE were reached in 52%, 78%, and 62% of experiments respectively.

Trigger Option 3C (Mean):

See Figure 48 – Figure 53 for illustrative examples of the potential impacts of using the distribution median for the river herring catch trigger. Under Option 3C, with 100% observer coverage, all triggers likely to be reached. The triggers in CC, GOM, and SNE were reached in 27%, 67%, and 93% of experiments respectively. (Figure 48 – Figure 53). The triggers in GOM and CC are likely to be reached at various times through the fishing year. The triggers in the Southern New England region again are likely to be reached either in the beginning of the year or at the end of the year.

Under Option 3C, with 50% observer coverage, the same qualitative pattern occurs. The triggers in CC, GOM, and SNE were reached in 25%, 60%, and 80% of experiments respectively.

General Impacts:

The impacts of triggered closures are difficult to predict because it is difficult to know when these triggers would be achieved. The largest potential impacts are likely to be in the Southern New England areas

because there is a large amount of overlap between the Protection areas and the fishery (see Figure 20 – Figure 27). Under these options, it is likely that all participants would undertake additional effort to avoid river herring in general. Therefore, it is reasonable to expect that this analysis somewhat **over-estimates** the probability that any trigger would be reached. However, it is not clear how effective the fishery is at avoiding river herring while continuing to harvest Atlantic herring.

Option 3A is likely to have the smallest negative impacts on the entire fishery. Option 3B is likely to have the largest impact on the fishery which uses the Cape Cod and Gulf of Maine areas and the 2nd smallest impact on the participants which use the Southern New England area. Option 3C is likely to have the next smallest impact on the parts of the fishery which operate in the Cape Cod and Gulf of Maine areas and the largest impact on part of the fishery which use the Southern New England areas.

Figure 36 Probability of Gulf of Maine (Max) Trigger Being Exceeded with 100% Observer Coverage

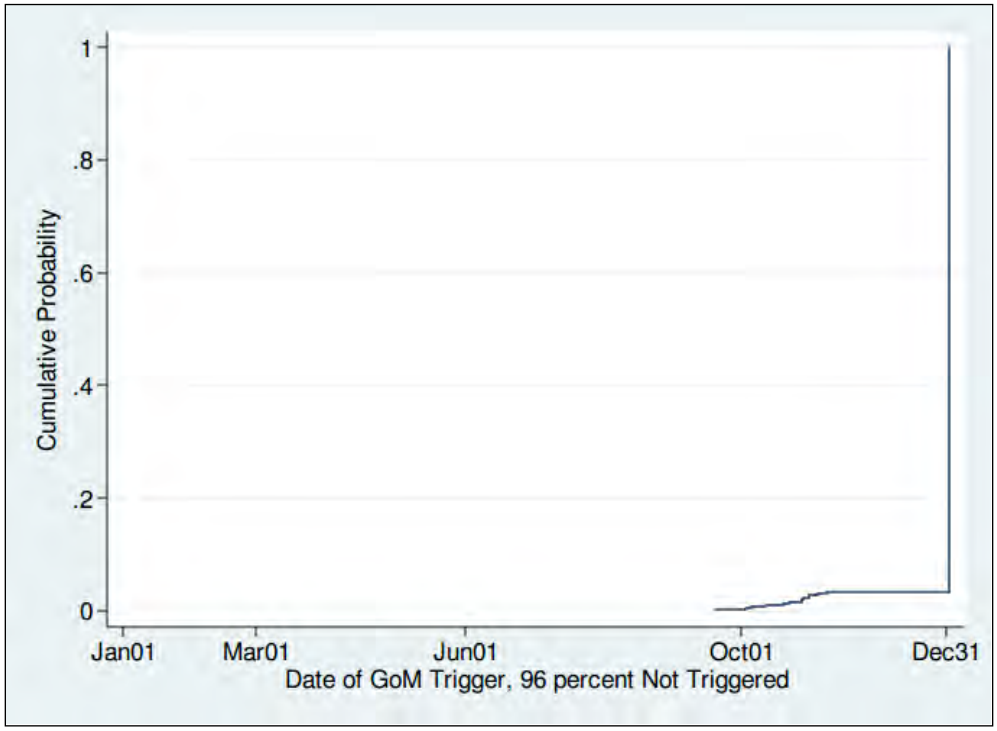


Figure 37 Probability of Cape Cod (Max) Trigger Being Exceeded with 100% Observer Coverage

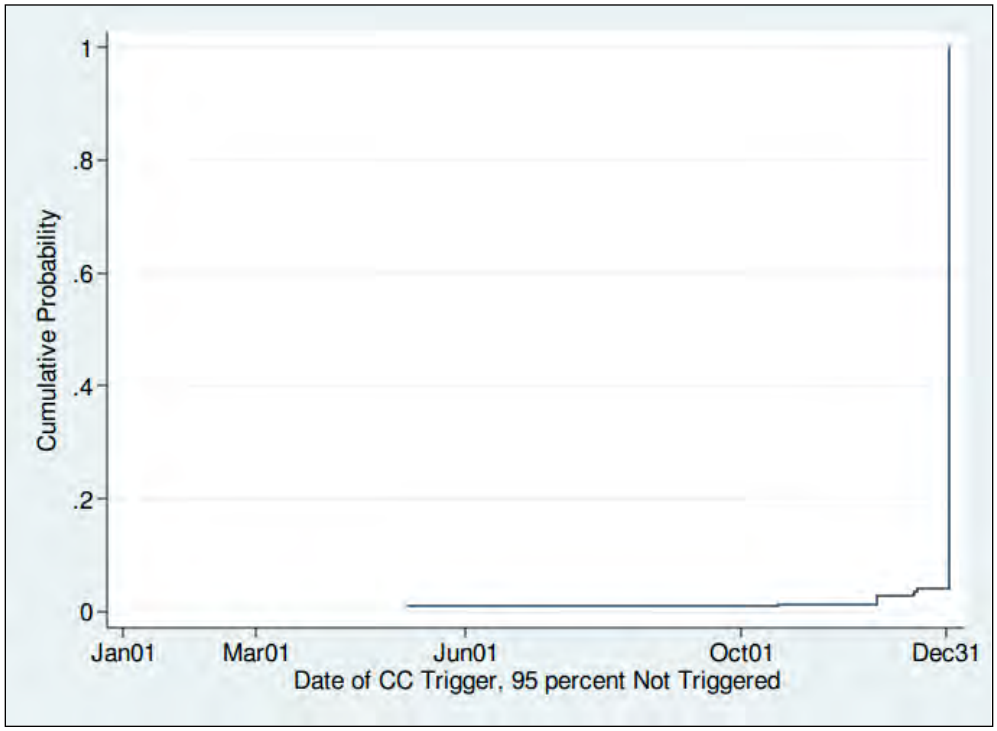


Figure 38 Probability of Southern New England (Max) Trigger Being Exceeded with 100% Observer Coverage

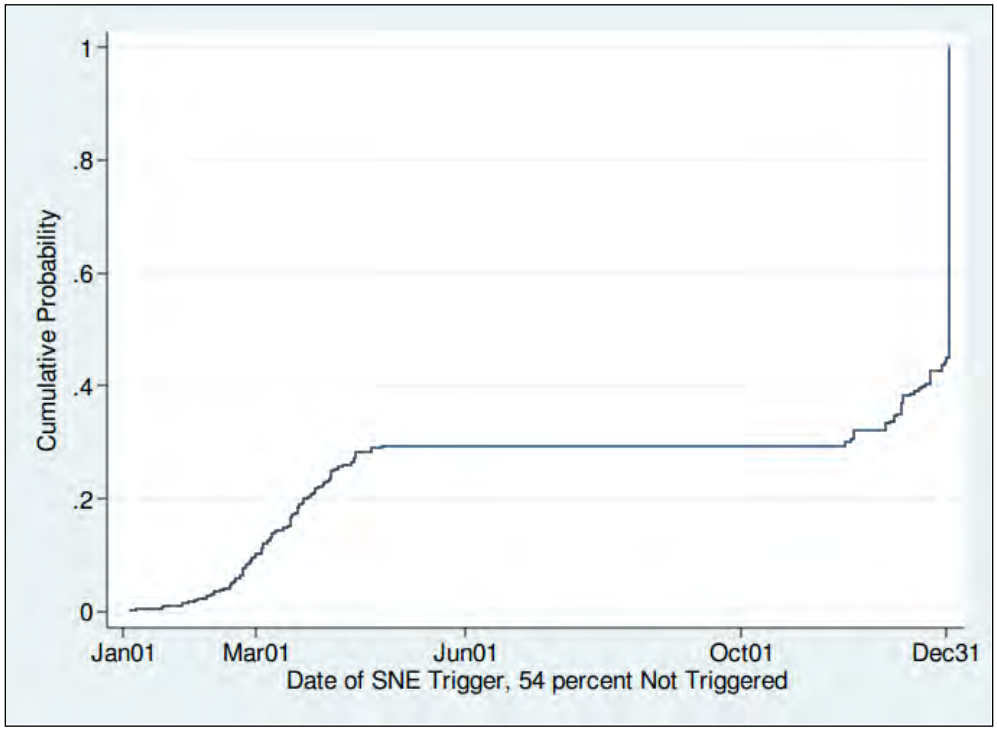


Figure 39 Probability of Gulf of Maine (Max) Trigger Being Exceeded with 50% Observer Coverage

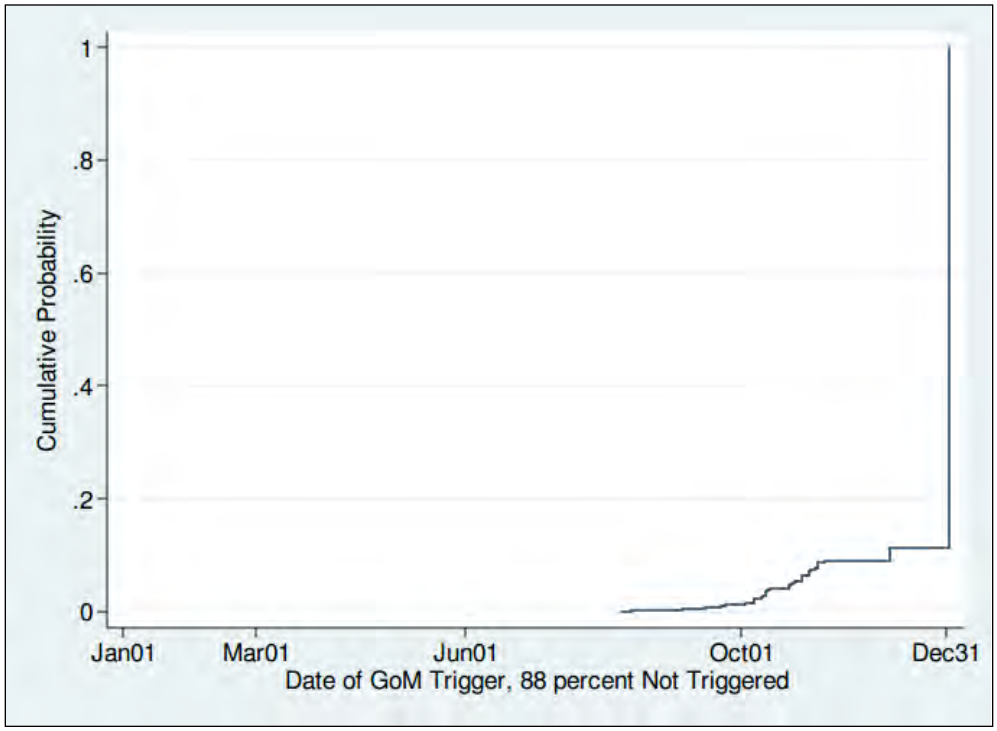


Figure 40 Probability of Cape Cod (Max) Trigger Being Exceeded with 50% Observer Coverage

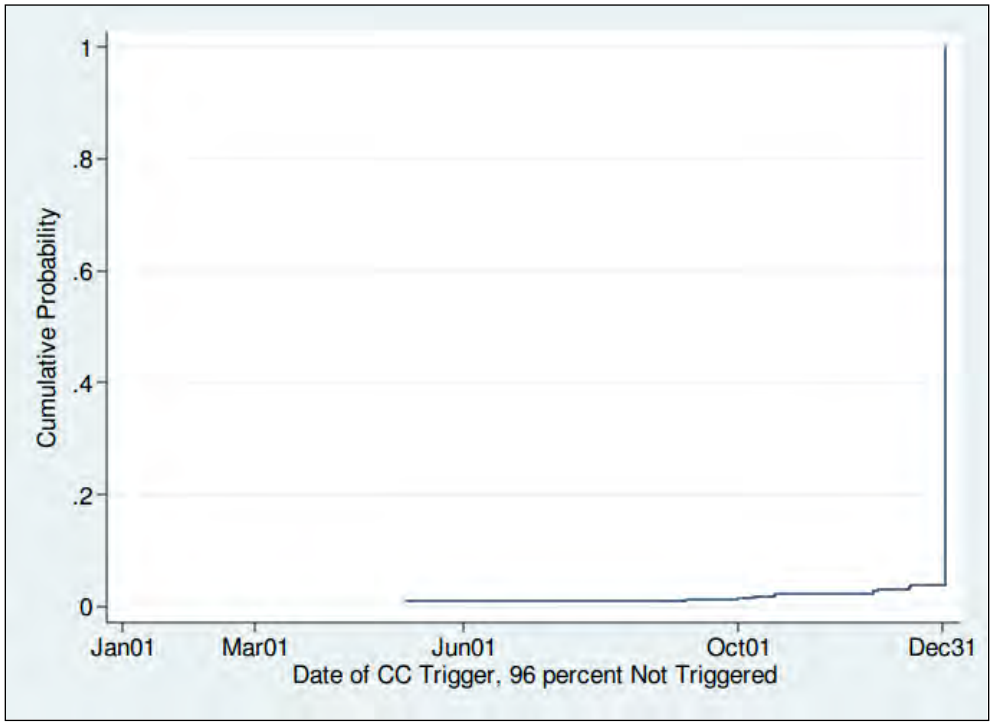


Figure 41 Probability of Southern New England (Max) Trigger Being Exceeded with 50% Observer Coverage

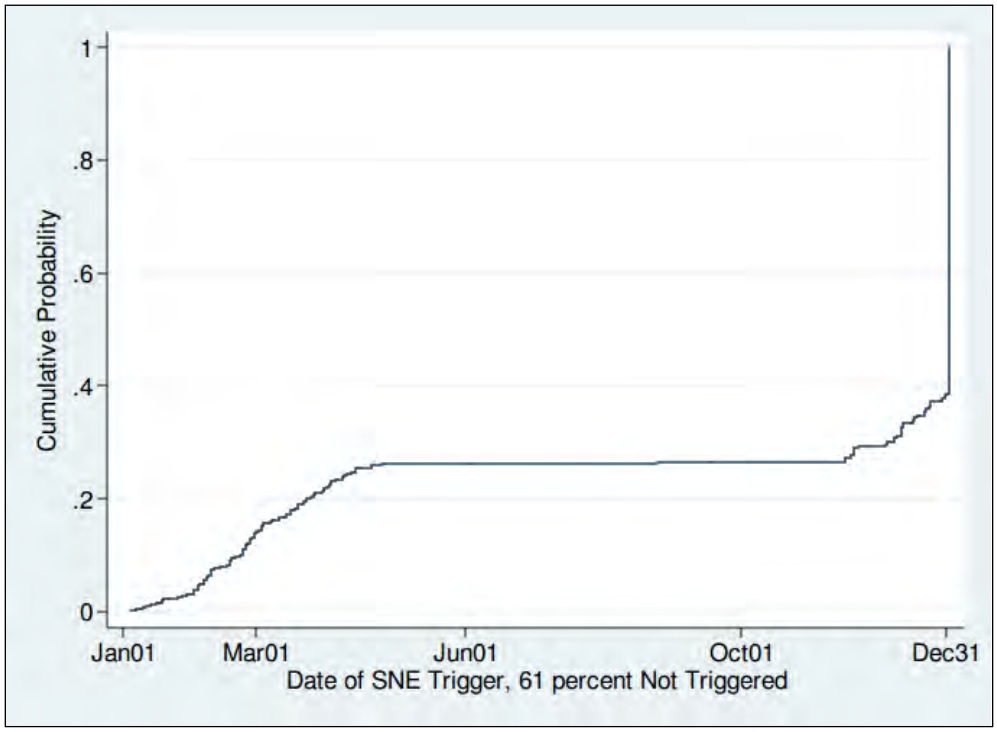


Figure 42 Probability of Gulf of Maine (Median) Trigger Being Exceeded with 100% Observer Coverage

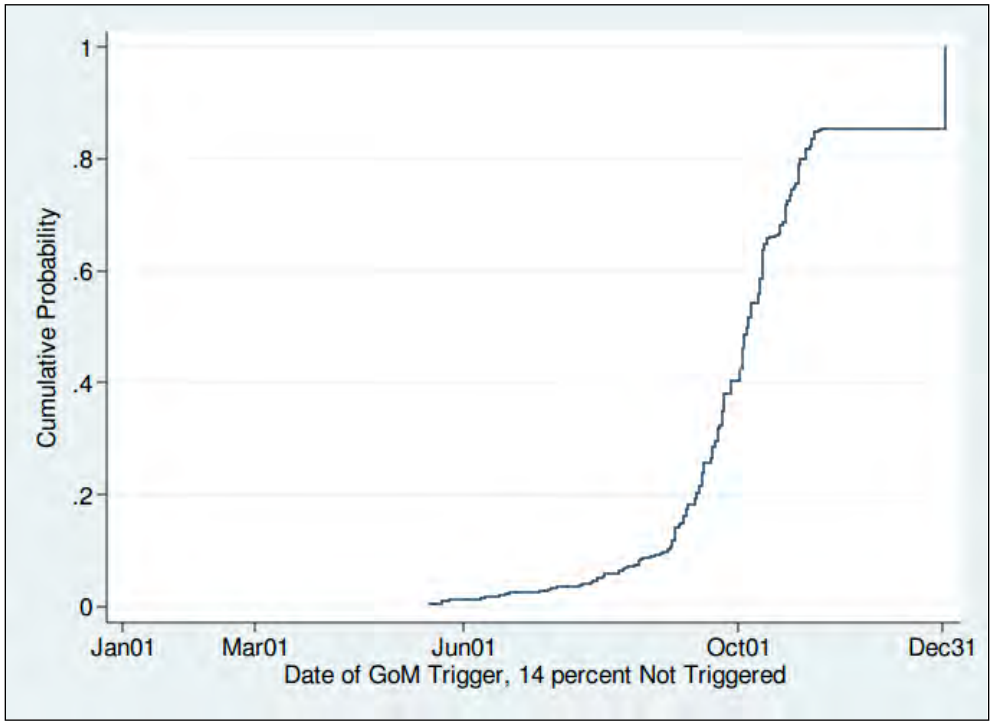


Figure 43 Probability of Cape Cod (Median) Trigger Being Exceeded with 100% Observer Coverage

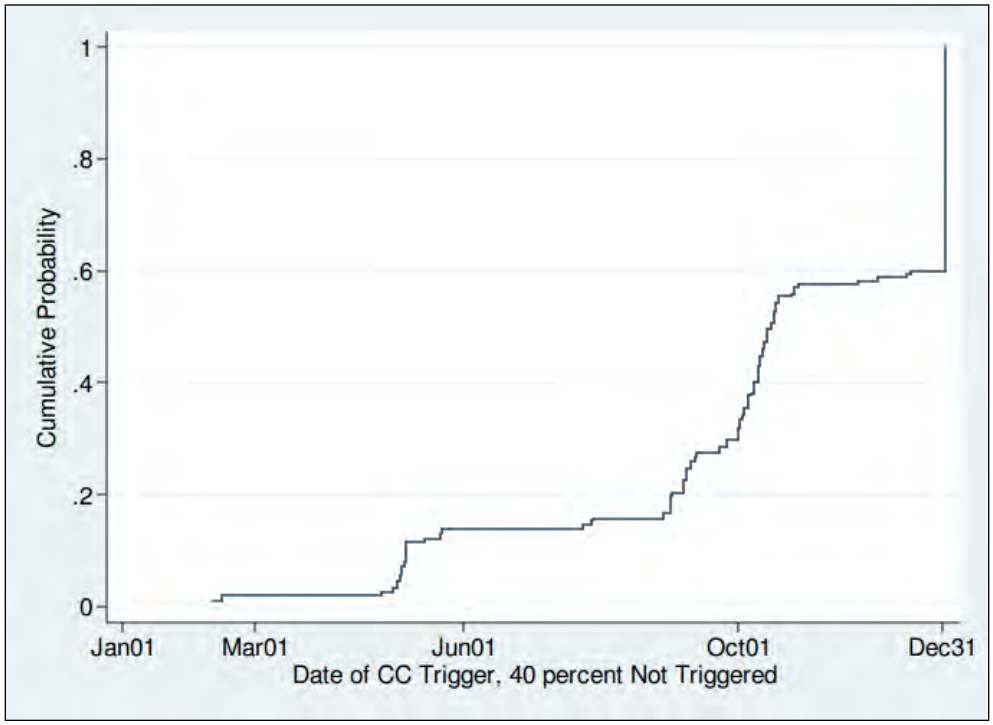


Figure 44 Probability of Southern New England (Median) Trigger Being Exceeded with 100% Observer Coverage

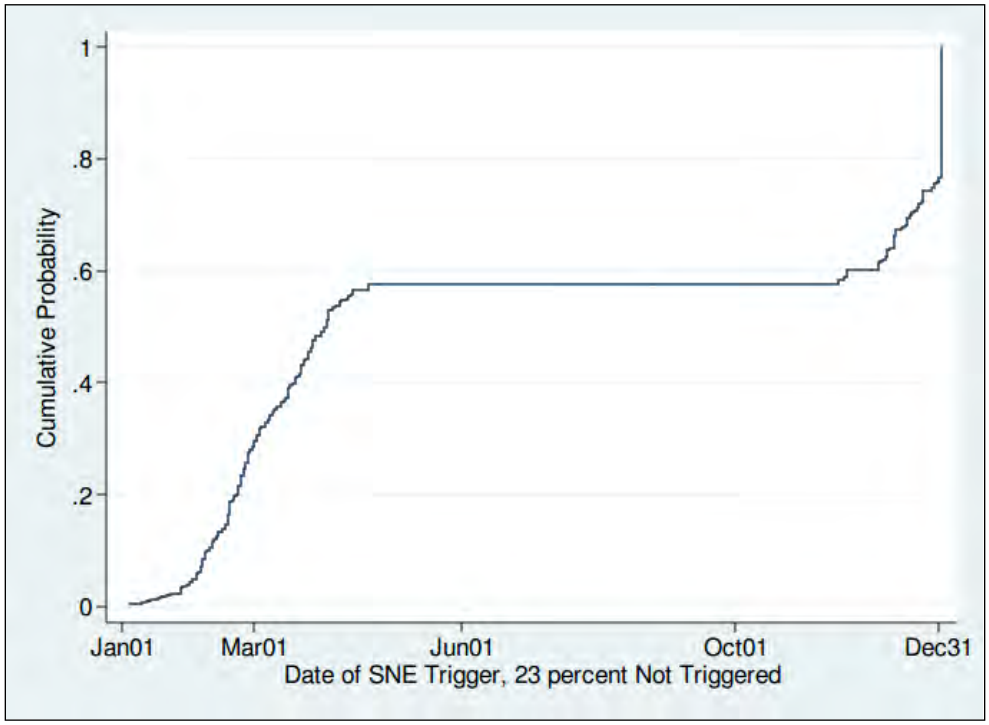


Figure 45 Probability of Gulf of Maine (Median) Trigger Being Exceeded with 50% Observer Coverage

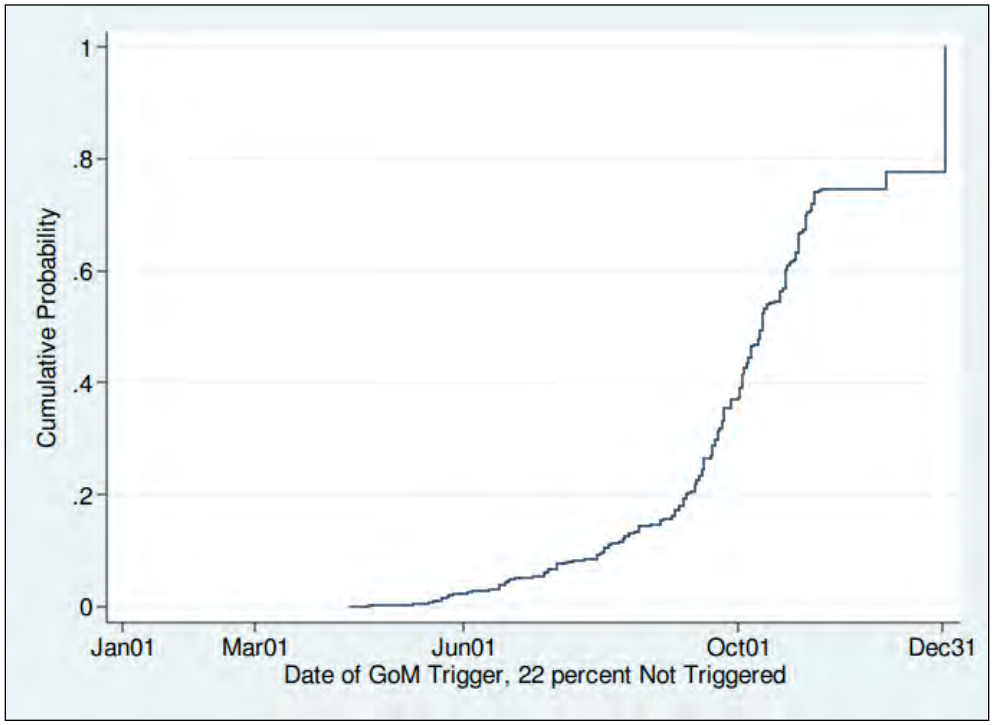


Figure 46 Probability of Cape Cod (Median) Trigger Being Exceeded With 50% Observer Coverage

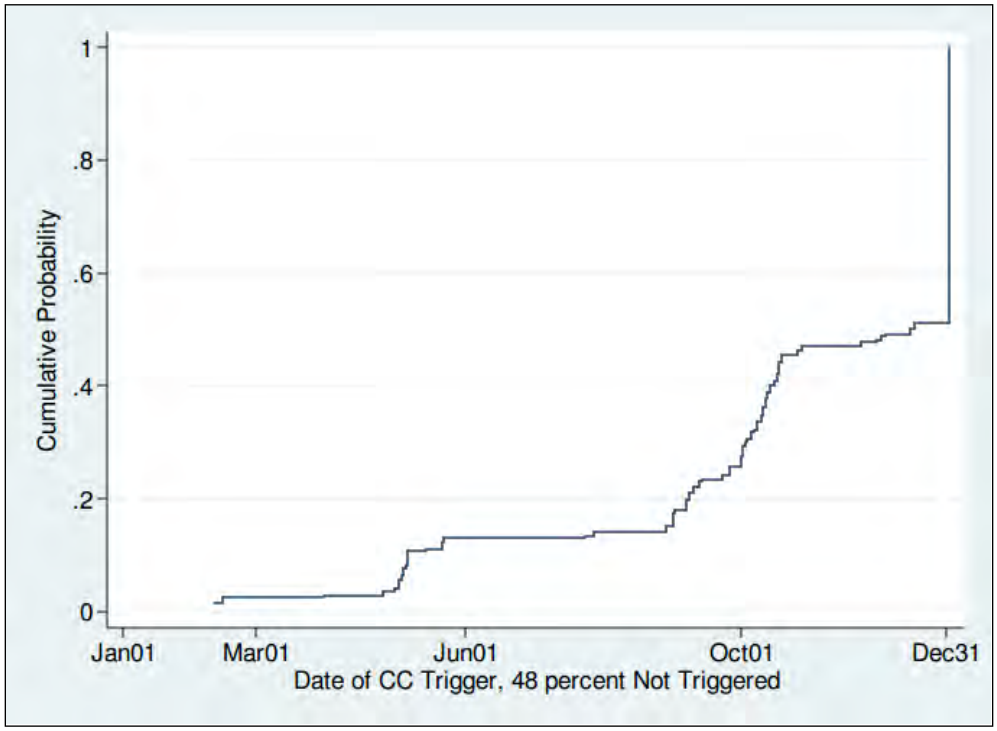


Figure 47 Probability of Southern New England (Median) Trigger Being Exceeded With 50% Observer Coverage

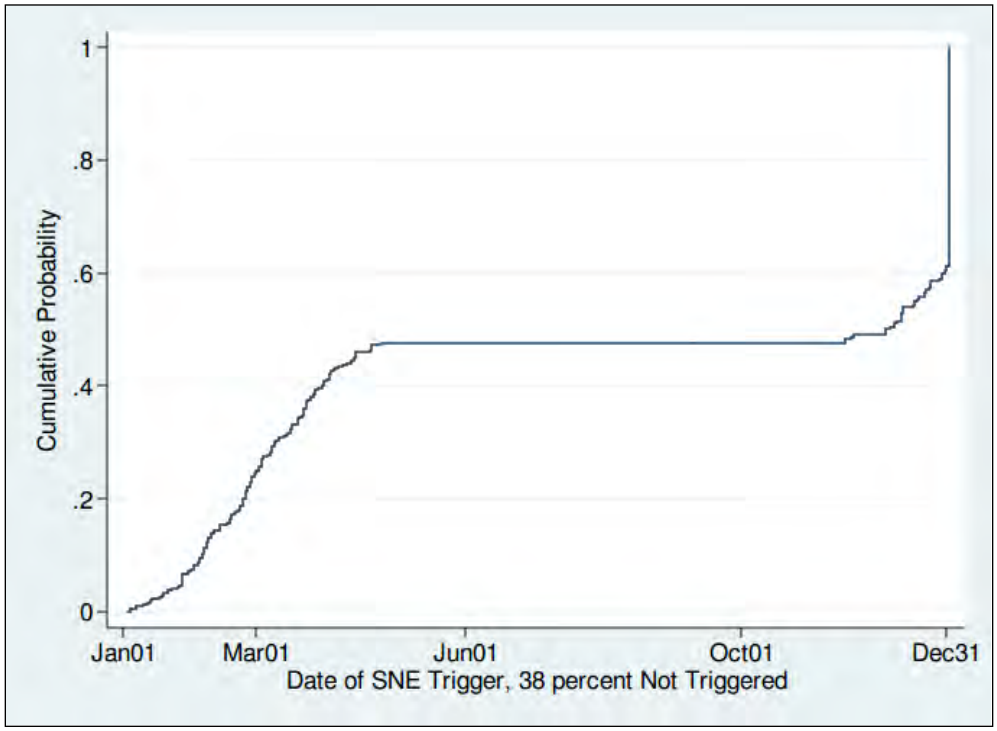


Figure 48 Probability of Gulf of Maine (Mean) Trigger Being Exceeded With 100% Observer Coverage

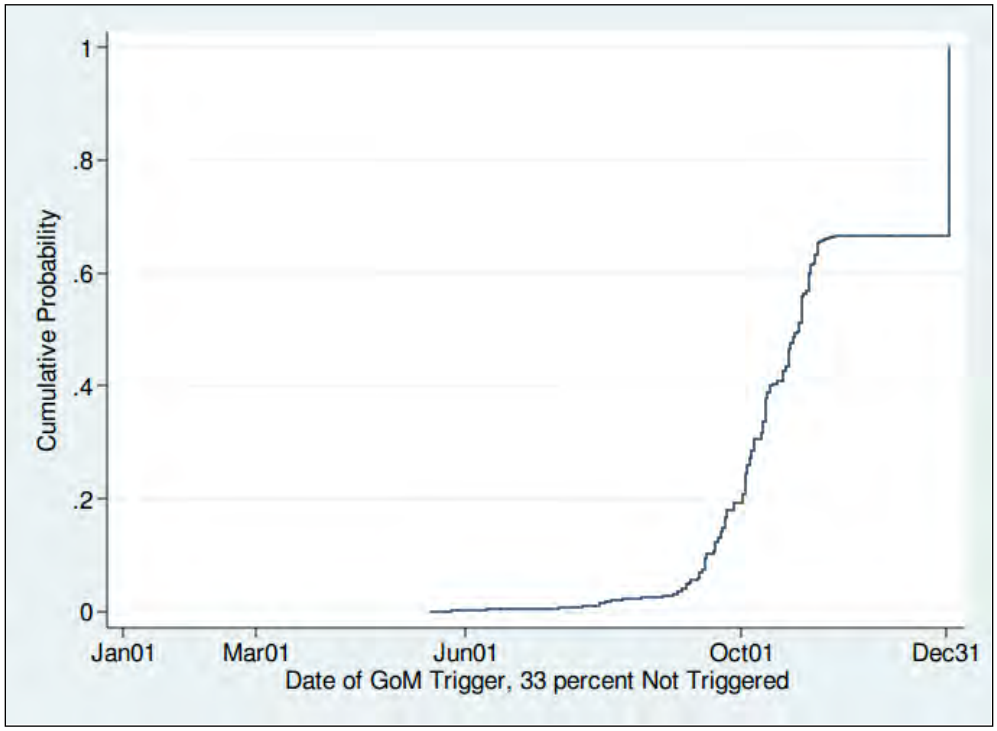


Figure 49 Probability of Cape Cod (Mean) Trigger Being Exceeded With 100% Observer Coverage

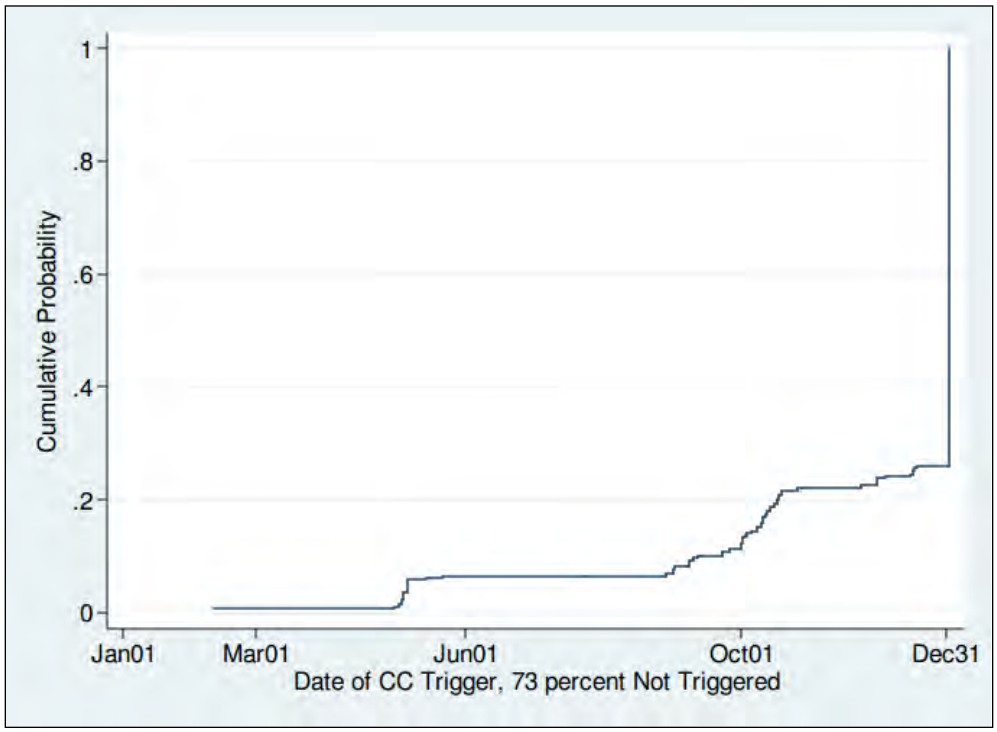


Figure 50 Probability of Southern New England (Mean) Trigger Being Exceeded With 100% Observer Coverage

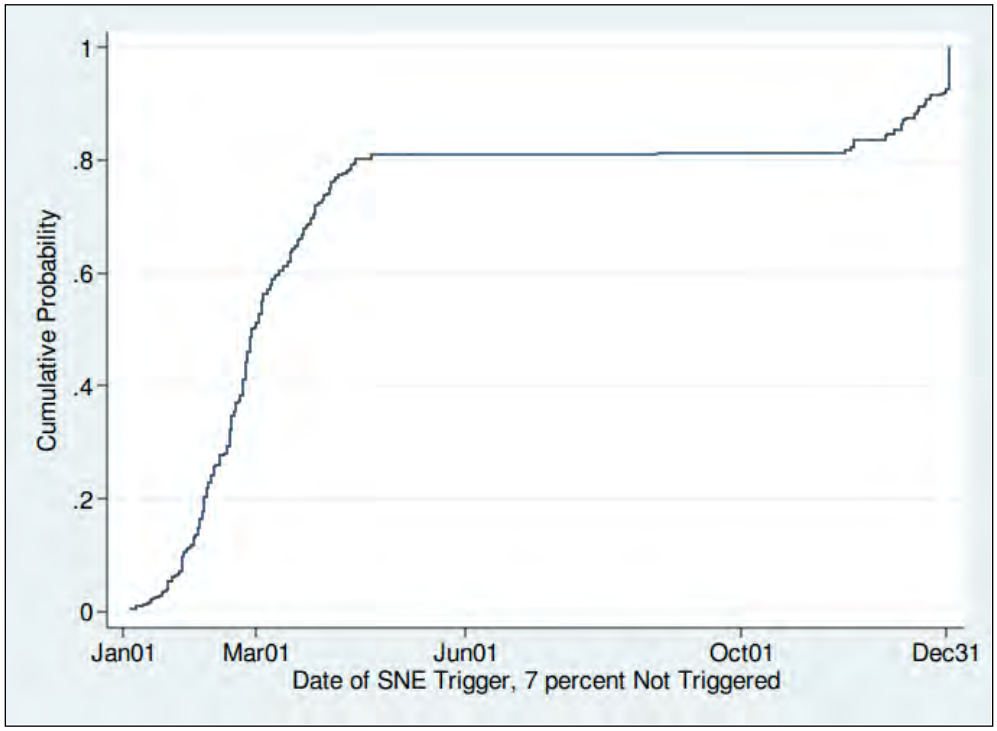


Figure 51 Probability of Gulf of Maine (Mean) Trigger Being Exceeded With 50% Observer Coverage

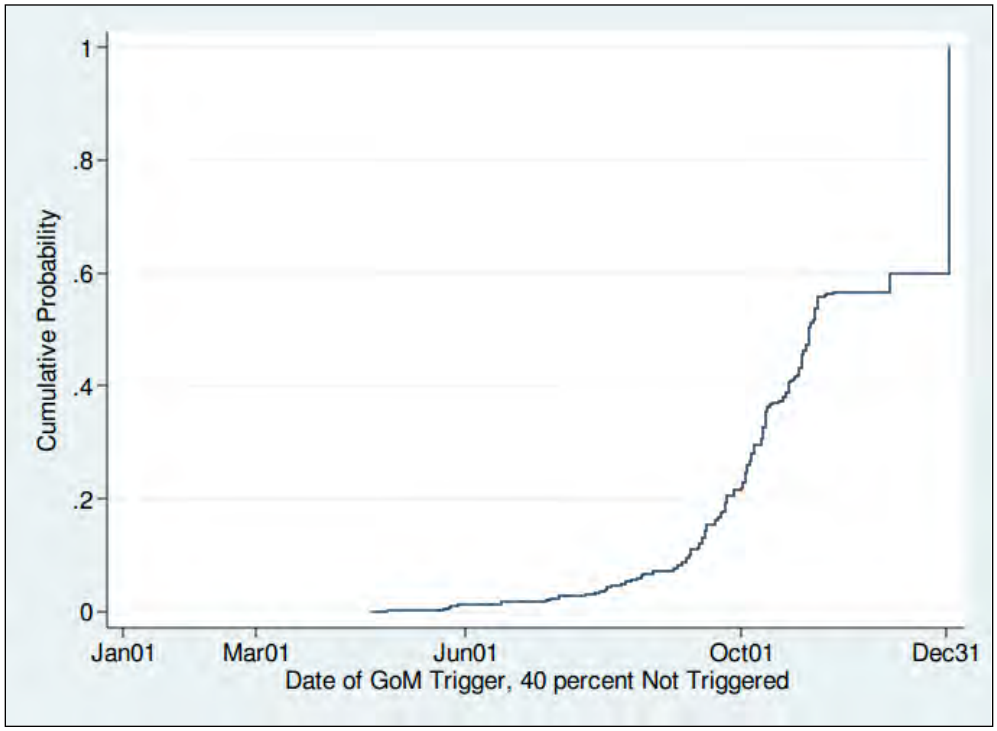


Figure 52 Probability of Cape Cod (Mean) Trigger Being Exceeded With 50% Observer Coverage

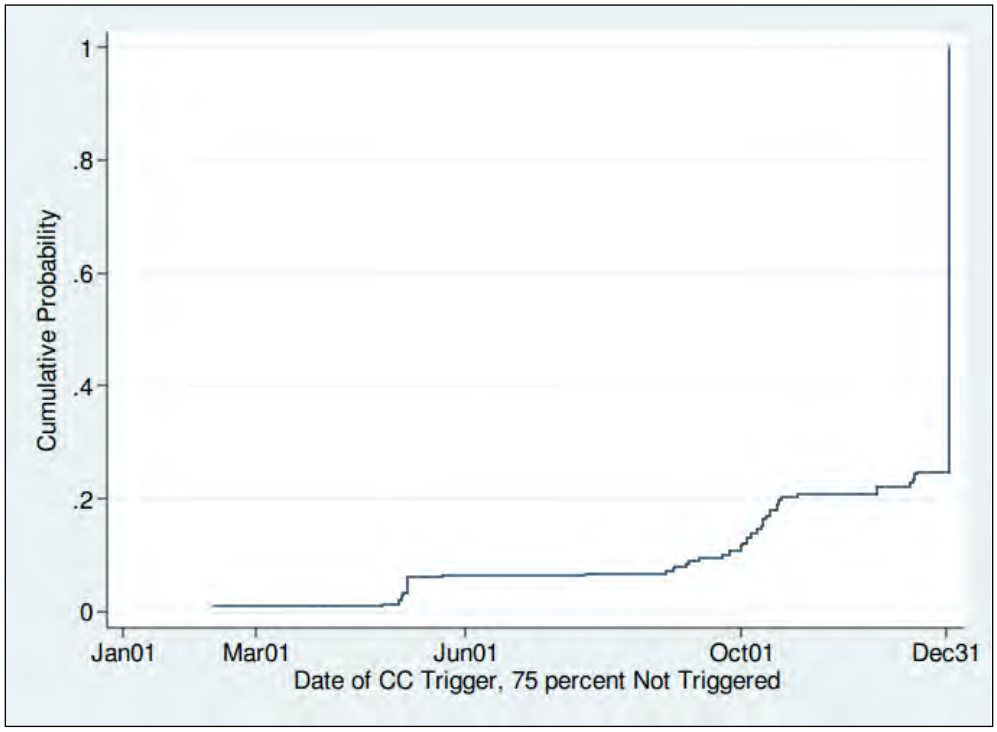
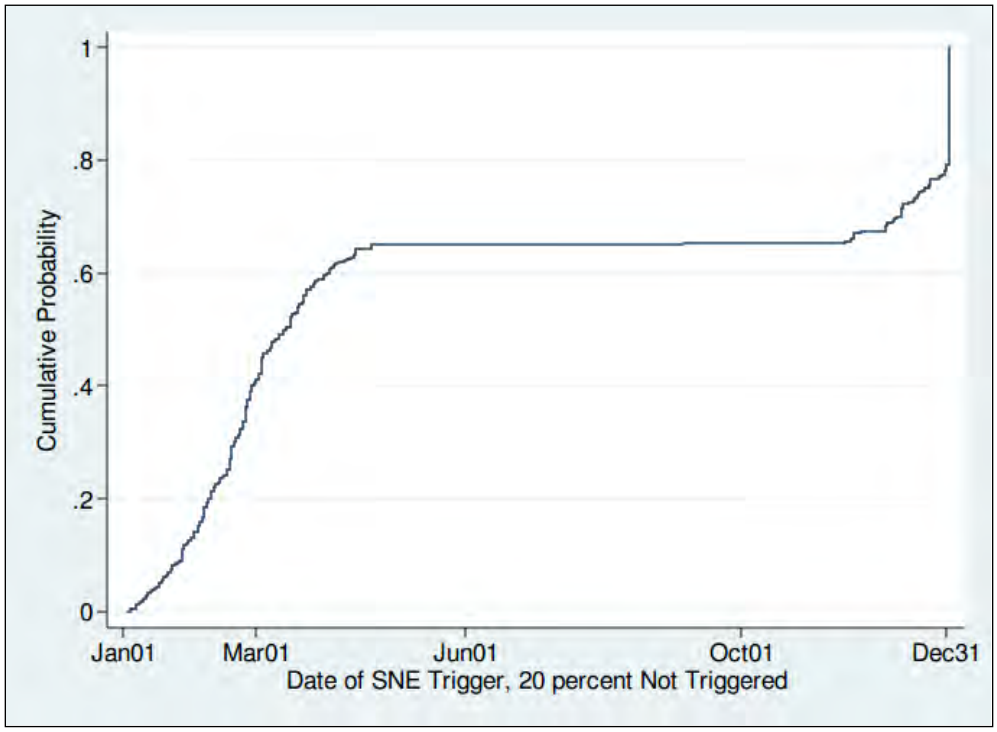


Figure 53 Probability of Southern New England (Mean) Trigger Being Exceeded With 50% Observer Coverage



6.0 ANALYSIS OF THE RIVER HERRING PROTECTION AREAS (ALTERNATIVE 3)

6.1 QUALITATIVE ASSESSMENT

The river herring protection areas options were compared to other areas identified using research surveys. The survey-based areas provide information on the times and areas were river herring are likely to be encountered absent information from the fishery. Additional information/analyses provided by the Herring PDT can be found in Volume II, Appendix III (Herring PDT Analysis: Development of Measures to Address River Herring Bycatch).

Table 31 – Table 34 and associated Figure 55 – Figure 58 provide a comparison of the bimonthly river herring protection areas to associated survey areas. Each area is referenced as A- BB, with a map of all of these areas combined (Figure 54). The number of NEFOP data points used to identify each protection area (fishery-based areas) are provided in Table 31 – Table 34. Further, the number of NMFS bottom-trawl surveys used to identify survey-based areas are found within hatched areas in Figure 55 – Figure 58. Several questions were asked to qualitatively compare fishery-based and survey-based areas:

1) Are there any adjacent fishery-based areas?
2) Are there any adjacent survey-based areas?
3) Does the fishery-based area overlap a survey-based area?

Adjacency was defined as areas sharing a side and/or corner. The results of this analysis for each bimonthly period are summarized in Table 31 – Table 34. One important caveat, noted above, is that the winter survey does not cover the Gulf of Maine.

Alternative 3: Option 1

The potential benefit of the bimonthly protection areas is that they provide river herring mortality protection during at-sea migrations by closing specific river herring fishery-based encounter hotspots. Such an approach could lead to reductions in at-sea river herring mortality. However, with fixed bimonthly protection areas, there would not be river herring mortality protection outside of protection areas. Therefore, areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect river herring year-to-year variability.

Alternative 3: Option 2

The potential benefit of the bimonthly triggered protection areas is that they provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots upon reaching a river herring catch trigger. This may lead to possible reductions in river herring mortality. However, there would be no river herring mortality protection outside of the areas. Likewise, triggered protection areas might not be put in place quickly enough to be at the pace with river herring migratory patterns.

Table 31 Comparison of River Herring Protection for January-February (Fishery-Based Areas) with Winter Survey-Based Areas

	Protection Areas January - February							
Map reference	J	K	L	P	S	T	X	Y
Quarter-degree square	41694	41712	41711	40714	40732	40731	39733	39724
How many observer tows were greater than 1233 lbs of river herring?	3	3	12	3	1	4	2	3
Are there any adjacent fishery-based areas?	NO	YES	YES	YES	YES	YES	YES	YES
Are there any adjacent winter survey-based areas?	NO	YES	YES	YES	YES	YES	YES	YES
Does the fishey-based area overlap a survey-based area?	NO	NO	NO	YES	NO	NO	YES	NO

Table 32 Comparison of River Herring Protection for March-April (Fishery-Based Areas) with Spring Survey-Based Areas

	Protection Areas March - April	
Map reference	S	V
Quarter-degree square	40732	40721
How many observer tows were greater than 1233 lbs of river herring?	1	1
Are there any adjacent fishery-based areas?	NO	YES
Are there any adjacent spring survey-based areas?	YES	YES
Does the fishey-based area overlap a survey-based area?	NO	YES

Table 33 Comparison of River Herring Protection for September-October (Fishery-Based Areas) with Fall Survey-Based Areas

	Protection Areas September - October
Map reference	G
Quarter-degree square	42704
How many observer tows were greater than 1233 lbs of river herring?	5
Are there any adjacent fishery-based areas?	NO
Are there any adjacent fall survey-based areas?	YES
Does the fishey-based area overlap a survey-based area?	YES

Table 34 Comparison of River Herring Protection for November-December (Fishery-Based Areas) with Fall and Winter Survey-Based Areas

	Protection Areas November - December					
Map reference	G	I	J	K	L	R
Quarter-degree square	42704	42701	41694	41712	41711	40703
How many observer tows were greater than 1233 lbs of river herring?	10	1	8	1	1	1
Are there any adjacent fishery-based areas?	YES	YES	YES	YES	YES	NO
Are there any adjacent fall survey-based areas?	YES	YES	YES	YES	YES	YES
Are there any adjacent winter survey-based areas?	NO	NO	NO	YES	YES	YES
Does the fishey-based area overlap a fall survey-based area?	YES	YES	NO	NO	YES	NO
Does the fishey-based area overlap a winter survey-based area?	NO	NO	NO	NO	NO	NO

Figure 54 Map of River Herring Protection Areas for All Months Combined

Individual areas (grey blocks) are identified G-Y.

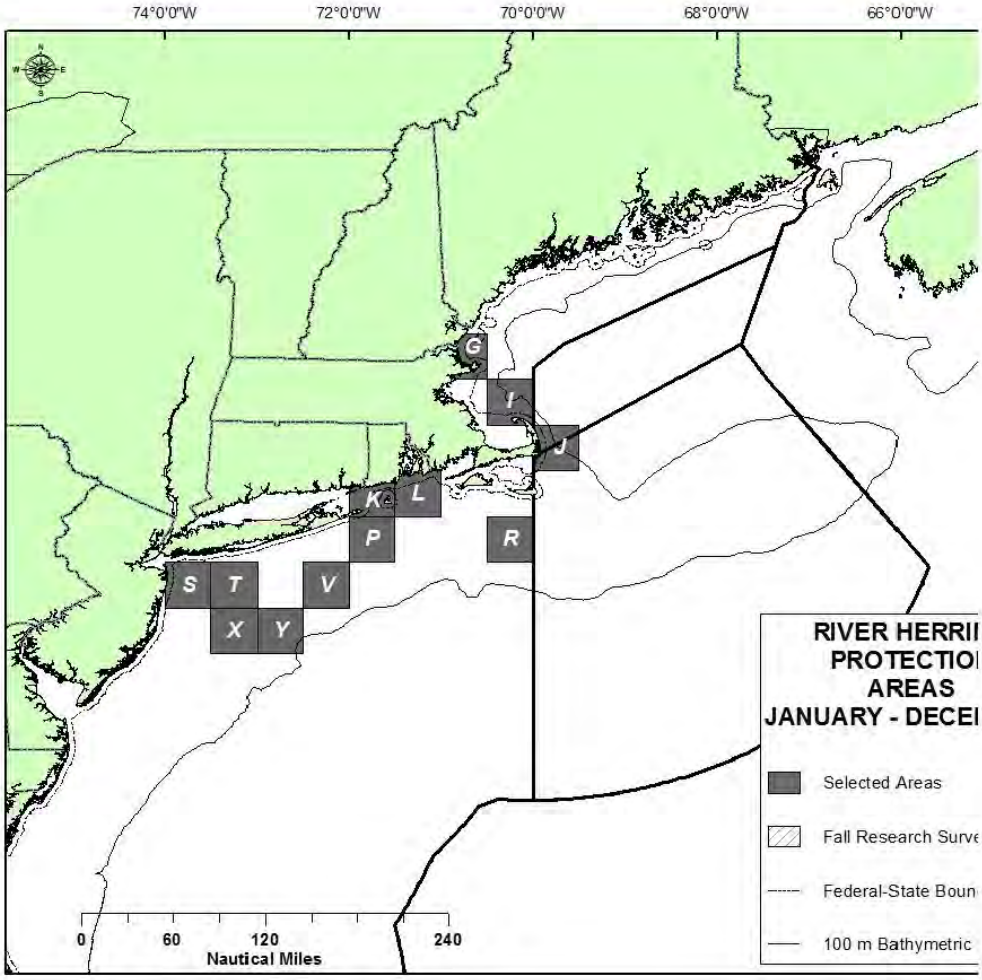


Figure 55 Map of River Herring Protection Areas for January - February (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

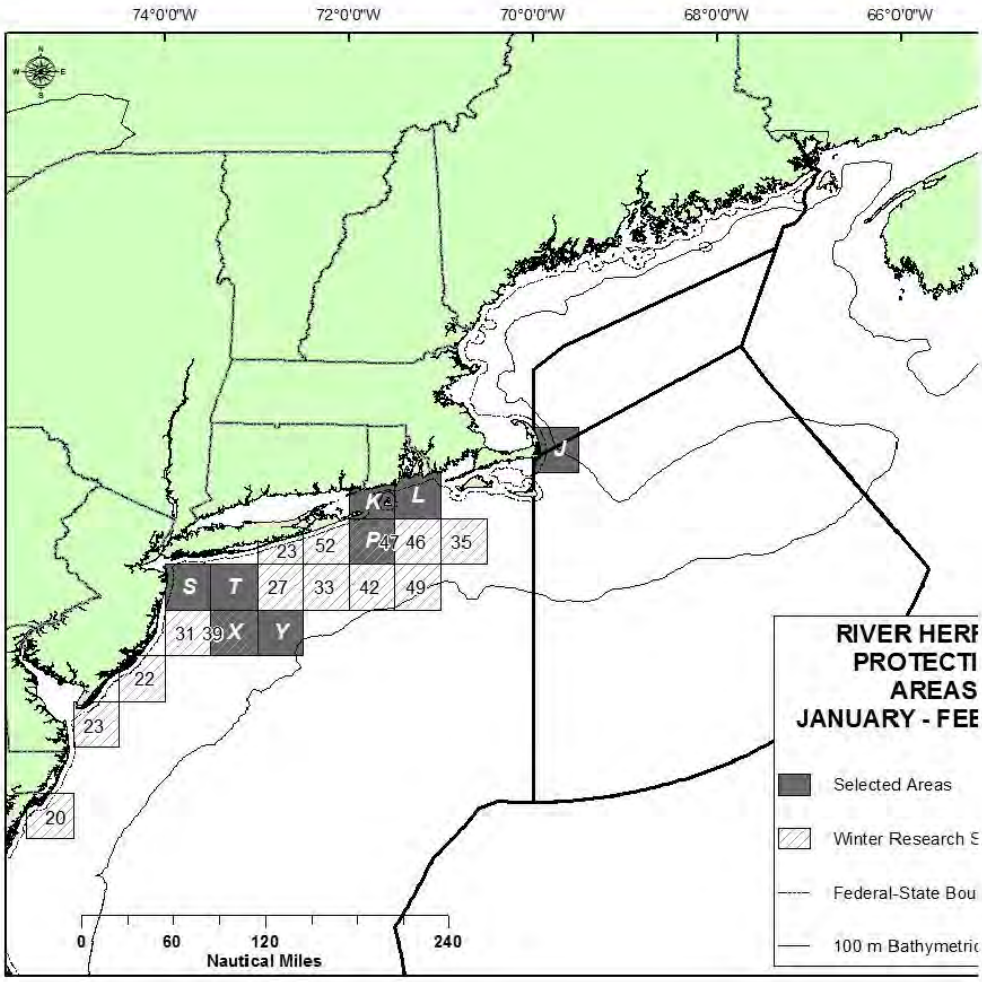


Figure 56 Map of River Herring Protection Areas for March - April (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

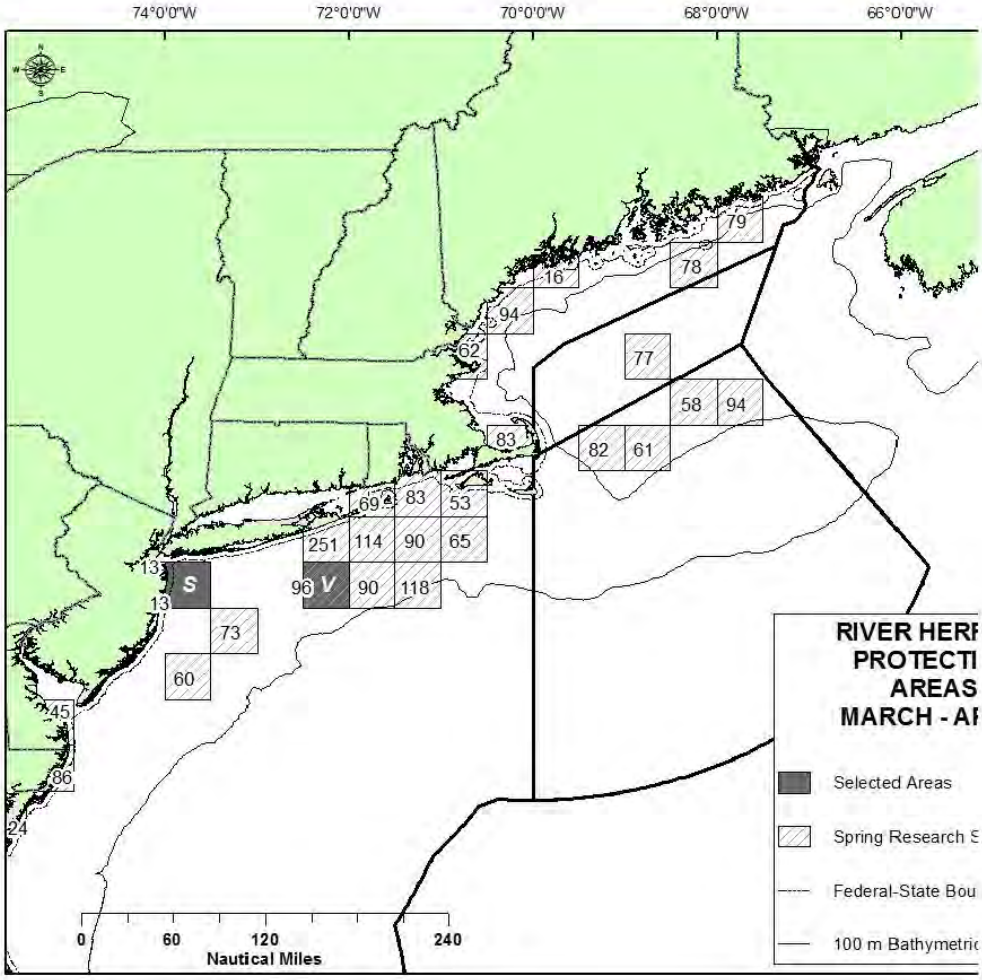


Figure 57 Map of River Herring Protection Areas for September – October (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.

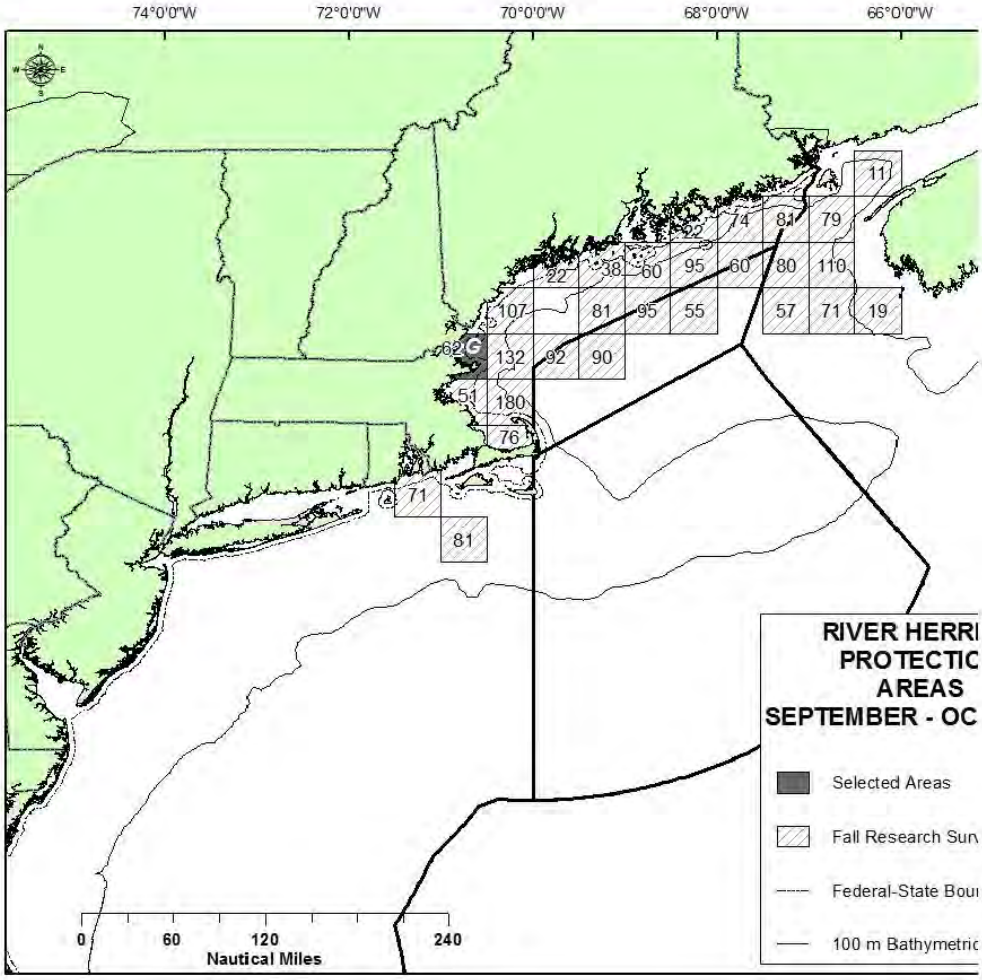
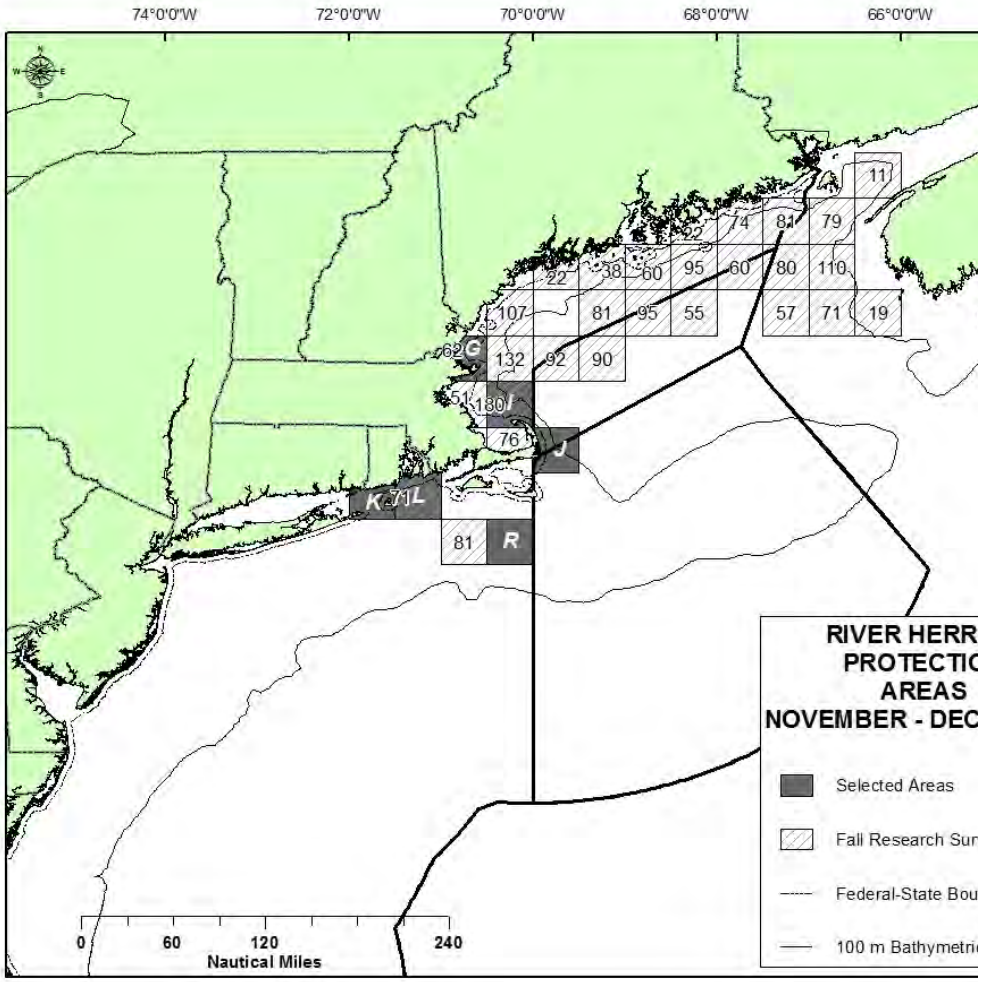


Figure 58 Map of River Herring Protection Areas for November – December (Gray Blocks) Overlaid with Survey Hotspot Areas (Hatched Blocks)

Numbers within blocks indicate the number of survey tows used in the hotspot analysis.



6.2 IMPACTS OF SPATIAL CLOSURES

Alternative 3: River Herring Protection

Section 3.0 describes the general methods used to map the directed Atlantic herring fishery in relation to the proposed River Herring Protection Areas.

Economic Impacts

Under this option, all vessels having a Category A, B, C, or D permit would be prohibited from fishing for, possessing, catching, transferring, or landing herring from the proposed River Herring Protection Areas on all fishing trips using small mesh. The economic impact of this alternative on fishing vessels is the change in profits of these vessels, after accounting for any behavioral changes. Under a spatial closure, the directed herring fleet may undertake different averting behavior to minimize the impact of those spatial closures. Vessels may fish in other areas, likely with lower profits. Vessels may fish in other fisheries, again, likely earning lower profits, or cease fishing operations, in which case they earn zero operating profits.

Maps of fishing effort in the herring fishery are presented in Figure 7 – Figure 27. The fishing time, herring catch, herring revenues, and total revenues which would occur in the River Herring Protection areas are presented in Table 35 – Table 42. It is important to note that the revenue figures presented in Table 39 – Table 42 **do not** represent the economic impacts of the proposed River Herring Protection Areas. These tables should be interpreted as the effort, landings, and revenue which would be at-risk or exposed to change from the protection areas.

There is minimal overlap between the purse seine fishery and the river herring protection areas during September-December. There is also minimal overlap between the Category D permit holders and the river herring protection areas. There is substantial overlap between the trawl fishery and the proposed river herring protection areas, particularly in January-February and November-December, with lesser overlap in other months. Over 50% of the Category A/B/C trips fished for some time within the proposed protection areas.

The effort, catch and revenue tables confirm that the River Herring Protection Areas would have minimal impact on the purse seine fleet and could have substantial impacts on the trawl fleet. In 2010, the trawl fishery spent approximately one-third of its fishing time within the proposed River Herring Protection Areas, catching one-third of the annual herring catch, 29% of its total herring revenues, and 33% of total revenues within those areas.

The impacts of the River Herring Protection Areas are likely to be largest for the trawl fishery during the winter (January-February and November-December). According to those figures, a large portion of total effort during those months occurs inside the proposed River Herring Protection Areas. Captains have built up large amounts of human capital (knowledge and experience) regarding where and how to catch fish. Closing the most productive areas to fishing will lead to higher costs (searching and steaming), lower catch-per-unit-effort, as vessels fish in unfamiliar areas and on lower densities of fish, and lower profits. For these months, captains are not likely to be familiar with alternative fishing locations. If they choose to fish for herring in alternative locations, captains will build their knowledge and experience; however, this process may take time.

This river herring protection option may have impacts on shoreside processors, bait dealers, and other consumptive users of herring. This option may reduce supply of herring, particularly in the winter months in the Southern New England areas.

Table 35 Fishing Time (Hours) Inside and Outside the River Herring Protection Areas

		Fishing Time		
Gear	Category	Not Protected	Protected	Grand Total
PUR		2,940	7	2,947
TR	ABC	8,029	4,077	12,105
	D	227	71	298
Grand Total		11,197	4,155	15,351

Table 36 Fishing Time (%) Inside and Outside the River Herring Protection Areas

		Fishing Time (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.3%	33.7%	100.0%
	D	76.3%	23.7%	100.0%
Grand Total		72.9%	27.1%	100.0%

Table 37 Herring Catch (lbs.) Inside and Outside the River Herring Protection Areas

		Herring Catch		
Gear	Category	Not Protected	Protected	Grand Total
PUR		18,423,800	38,741	18,462,541
TR	ABC	82,973,751	41,130,098	124,103,849
	D	112,799	36,045	148,844
Grand Total		101,510,350	41,204,884	142,715,233

Table 38 Herring Catch (%) Inside and Outside the River Herring Protection Areas

		Herring Catch (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.9%	33.1%	100.0%
	D	75.8%	24.2%	100.0%
Grand Total		71.1%	28.9%	100.0%

Table 39 Herring Revenue ($) Inside and Outside the River Herring Protection Areas

		Herring Revenue		
Gear	Category	Not Protected	Protected	Grand Total
PUR		$2,952,318	$5,760	$2,958,078
TR	ABC	$11,059,051	$4,561,645	$15,620,696
	D	$18,792	$5,645	$24,437
Grand Total		$14,030,161	$4,573,050	$18,603,211

Table 40 Herring Revenue (%) Inside and Outside the River Herring Protection Areas

		Herring Revenue (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	70.8%	29.2%	100.0%
	D	76.9%	23.1%	100.0%
Grand Total		75.4%	24.6%	100.0%

Table 41 Total Revenue ($) Inside and Outside the River Herring Protection Areas

		Total Revenue		
Gear	Category	Not Protected	Protected	Grand Total
PUR		$2,952,369	$5,760	$2,958,129
TR	ABC	$12,065,312	$6,027,755	$18,093,067
	D	$33,329	$9,683	$43,011
Grand Total		$15,051,010	$6,043,198	$21,094,208

Table 42 Total Revenue (%) Inside and Outside the River Herring Protection Areas

		Total Revenue (%)		
Gear	Category	Not Protected	Protected	Grand Total
PUR		99.8%	0.2%	100.0%
TR	ABC	66.7%	33.3%	100.0%
	D	77.5%	22.5%	100.0%
Grand Total		71.4%	28.6%	100.0%

Category A/B Versus Category C and Category D Vessels

To further investigate differential impacts by herring permit category, herring catch and revenues from these vessels inside and outside the proposed protection areas are summarized by permit category in Table 43. While 22-24% of the Category D effort, catch, and revenues are derived from the monitoring areas, the magnitude of effort, catch, and revenues attributable to Category D vessels is minimal. A fairly large portion of the Category A/B/C trawl fishery would be impacted by the monitoring options; 40-45% of the effort, catch, and revenues for this segment of the fishery occurred in the monitoring areas. Category C vessels often participate in other fisheries and catch herring incidentally. Table 43 shows that Category C vessels derive almost 30% of their revenues from the areas proposed for closure under this alternative.

Table 43 Herring Catch/Revenues and Total Revenues Inside and Outside the Proposed Protection Areas by Limited Access Herring Permit Category

Permit Cat.	No. Vessels	Inside/ Outside	Hours Fished	Herring Revenues (millions dollars)	Herring Catch (millions pounds)	Total Revenue (millions dollars)
A	27	Outside	8,988	$11.84	83.79	$12.66
A	26	Inside	5,140	$6.28	55.75	$7.91
B	1	Outside	Cannot report	Cannot report	Cannot report	Cannot report
B	3	Inside	357	$0.17	1.58	$0.17
C	3	Outside	320	$0.21	0.84	$0.22
C	6	Inside	239	$0.07	0.56	$0.09
D	6	Outside	227	$0.02	0.11	$0.03
D	5	Inside	71	$0.01	0.04	$0.01

7.0 HERRING PDT ANALYSIS – TRADE-OFFS OF SPATIAL MANAGEMENT MEASURES

The following tables summarize the biological, economic, and social trade-offs of the spatial management measures under consideration in Amendment 5 to address river herring bycatch (Table 44 – Table 48).

Table 44 Biological – River Herring-Focused Trade-offs of Spatial Management Approaches

	Biological- River Herring	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	No additional positive impacts.	No additional negative impacts.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Areas improve understanding of river herring encounters in the Atlantic herring fishery through focused monitoring. Possible reductions in river herring mortality.	No impact on river herring mortality, unless the fishery chooses to stay out of monitoring areas. Specific areas monitored instead of across the full range of the species misses important river herring encounters and influences river herring removals estimates.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Areas with relatively high river herring encounters are avoided (by time or distance) when river herring are encountered at some threshold level. Likely reductions in river herring mortality.	No river herring mortality protection outside of avoidance areas. Areas outside avoidance areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year variability.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots. Likely reductions in river herring mortality.	No river herring mortality protection outside of protection areas. Areas outside fixed areas could have increased rates of river herring encounters by the fishery, if areas selected do not reflect year-to-year variability.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Areas provide river herring mortality protection during at-sea migrations by closing specific river herring encounter hotspots upon reaching a trigger. Possible reductions in river herring mortality.	No river herring mortality protection outside of trigger areas. Trigger areas are not put in place quickly enough to be at the pace with river herring migratory patterns.

Table 45 Biological – Other Small Pelagics-Focused Trade-offs of Spatial Management Approaches

	Other Small Pelagic– American and Hickory Shad, Mackerel, Herring, Squid, Butterfish, Whiting, Menhaden	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	No additional positive impacts.	No additional negative impacts.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Increased monitoring can provide additional information on bycatch/discards of other non-target species	Dependent on individual species life history and migratory patterns.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Areas with co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are avoided (by time or distance) when river herring are encountered at some threshold level. Possible reductions in American and hickory shad mortality, high rate of co-occurrence with river herring in NEFOP data for Atlantic herring fishery.	Dependent on individual species life history and migratory patterns.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	Areas might provide mortality protection for co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are protected by closing specific river herring encounter hotspots. Likely reductions in American and hickory shad mortality, due to high rate of co-occurrence with river herring encounters in NEFOP data for Atlantic herring fishery.	Dependent on individual species life history and migratory patterns.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Areas might provide mortality protection for co-occurring small pelagic species (shads, mackerel, herring, squid, butterfish, whiting) and potentially groundfish are protected by closing specific river herring encounter hotspots upon reaching a trigger. Possible reductions in American and hickory shad mortality, due to high rate of co-occurrence with river herring encounters in NEFOP data for AH fishery.	Dependent on individual species life history and migratory patterns.

Table 46 Economic – Atlantic Herring Fishery Participants Focused Trade-offs of Spatial Management Approaches

	Economic- Atlantic herring fishery participants	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	No additional positive impacts.	No additional negative impacts.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	There are no economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	The SBRM-prioritized monitoring of fishing fleets can be considered the optimal pattern of observer coverage. To the extent that Fixed Bimonthly Monitoring Areas results in diversion of scarce observer days away from this optimal pattern of observer coverage, there is an economic loss. This is a loss of information which will result in less data available about bycatch in other fisheries and, presumably, stock assessments with larger errors. If the Fixed Bimonthly Monitoring Areas do not shift observer days away from the optimal pattern, then there is no information loss. If additional observer coverage is paid for by industry, this represents a negative economic impact. This can be calculated by estimating the additional observer coverage days and multiplying by the cost of an observer day. The Closed Area I Sampling Provisions would entail slightly higher regulatory and compliance costs than the other options being considered.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)		
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	There are no direct economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	Decreases in revenue in the directed Atlantic Herring Fishery and/or increases in costs of fishing for participants in the directed Atlantic Herring Fishery. The largest impacts are likely to be felt by trawl fishery participants during the winter season due to the high overlap between the Protection Areas and the current spatio-temporal distribution of fishing effort.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	There are no direct economic benefits to the directed Atlantic herring fishery, relative to the status quo (no action alternative).	Decreases in revenue in the directed Atlantic Herring Fishery and/or increases in costs of fishing for participants in the directed Atlantic Herring Fishery. The largest impacts are likely to be felt by trawl fishery participants during the winter season due to the high overlap between the Protection Areas and the current spatio-temporal distribution of fishing effort. These costs are likely to be lower than Alt 3, Opt 1; however, there is substantial uncertainty associated with projecting when the Triggers might be reached.

Table 47 Social – Focused Trade-offs of Spatial Management Approaches

	Social/Other- management, directed-river herring fishery, etc.	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	No additional positive impacts.	No additional negative impacts.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Participants in the directed river herring fishery should see increased availability of river herring catch, if the fixed monitoring areas results in higher stock levels of river herring. Indirect users of the river herring resource, including consumers that use species that prey on river herring, will benefit if the monitoring areas result in higher stock levels of river herring. Would enable Atlantic herring fishery participants to avoid river herring mortality if encounters are communicated quickly and consistently.	Increased economic costs associated with industry payment for observers could trigger additional losses of vessels and processing plants, thereby also affecting bait supplies for other fisheries.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Would enable Atlantic herring fishery participants to avoid river herring mortality if encounters are communicated quickly and consistently. This would also demonstrate the fishery's responsiveness to concerns about river herring.	Increased economic costs with industry payment for observers could trigger additional losses of vessels and processing plants, thereby also affecting bait supplies for other fisheries. Keeping the threshold values meaningful could be problematic as the size of the river herring stock changes.
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)	Most straight-forward option to enforce	Since the hotspots are variable, this might unnecessarily constrain Atlantic herring operations, leading to increased social costs triggered by economic losses.
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Triggers are understood so Atlantic herring fishery participants would be likely to limit fishing in the protection area if feasible, but if river herring is not encountered, fishing could continue if the Atlantic herring are present.	Uncertainty associated with trigger mechanisms makes planning more difficult. Keeping the trigger values meaningful could be problematic as the size of the river herring stock changes.

Table 48 Monitoring – Focused Trade-offs of Spatial Management Approaches

	Monitoring- NEFOP	
Possible Measure	**Positive Impacts**	**Negative Impacts**
No Action (A1)	Benefits associated under the no action alternative possible if catch monitoring provisions that would apply across the fishery, (i.e. the 100% observer coverage option) which would allow for observers to document interactions with river herring across the fleet, at different times and in different areas that perhaps have not been sampled before. More coverage allows for more biological sampling, more scale sampling and length frequency collection which will aid in the stock assessment process and will add to further understanding of the species and stock. Catch Monitoring Alternatives 3 and 4 would also increase coverage rates, if selected, and therefore provide the same type of biological benefits associated with increased sampling, and generally increasing the possibility of encountering the species. Increased monitoring will lead to greater understanding of interactions with river herring and the overall fleet during peak fishing times and off peak fishing times of the year.	Increased monitoring beyond federal funds would cost the industry and would have a negative impact with the potential for backlash to observers if/when industry has to pay for them. Or it could be the opposite – perhaps industry will buy into the increase in scientific information to improve stock assessments for the future of their fishery, and therefore work more closely with observers. Cost could be different if an industry funded at-sea monitoring program were developed vs. a full observer program currently in place.
Fixed Bimonthly Monitoring Areas (Alt.2, Opt.1-3)	Increased sampling would be achieved, therefore further quantifying the catch composition. Biological sampling would be increased, potentially if increased interactions occur. Further understanding of the interactions and where and when they take place. Ground-truthing the monitoring areas if catches show river herring composition. May in fact avoid fishing in areas with the coverage requirements, if they are paying for the coverage, which would decrease potential negative impacts on the species.	Possibly difficult determining ahead of time what areas the fleet will fish in, and therefore how they will notify for an area. Are they allowed to fish in multiple monitoring areas on a single trip, if not it would impact their flexibility and therefore possible catch, if there are low catch rates in an area. Can they fish inside and outside of a monitoring area, and if so do they need to have the coverage for that particular situation? How to enforce the notifications (i.e. what if they notify for one area and fish in another?) This could affect the coverage rates if coverage is less than 100%. Increased monitoring beyond federal funds would cost the industry and would have a negative impact. Again, an ASM program may be a cost-effective option. Monitoring areas are set in place until a framework action is taken, which could take some time, if river herring are not present in the areas, as would be documented by the observer data, and the industry is paying for it likely they will want to update the area determination quickly.
Fixed Bimonthly Avoidance Areas (Alt.2, Opt.4)	Same as above	Same as above
Fixed Bimonthly Protection Areas (Alt. 3, Opt.1)		
Triggered Bimonthly Protection Areas (Alt.3, Opt.2)	Similar to Monitoring/Avoidance	Similar to Monitoring/Avoidance Except similar to the haddock cap, if the industry is paying attention to the trigger number, and they are close to hitting

	Monitoring- NEFOP	
Possible Measure	**Positive Impacts**	**Negative Impacts**
		the trigger, which could prove difficult for observers. Pressure is higher on such trips. Potential of releasing catch (slippage) may be higher. Or if the industry knows if they hit the trigger then they have to pay for 100% coverage to fish in an area, again may lead to potential slippage events.

8.0 OPTIONS FOR SHRIMP/LARGE MESH FISHERY EXEMPTIONS TO RIVER HERRING MANAGEMENT MEASURES

At the September 2011 NEFMC Meeting, the Council agreed to consider exemptions to the options in River Herring Alternatives 2 and 3 that would require 100% observer coverage, Closed Area I provisions, or closed areas (Alternative 3). These exemptions are being considered for the Northern Shrimp Fishery, which operates seasonally in the inshore Gulf of Maine, and for the large mesh groundfish fishery (using mesh greater than 5.5 inches). The following information is included in this document to provide some perspective on river herring and other bycatch occurring in these two fisheries so that the Council can make a more informed decision when it selects the final measures for Amendment 5 and considers any exemptions.

8.1 BACKGROUND INFORMATION – NORTHERN SHRIMP FISHERY

8.1.1 Overview

Management Plan and Status of the Stock

The Northern Shrimp Fishery is managed through the Interstate Fisheries Management Program (ISFMP) of the Atlantic States Marine Fisheries Commission (ASMFC). The Fishery Management Plan for Northern Shrimp was first approved under the ISFMP in October 1986. Amendment 1, implemented in 2004, established biological reference points for the first time in the shrimp fishery and expanded the tools available to manage the fishery. Management of northern shrimp under Amendment 1 resulted in a rebuilt stock and increased fishing opportunities. However, early season closures in the fishery occurred in the 2009/2010 and 2010/2011 fishing seasons because landing rates were far greater than anticipated. Furthermore, untimely reporting resulted in short notice of the season closures and an overharvest of the recommended total allowable catch (TAC) by 28% in 2010 and 48% in 2011. In response to these issues, Amendment 2, approved by the ASMFC Northern Shrimp Section in October 2011, provides management options to slow catch rates throughout the season, including trip limits, trap limits, and days out of the fishery.

Amendment 2 completely replaces the FMP, and modifies the fishing mortality reference points to include a threshold level, includes a more timely and comprehensive reporting system, and allows for the initiation of a limited entry program to be pursued through the adaptive management addendum process. At its fall 2010 meeting, the Section approved a 136-day season: December 1, 2010, through April 15, 2011, inclusive. The Section took emergency action to close the northern shrimp fishery on February 28, 2011 based on preliminary landings data that indicated that harvest was already at 4,192 metric tons, 192 metric tons in excess of the recommended landings level.

Regulations pertaining to the northern shrimp fishery in Federal waters can be found in 50 CFR Section 648.80(a)(5). Shrimp vessels may fish in the Gulf of Maine during the season established by ASMFC and using a properly configured finfish excluder device called the Nordmore grate (see more information below). In addition to shrimp, vessels are allowed to retain silver/offshore hake up to 3,500 pounds, American lobster up to 10% by weight of all other species on board, or 200 lobsters, whichever is less, and longhorn sculpin. Shrimp vessels are not allowed to retain any herring or river herring, so any incidental catch of these species must be discarded.

The current fishing mortality reference points as established by Amendment 2 and re-estimated by the NSTC in 2011 are *Ftarget* =0.32, *Fthreshold*= 0.41, and *Flimit*= 0.60. The terminal year estimate of fishing mortality from the base run of the stock assessment is *F2011*= 0.68, indicating that fishing mortality has exceeded the threshold, resulting in overfishing. The current biomass reference points as

established by Amendment 2 are *Bthreshold* = 9,000 mt and *Blimit* = 6,000 mt. The terminal year estimate of biomass is 6,500 mt, indicating that the biomass is below the threshold, resulting in an overfished condition. Amendment 2 states that if fishing mortality exceeds the limit level, and biomass is less than the threshold level, the Section must act immediately to reduce fishing mortality.

Shrimp Fishery Performance

In 2009, 2,500 mt were landed during a season that was market-limited. The proposed 180-day season for 2010 was cut short to 156 days due to the industry exceeding the committee's recommended landings cap for that year, and concerns about small shrimp. The preliminary landings for 2010 are 6,256 mt, which is more than double the landings observed in 2009, and well above the recommended limit of 4,900 mt.

As in 2010, the 2011 season was closed early. The season was scheduled to be 136 days, considerably shorter than the proposed 180-day season of 2010. On February 28, after emergency action by the Section, the 2011 season was closed due to harvest above the recommended limit, completing a 90-day season. A preliminary total of 5,940 mt of shrimp were landed, exceeding the recommended limit (4,000 mt) by approximately 2,000 mt. The average price per pound was $0.75 and the preliminary estimated landed value of the catch was $9.8 million.

The number of vessels participating in the fishery in recent years has varied from a high of 347 in 1996 to a low of 144 in 2006. In 2011, there were 276 vessels from Maine, 12 from Massachusetts, and 20 from New Hampshire, for a total of 308, according to federal VTR and Maine harvester logbook data (preliminary). Of the 276 vessels from Maine, 125 were trapping. The number of vessels participating in the fishery in recent years has varied from a high of 347 in 1996 to a low of 144 in 2006. In 2011, there were 276 vessels from Maine, 12 from Massachusetts, and 20 from New Hampshire, for a total of 308, according to federal VTR and Maine harvester logbook data (Table 49). Of the 276 vessels from Maine, 125 were trapping.

In 2009, the length of the shrimp fishery season was increased to 180 days while the effort decreased to 2,096 trips, likely caused by limited demand from the processors and poor market conditions. In what turned out to be a 156-day season in 2010, effort increased dramatically to 4,081 trips (preliminary data). The market conditions were improved from prior years due to Canada's limited supply and an increase in local markets. In 2011, the truncated 90-day season yielded and effort similar to 2010 with 4,711 trips. The high level of effort was again due in part to a limited supply in Canada and demand from local markets.

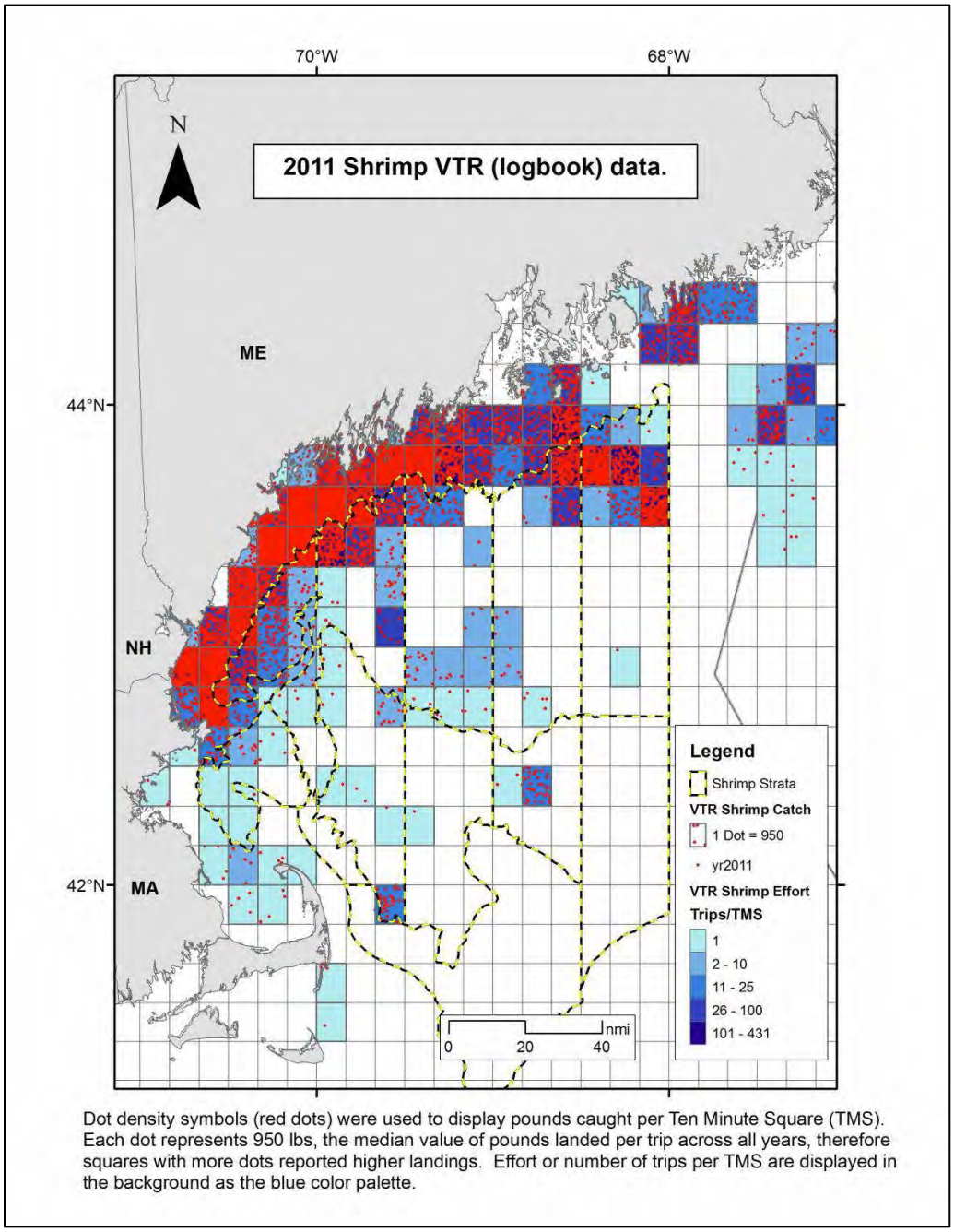
Table 49 U.S. Commercial Landings (mt) of Northern Shrimp in the Gulf of Maine

	No. Vessels	Trawl Trips	Landings (mt)
2009 **Dec. 1 – May 29**	170	2,096	2,501.2
2010 **Dec. 1 – May 5**	254	4,081	6,256.1
2011 **Dec. 1 – Feb. 28**	308	4,711	5,943.9

Seasonal trends in distribution of trawl effort can be evaluated from port interview data. The relative magnitude of offshore fishing effort (deeper than 55 fathoms) has varied, reflecting seasonal movements of mature females (inshore in early winter and offshore following larval hatching), but also reflecting harvesters' choices for fishing on concentrations of shrimp. Of the 176 interviews of Maine trawl

fishermen in 2011, 87% fished inshore and 13% fished offshore. The highest proportion of inshore trips from 153 interviews occurred in January (51%), followed by February (45%), and in December comprised 4% of the trips. Of the offshore trips, 74% were in December, decreasing to about 17% in January and 9% in February based on a total of 23 harvesters reporting offshore trips during port interviewsLocations of 2011 fishing trips and landings from federal and state VTRs are plotted by 10-minute square in Figure 59.

Figure 59 Pounds Caught and Numbers of Trips During the 2011 Northern Shrimp Fishing Season by 10-minute-square



Dot density symbols (red dots) were used to display pounds caught per Ten Minute Square (TMS). Each dot represents 950 lbs, the median value of pounds landed per trip across all years, therefore squares with more dots reported higher landings. Effort or number of trips per TMS are displayed in the background as the blue color palette.

Utilization of the Nordmore Grate

The finfish-excluder device (FED), the Nordmore grate, has been mandatory in the Gulf of Maine Northern shrimp (*Pandalus borealis*) fishery since April 1992. Prior to its use, juvenile groundfish bycatch in the shrimp fishery was of primary concern (Howell and Langan 1992). Groundfish bycatch has been substantially reduced through the use of the Nordmore grate (Richards and Hendrickson 2006), and a new gear innovation, the "topless" trawl, also greatly reduces pelagic fish bycatch (He et al. 2007).

Richards and Hendrickson (2006) examined bycatch before and after use of the Nordmore grate in the shrimp fishery, using observer data from NEFOP and MA DMF. Primarily, they examined individual groundfish and flatfish species bycatch, but they did also summarize pelagic species bycatch as a group. In their analysis, pelagic species included alewife (*Alosa pseudoharengus*), butterfish (*Peprilus triacanthus*), blueback herring (*Alosa aestivalus*), Atlantic herring (*Clupea harengus*), unidentified herring (Clupeidae), Atlantic mackerel (*Scomber scombrus*), Atlantic menhaden (*Brevoortia tyrannus*), American shad (*Alosa sapidissima*), and hickory shad (*Alosa mediocris*). Prior to the use of the Nordmore grate, primary bycatch species included groundfish and flatfish, and secondarily pelagic fish (see Table 3). With the grate in place, groundfish and flatfish bycatch was greatly reduced, while pelagic fish bycatch shifted up in importance based on percentage bycatch composition.

For these reasons, additional gear modifications have been investigated to reduce pelagic species bycatch. Previous experiments demonstrate that the "topless trawl" used with the Nordmore grate further reduces finfish bycatch especially for pelagic species in the shrimp fishery (He et al. 2007). Bycatch of Atlantic herring was reduced by 86.6% with some increase in the catch of shrimp and flatfish bycatch. Modest reductions in blueback herring were also evident from the experiments.

GMRI monitored and documented bycatch of regulated groundfish and non-regulated species for the 2008-2009 Northern shrimp fishing season, augmenting NEFOP data collection during the same time (Eayrs et al. 2009). Eayrs et al. (2009) found that shrimp catch was 96% (GMRI data) and 92% (NOAA data) of total catch weight, of this less than 2% of total catch weight was regulated bycatch, rarely exceeding 5% of total catch weight in a single haul (roughly 55 lbs of regulated bycatch per haul in GMRI data). Eayrs et al. (2009) also looked at the effect of Nordmore grate orientation and noted orientation did not appear to impact performance, but noted limitations of the preliminary study. Eayrs et al. (2009) indicated data collection included river herring and Atlantic herring length measurements. Analysis, however, focuses on groundfish species, and therefore results for herring species are not directly provided.

Recent preliminary work suggests that spatial and temporal characteristics in bycatch in the Northern shrimp fishery may inform bycatch reduction strategies (Rillahan and He 2011). Rillahan and He (2011) analyzed 300 research tows using standard shrimp trawl nets by shrimp fishing vessels in New Hampshire and Maine between the months of February and June from 2004 to 2010. They noted that bycatch levels varied from 0.7 to 86.7% of total catch within a tow, with overall bycatch less than 20% of total catch observed. They identified 26 bycatch species, of which silver hake (*Merluccius bilinearis*) was the primary bycatch species. Silver hake bycatch predominately occurred in late spring with May landings the highest (average at 89.5% of all bycatch by weight). They noted that other pelagic bycatch species included Atlantic and blueback herring as primary bycatch species in February and March. Flatfish species including American Plaice (*Hippoglossoides platessoides*) and witch flounder (*Glyptocephalus cynoglossus*) were also important bycatch species in April, May and June. Preliminary length-frequency analysis of silver hake, American plaice and Atlantic herring suggests that the majority of species ranged from 10-25 cm total length. Forthcoming analysis will examine patterns in more detail to improve bycatch mitigation strategies.

8.1.2 River Herring Bycatch in the Northern Shrimp Fishery

To consider an exemption to the river herring measures proposed in Amendment 5, river herring bycatch in the small mesh Northern shrimp fishery in the Gulf of Maine was investigated. Observer data for 2005-2010 was queried from the database. Results are presented in Table 50 and Table 51 (below). The data summarized in these tables represents all observer data on trips using the Nordmore grate in the Gulf of Maine between 2005-2010, regardless of target species (a Nordmore grate is required in the Northern shrimp fishery) and regardless of whether or not the vessels possess a herring permit.

In total, from 2005-2010, 97 shrimp trips were observed, representing less than 1% of the fishery when the State-only vessels are included (Table 50). Small amounts of river herring were observed in the catch (Table 51), but the low level of observer coverage precludes expansion of the bycatch numbers to develop an estimate of bycatch across the fishery; low sampling would lead to an extremely high CV and is not appropriate in this case.

State-permitted vessels represent the majority of the fishery. These vessels do not have herring permits. In 2010, VTR records indicate that 705 trips were taken by federally permitted vessels in the shrimp fishery (Table 52), while the total number of trips including the state vessels was 1,954.

Table 50 Number of Observed Trips and Percent Coverage in the Gulf of Maine Northern Shrimp Fishery, 2005-2010

Year	No. Trips Observed	Total No. Trips	Percent Coverage
2005	17	2,261	0.75
2006	20	2,838	0.70
2007	14	1,566	0.89
2008	19	2,635	0.72
2009	12	3,510	0.34
2010	15	1,954	0.77
Total	**97**	**14,764**	

Table 51 Total Catch Observed in the Northern Shrimp Fishery (Retained and Discarded) in Pounds by Species (2005-2010)

Species	Pounds caught
HAKE, SILVER (WHITING)	7,811
HERRING, ATLANTIC	2,488
FLOUNDER, AMERICAN PLAICE	1,846
LOBSTER, AMERICAN	796
REDFISH, NK (OCEAN PERCH)	738
SCULPIN, LONGHORN	697
FLOUNDER, WINTER (BLACKBACK)	621
HAKE, WHITE	557
HERRING, NK	447
ALEWIFE	443
HAKE, RED (LING)	412
HERRING, BLUEBACK	392
FLOUNDER, WITCH (GREY SOLE)	327
POLLOCK	185
FLOUNDER, SAND DAB (WINDOWPANE)	182
DOGFISH, SPINY	123
SKATE, LITTLE	95
FLOUNDER, YELLOWTAIL	88
COD, ATLANTIC	86
MONKFISH (GOOSEFISH)	84
MACKEREL, ATLANTIC	73
BUTTERFISH	72
HAKE, RED/WHITE MIX	56
MENHADEN, ATLANTIC	50
HADDOCK	46
FLOUNDER, FOURSPOT	39
SKATE, WINTER (BIG)	38
SKATE, NK	36
STARFISH, SEASTAR,NK	33
SEAWEED, NK	30
SCALLOP, SEA	24
FISH, NK	21
WRYMOUTH	21
CUSK	20
SMELT, RAINBOW	20
RAVEN, SEA	17
ROCKLING, FOURBEARD	15
HALIBUT, GREENLAND	14
SQUID, SHORT-FIN	10
HAKE, SPOTTED	10

Table 52 shows the number of shrimp trips during 2010 that were taken by federally permitted herring vessels and other federally permitted vessels that do not possess a herring permit. Of the herring-permitted vessels, Category C vessels are most active in the northern shrimp fishery; these vessels took 495 trips in 2010. Of all 705 trips that occurred by federally permitted vessels in 2010 (601 trips by herring vessels), only seven (7) were taken when declared into the herring fishery (and therefore subject to the herring FMP requirements). It appears that the vast majority of shrimp vessels declare out of the herring fishery to avoid the additional herring requirements (pre-landing notification), as there is no allowance for herring landings in the shrimp fishery anyway.

Table 52 Number of Shrimp Trips in 2010 by Herring and Non-Herring Permit Categories

Permit Category	Trip Count
Herring A	35
Herring B	71
Herring C	495
Non-herring	104
Total	**705**

**Does not include trips taken by State-only vessels.*

8.2 BACKGROUND INFORMATION – LARGE-MESH GROUNDFISH FISHERY

Because of haddock interactions (offshore) and measures under consideration to address midwater trawl access to groundfish closed areas, the Northeast multispecies (groundfish) fishery is identified as one of the "Other Fisheries" included for the analyses of the measures proposed in Amendment 5. A more complete description of the groundfish fishery can be found in Volume I.

Observer data suggest that large-mesh bottom trawls are catching river herring, alewife, and shad in amounts that appear to be insignificant. Table 53 summarizes observer data for 113 trips taken on 21 bottom trawl vessels with a Category A or B permit using large mesh. Table 54 summarizes observer data for 194 trips on 41 bottom trawl vessels with a Category C permit using large mesh. And Table 55 summarizes observer data for 1,832 trips on 471 bottom trawl vessels with a Category D permit using large mesh. Observed bycatch of river herring/shad appears to be slightly higher during the second half of the fishing year, but still very low. The percent coverage levels for the groups of vessels represented in these tables was not determined.

Table 53 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category A and B, Large Mesh (>5.5 inch)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	158		**158**	39		**39**
FISH, NK	787		**787**	340		**340**
HERRING, ATLANTIC	284		**284**	182		**182**
HERRING, BLUEBACK	1		**1**	17		**17**
HERRING, NK	2		**2**	13		**13**
SHAD, AMERICAN	164	6	**170**	74		**74**

Table 54 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category C, Large Mesh (>5.5)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	27		**27**	7		**7**
FISH, NK	235		**235**	46		**46**
HERRING, ATLANTIC	139	4	**143**	715	200	**915**
HERRING, BLUEBACK	6		**6**	53		**53**
HERRING, NK						
SHAD, AMERICAN	13		**13**	42		**42**

Table 55 Catch and Discards of All Species on Observed Trips, 2009-2010, Bottom Otter Trawl, Permit Category D, Large Mesh (>5.5 inch)

Species	January - June			July-December		
	Lbs Disc	Lbs Kept	Total Lbs	Lbs Disc	Lbs Kept	Total Lbs
ALEWIFE	698		**698**	1,272	6	**1,278**
FISH, NK	12,812	310	**13,122**	2,845	6	**2,851**
HERRING, ATLANTIC	1,188	97	**1,285**	4,983	41	**5,024**
HERRING, BLUEBACK	351	3	**354**	542	70	**612**
HERRING, NK	212		**212**	79		**79**
SHAD, AMERICAN	1,249	18	**1,267**	538	2	**540**

8.3 POTENTIAL IMPACTS OF PROPOSED EXEMPTIONS

It is difficult to predict the impact on river herring catch that is likely to result from exempting the shrimp and/or large mesh groundfish fishery from the Amendment 5 river herring measures. Certainly, the more restrictive the management measures in this amendment and the fewer exemptions, the more likely the measures are to benefit the river herring resource. However, river herring catch in the northern shrimp and large-mesh groundfish fisheries appears to be relatively small.

The proposed exemptions would have positive impacts on some fishing operations by providing opportunities to participate in other fisheries that may overlap the river herring monitoring or protection areas. If the vessels in the shrimp fishery and large mesh groundfish fishery are exempted, they may continue their fishing operations in areas that would otherwise require 100% observer coverage, increased sampling, possible closure, among other measures. Vessels in these two fisheries that also have a herring permit would be able to declare out of the herring fishery and prosecute shrimp or groundfish in the areas that those fisheries operate. This increases opportunities and may mitigate some of the negative impacts of the proposed river herring measures.

Category A vessels took 35 shrimp trips in 2010, Category B vessels took 71 shrimp trips, and Category C vessels took 495 shrimp trips in 2010. Category C vessels are the most dependent of the herring vessels on the shrimp fishery; these vessels are likely smaller (less than 80 feet) and hail from ME, NH, and MA. The proposed exemption for the shrimp fishery would especially benefit these vessels because of their higher level of participation in the shrimp fishery and lower level of participation in the herring fishery; some of the measures proposed in this amendment are likely to produce a significant cost on the industry, and Category C vessels land less than 3% of herring during the fishing year.

9.0 IMPACTS OF ALTERNATIVES TO ADDRESS RIVER HERRING BYCATCH ON VECS

The impacts of each of the management alternatives under consideration to address river herring bycatch on the VECs identified in the Amendment 5 are discussed in Volume I of the Amendment 5 Draft EIS document.

Appendix VII

Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery

Prepared for the Atlantic Herring PDT

by

Jamie M. Cournane, Ph.D.
University of New Hampshire and Environmental Defense Fund

and

Matt Cieri, Ph.D.
Maine Department of Marine Resources

and

Steven J. Correia
Massachusetts Division of Marine Fisheries

December 2010

Background

At its September 2010 meeting, the New England Fishery Management Council (NEFMC) passed a motion for the Herring Oversight Committee (OC) to develop catch cap options for river herring (alewife, *Alosa pseudoharengus*, and blueback herring, Alosa *aestivalis*) in Amendment 5 (A5) to the Atlantic Herring Fishery Management Plan (FMP). Since that meeting, the Plan Development Team (PDT) has analyzed river herring removals for the OC to consider when developing river herring catch cap options for the directed Atlantic herring, *Clupea harengus*, fishery. The following is a summary of analysis developed by the PDT.

Previous Estimations of River Herring Removals

Two recent studies estimated river herring removals by New England and Mid-Atlantic fisheries. Table 1 summarizes the general findings from these studies. Cieri et al. (2008) found that river herring bycatch (kept and discarded) in the directed herring fishery was highest in late fall and winter. Overall, the highest bycatch was for single and paired mid-water trawl gears. They noted that Atlantic herring, Atlantic mackerel (*Scomber scombrus*), and river herring mix as they migrate around Cape Cod to their overwintering grounds south of Block Island. Wigley et al. (2009) concluded that river herring discards were greatest in the New England small mesh otter trawl fleet and to a lesser extent in New England shrimp trawl, New England large mesh trawl and Mid-Atlantic small mesh otter trawl fleets. They noted that the number of observed gillnet trips was low and difficulty estimating discards in high volume fisheries likely impacted the results.

Year	Fishery	Estimation	Removals of River Herring (lbs)	Coefficient of Variation	Authors
2005	Directed Atlantic Herring	Kept + Discards	285,833	60%	Cieri et al. 2008
2006	Directed Atlantic Herring	Kept + Discards	171,973	60%	Cieri et al. 2008
2007	Directed Atlantic Herring	Kept + Discards	1,686,617	50%	Cieri et al. 2008
June 2008-July 2009	All fisheries with river herring discards	Discards	106,455	149%	Wigley et al. 2009

Table 1: Comparison of recent studies to estimate river herring removals at sea.

Catch Cap Relative to Catch History

In the absence of an assessment for river herring, one alternative is to set a catch cap relative to recent river herring catches in the directed Atlantic herring fishery. The first step in this process is to obtain the best possible estimate of river herring removals, both kept and discarded, by the directed Atlantic herring fishery. Here, directed Atlantic herring trips were defined as those which kept or landed in excess of 2,000 lbs of Atlantic herring.

Methods

Data Selection. Northeast Fishery Observer Program (NEFOP) data and Vessel Trip Reports (VTRs) from 2005-2009 directed Atlantic Herring trips were selected for this analysis, similar to the data selected for the river herring hotspot analysis. Although other data sources were considered (e.g., dealer data, portside sampling), these alternatives were subject to shortcomings that would likely lead to biased and imprecise estimates of river herring bycatch, which made them less favorable to the use of NEFOP and VTR data. Alewife and blueback herring are combined in the analysis because species identification is difficult and the portside project did not distinguish between species until 2006. Furthermore, 2009 data was robust when compared with other sampling years because of improvements in the pelagic fisheries observing programs and higher coverage rates by gear type.

Stratification. For this analysis, trip data from the NEFOP and VTRs were grouped into year, half-year (Jan-June and July-Dec), area, and gear type. Three broad gear categories were used that included bottom trawls, mid-water trawls (single and paired), and purse seines. Areas were defined as Gulf of Maine (GOM), Cape Cod (CC), and Southern New England (SNE). These areas represent the major locations where the directed Atlantic herring fishery occurs and loosely follow the Fishery Management Plan area boundaries for Atlantic herring (Figure 1). Groupings with less than three observer trips were omitted from the analysis (Table 2).

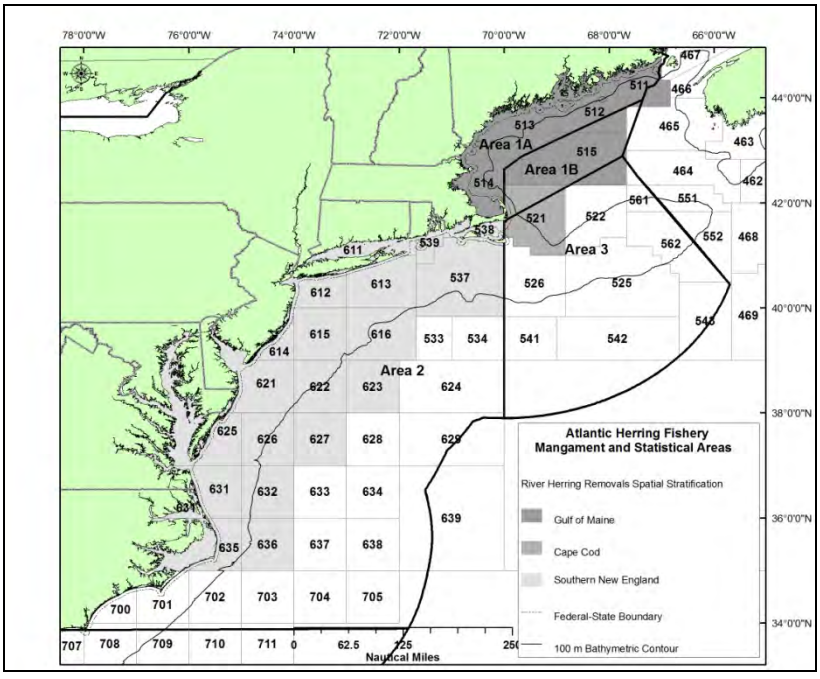


Figure 1: Atlantic Herring Fishery Management Plan management areas and statistical areas. River herring removals spatial stratification areas were defined as Gulf of Maine (GOM), Cape Cod (CC), and Southern New England (SNE).

Count of sampled trips		Year										
		2005		2006		2007		2008		2009		Grand Total
Area	Gear	1	2	1	2	1	2	1	2	1	2	
CC	BT				2							2
	MWT		20		3	4	4	4	8	1	10	54
	PS											
GOM	BT		4		3		3		2		2	14
	MWT	30	65	3	12	5	3	7	9	9	28	171
	PS	4	35				10	10	16	13	21	109
SNE	BT			5		7	2	2		7	2	25
	MWT	21	4	23		5	1	21	3	28	1	107
	PS											
Grand Total		56	130	32	22	22	25	45	40	59	66	482

Count of landing trips		2005		2006		2007		2008		2009		Grand Total
		1	2	1	2	1	2	1	2	1	2	
CC	BT		1		4		1		1	1		8
	MWT	4	48	20	77	27	43	11	29	1	15	275
	PS			2								2
GOM	BT	1	27		36		227		29		57	377
	MWT	140	339	143	270	79	37	17	69	13	94	1201
	PS	25	174	25	147	52	311	53	193	53	168	1201
SNE	BT	22	25	71	38	154	31	62	16	104	37	560
	MWT	139	11	174	18	164	10	126	15	172	4	833
	PS											
Grand Total		331	625	435	590	476	660	269	352	344	375	4457

		2005		2006		2007		2008		2009	
Percent coverage		1	2	1	2	1	2	1	2	1	2
CC	BT		0.00				0.00		0.00	0.00	
	MWT	0.00	0.42	0.00	0.04	0.15	0.09	0.36	0.28		0.67
	PS			0.00							
GOM	BT	0.00	0.15		0.08		0.01				
	MWT	0.21	0.19	0.02	0.04	0.06	0.08	0.41	0.13	0.69	0.30
	PS	0.16	0.20	0.00	0.00	0.00	0.03	0.19	0.08	0.25	0.13
SNE	BT	0.00	0.00	0.07	0.00	0.05			0.00	0.07	
	MWT	0.15	0.36	0.13	0.00	0.03		0.17	0.20	0.16	
	PS										

Not sampled

less then 3 samples

No samples or landings

Table 2: Sampling coverage by year, gear type and area. Top panel: count of sampled trips. Middle panel: count of trips landing Atlantic herring. Bottom panel: percent coverage. Cells with less than 3 observed trips were not used in estimation. CC is Cape Cod, GOM is Gulf of Maine, SNE is Southern New England, BT is bottom trawl, MWT is paired and single midwater trawl, and PS is Purse Seine.

Challenges Linking Fishery Datasets

Trips observed at-sea (NEFOP) were linked to the VTR database by the VTR serial number as recorded by the at-sea observer. This poses difficulties when a vessel fishes in more than one statistical reporting area on a single trip because recording protocols differ between at-sea observer reports and VTRs. According to regulations, the vessel's captain is required to fill out a separate VTR log when crossing statistical area boundaries during a trip. However, at-sea observers do not fill out a separate trip report to coincide with the new VTR log. Instead, at-sea observers link records using the VTR serial number from the 1st VTR log.

A comparison of Atlantic herring catches as reported by observer reports and VTRs suggest that substantial differences occur between the two reporting systems (Appendices A and B). Some of the differences between observer reports and VTRs in this dataset could be explained by these reporting requirements if vessels fished in more than 1 statistical area on a trip. The direction of the bias would lower captain's hail weight for Atlantic herring compared to observer record for a given trip. Other differences can be attributed to the handling of pair-trawls, especially in the early years of the time-series. Further analysis can be found in Appendix A and B.

Calculations. Two methods were used to examine and estimate river herring removals from the directed Atlantic herring fishery. Both methods are based on the Standard Bycatch Reporting Methodology (SBRM) amendment (2007). In general, Method 1 uses the ratio of river herring to Atlantic herring for the expansion, while Method 2 extrapolates to the trip level by using the mean discard level per trip.

Method 1. Following Lohr (1999) and Cieri et al (2007), the ratio estimate (R) for each grouping was calculated using the form:

$$\hat{R}_g = \frac{\sum_i r_{g,i}}{\sum_i A_{g,i}}$$

where $r_{g,i}$ is the observed river herring bycatch (pounds) from trip *i* in grouping *g* and $A_{g,i}$ is the Atlantic herring landings (pounds) for trip *i* in grouping *g*.

Its variance is estimated by:

$$\text{var}(\hat{R}_g) = \frac{1}{n_g \overline{A}_g^2} \frac{\sum_i (r_{g,i} - \hat{R}_g A_{g,i})^2}{n-1}$$

where n_S is the number of observer observations and A_g bar is the mean of Atlantic herring observer landings for grouping g.

Total river herring bycatch (D) for each grouping was calculated as:

$$\hat{D}_g = \hat{R}_g \cdot K_g$$

where K_g is the total Atlantic herring catch/landings from grouping *g* (year, quarter, area, and gear type).

The variance $\text{Var}(D_{g)}$ was estimated by:

$$Var(D_g) = \text{var}(\hat{R}_g) \cdot L_g$$

Because estimates across gear types were desired within the groupings, estimates by gear type were combined by strata, defined as area, half year, and year.

Therefore the sum of the river herring removals were:

$$\hat{D}_s = \sum \hat{D}_{Gg}$$

Where $D(\text{hat})_S$ is the total river herring removed within a half year, year, area stratum and $D(\text{hat})_{Gg}$ is the river herring removals by gear type within a grouping.

As such the combined variance was calculated as:

$$Var(D_S) = \sum Var(D_{Gg})$$

Landings and catch data were generated by querying the NMFS VTR database for targeted trips (landed more than 2,000 lbs of Atlantic herring). This database gives location, date, time, and gear type used. Generally catch and landings are interchangeable for Atlantic herring as the reports of discards in the VTRs are small.

Method 2. Because of concerns about the previous method, a second method was used to examine and estimate river herring removals from the directed Atlantic herring fishery (Appendices A and B). Here the NEFOP and VTR data were grouped as before, where groupings consisted of gear, half years, years, and areas. To estimate river herring removals the Simple Expansion Method was used (SBRM 5.4.2.3. Simple Expansion Method: mean discard per trip, pp 143)

As such, river herring removals by groupings were calculated as:

$$\hat{D}_g = \sum_i N_g \left(\frac{\sum_i d_{ig}}{n_g} \right)$$

Where D_g is the removals of river herring in a grouping (half year, year, area and gear) N_g is the total trips from the VTR for that grouping, d_{ig} is the observed removals of river herring on trip i in grouping g and n is the total observed trips in that grouping.

Because estimates across gear types were desired within the groupings estimates by gear type were combined within a strata, defined as area, half year, and year.

As before the sum of the river herring removals were:

$$\hat{D}_s = \sum \hat{D}_{Gg}$$

Where $\hat{D}_S$ is the total river herring removed within a half year, year, area stratum and $\hat{D}_{Gg}$ is the river herring removals by gear type within a strata.

Variance was calculated using a derivation of the SBRM equation 19 to produce a variance estimate for each half year, year, and area stratum:

$$\mathrm{var}\left(\hat{D}_s\right) = \sum N_g^2 \left(\frac{N_g - n_g}{N_g}\right) \left(\frac{\sum d_{ig}^2 - \frac{\left(\sum d_{ig}\right)^2}{n_g}}{n_g\left(n_g - 1\right)} \right)$$

Where N_g is the number of VTR trips in a grouping d_{ig} is the observed removals of river herring in trip i by gear type, area, half year, and year, and n_g is the observed trips in the grouping.

After consideration of percentage coverage by grouping (see Table 2), it was decided to collapse the half year estimates to the full year estimates, allowing for the use of observed trip by area, gear and year across both half years. This produced fewer dropped strata and more robust sample sizes (Table 2). As such, both methods outlined above were repeated with gear, area, and year groupings and subsequent area, year strata. For convenience error is expressed as CV of the stratum as calculated by:

$$CV_s = \frac{\sqrt{Var\left(\hat{D}_s\right)}}{\hat{D}_s}$$

Results from Method 1 and Method 2 are given in Tables 3 and 4 and Figure 2 for full years and Tables 5 and 6 and Figure 3 for half years.

Estimates of River Herring Removals

As can be seen by the tables and figures, in general the Cape Cod (CC) area and the Gulf of Maine (GOM) had lower removals of river herring when compared to Southern New England (SNE). Also both CC and GOM had similar removal levels of river herring by the directed herring fleet (Tables 3-6 and Figures 2-3).

The variability, both between methods and among years, makes comparison of historical removals by area less meaningful then other fisheries. For example, using Method 2, median removals in CC were approximately 15% of the SNE removals. However, the yearly removals for CC (2005-2009) ranged from 0 to 1.5 million lbs while the range for SNE was from 170 to 730 thousand lbs using Method 1. Likewise in 2006 for SNE, Method 1 and Method 2 differ by

almost 150,000 lbs or 50%. A statistical comparison of the results from Method 1 and Method 2 can be found in Appendix C.

Year	2005	2006	2007	2008	2009
CC	137.8 (-30.3 to 305.9)	0.0 (No River herring)	1,282.2 (-948.8 to 3513.2)	81.4 (-48.8 to 211.6)	0.2 (-0.3 to 0.7)
GOM	80.8 (-37.2 to 198.8)	38.7 (-31.7 to 109.1)	15.9 (-1.6 to 33.4)	254.5 (-198.5 to 707.6)	173.9 (17.4 to 330.4)
SNE	142.9 (-14.3 to 300.2)	178.7 (-50.0 to 407.3)	1256.5 (653.4 to 1859.6)	575.6 (-69.1 to 1220.2)	422.1 (118.2 to 726.0)

Table 3: Estimates of river herring catch in 000's lb (± 2 Standard errors) by year and area. Estimates made using Method 1 with gear, area and year as strata. CC is Cape Cod, GOM is Gulf of Maine, and SNE is Southern New England

Year	2005	2006	2007	2008	2009
CC	94.6 (9.5 to 179.8)	0.0 (No River herring)	1,159.7 (-510.5 to 2829.7)	93.4 (-44.8 to 231.6)	0.2 (0.0 to 0.4)
GOM	92.4 (-27.7 to 212.6)	66.2 (-66.2 to 194.6)	19.6 (-1.2 to 40.4)	294.0 (-170.5 to 758.5)	163.4 (45.7 to 281.0)
SNE	171.6 (51.5 to 291.7)	303.1 (84.9 to 521.43)	729.5 (160.5 to 1298.5)	585.0 (-11.7 to 1181.7)	603.3 (253.4 to 953.2)

Table 4: Estimates of river herring catch in 000's lb (± 2 Standard errors) by year and area. Estimates made using Method 2 with gear, area and year as strata. CC is Cape Cod, GOM is Gulf of Maine, and SNE is Southern New England

Year		2005		2006		2007		2008		2009	
half year		1	2	1	2	1	2	1	2	1	2
CC	Total catch	No samples	132.7	No samples	0.0	594.2	188.0	1.6	90.8	No samples	0.0
	-2SE		-29.2			-570.4	-191.8	-0.9	-43.6		
	+2SE		294.6			1758.8	567.8	4.1	225.2		
GOM	Total catch	0.2	84.1	0.0	34.7	11.7	5.3	0.0	345.1	1.9	191.8
	-2SE	-0.1	-38.7	0.0	-27.1	-10.3	1.2		-276.1	-1.7	15.3
	+2SE	0.5	206.9	0.0	96.5	33.7	9.4		966.3	5.5	368.3
SNE	Total catch	130.9	11.1	154.8	No samples	1263.4	No samples	690.0	5.0	338.6	No samples
	-2SE	-20.9	-13.5	-49.5		783.3		-27.6	-3.6	67.7	
	+2SE	282.7	35.7	359.1		1743.5		1407.6	13.6	609.5	

Table 5: Estimates of river herring catch in 000's lb (X ± 2 Standard errors) by half year (Jan-June and July-Dec) and area. Estimates made using Method 1 with gear, area and half year as strata. Cells with estimates= 0 and blank SE indicate that river herring were not found any sampled catch. CC is Cape Cod, GOM is Gulf of Maine, and SNE is Southern New England.

Year		2005		2006		2007		2008		2009	
half year		1	2	1	2	1	2	1	2	1	2
CC	Total catch	No samples	87.3	No samples	0.0	803.6	145.0	2.0	99.0	No Samples	0.0
	-2SE		12.2			-433.9	-34.8	0.2	-53.5		
	+2SE		162.4			2041.1	324.8	3.8	251.5		
GOM	Total catch	0.2	95.3	0.0	54.3	14.2	5.7	0.0	418.9	1.4	187.1
	-2SE	0.0	-30.5		-50.0	-6.5	-3.6	0.0	-259.7	1.2	44.9
	+2SE	0.4	221.1		158.6	34.9	15.0	0.0	1097.5	1.6	329.3
SNE	Total catch	177.8	4.8	234.8	No Samples	691.7	No samples	588.4	7.5	551.0	No samples
	-2SE	-7.1	-2.9	28.2		138.3		-11.8	-5.3	198.4	
	+2SE	362.7	12.5	441.4		1245.1		1188.6	20.3	903.6	

Table 6: Estimates of river herring catch in 000's lb (X ± 2 Standard errors) by half year (Jan-June and July-Dec) and area. Estimates made using Method 2 with gear, area and half year as strata. Cells with estimates= 0 and blank SE indicate that river herring were not found any sampled catch. CC is Cape Cod, GOM is Gulf of Maine, and SNE is Southern New England.

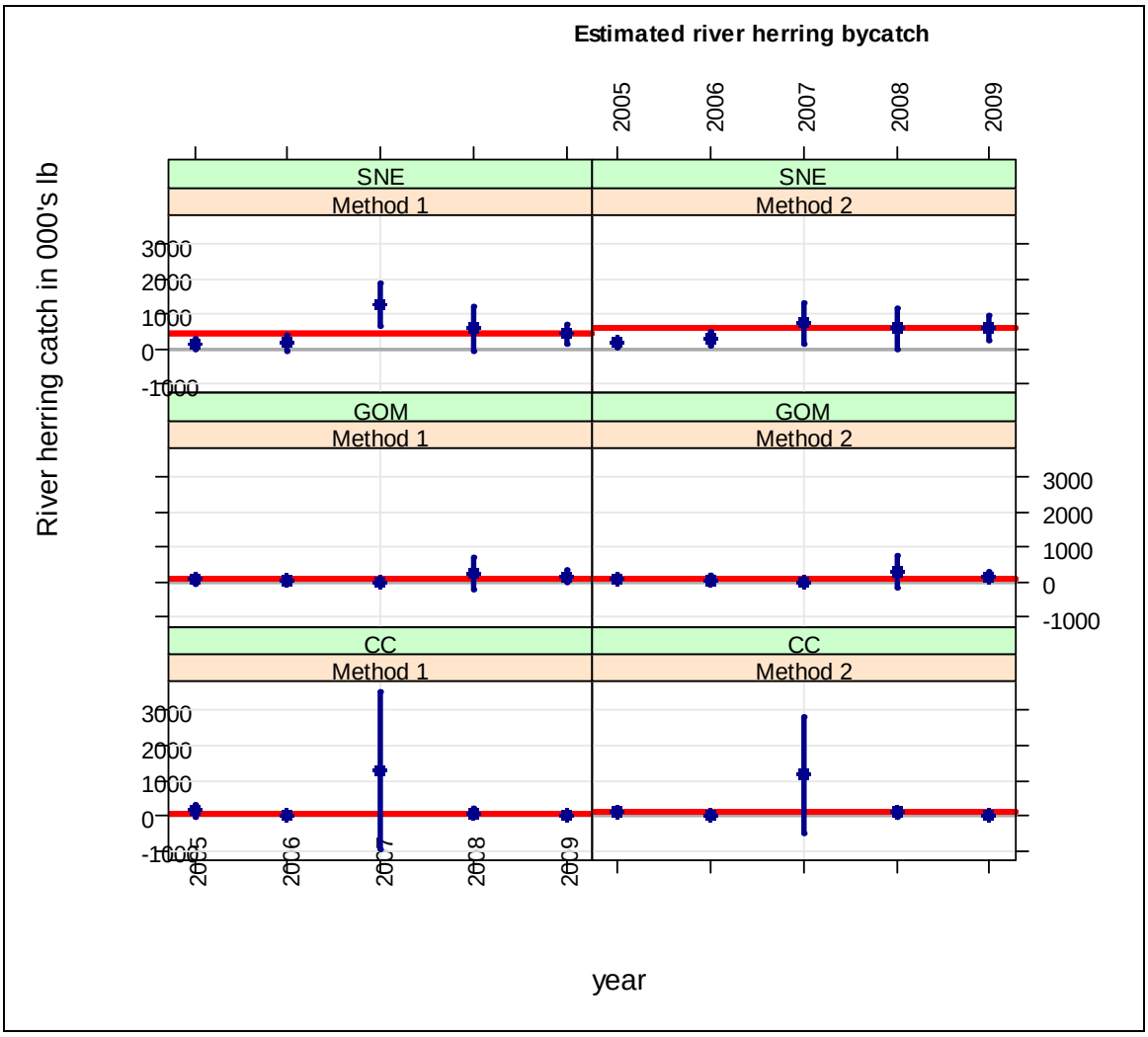


Figure 2: Estimates of river herring catch (000's lb) by method, area and year. Error bars are total catch ± 2 standard errors. Red line is the median of estimates within a panel. Gray line = 0. Both methods used gear, area and year as strata. CC is Cape Cod, GOM is Gulf of Maine, SNE is Southern New England.

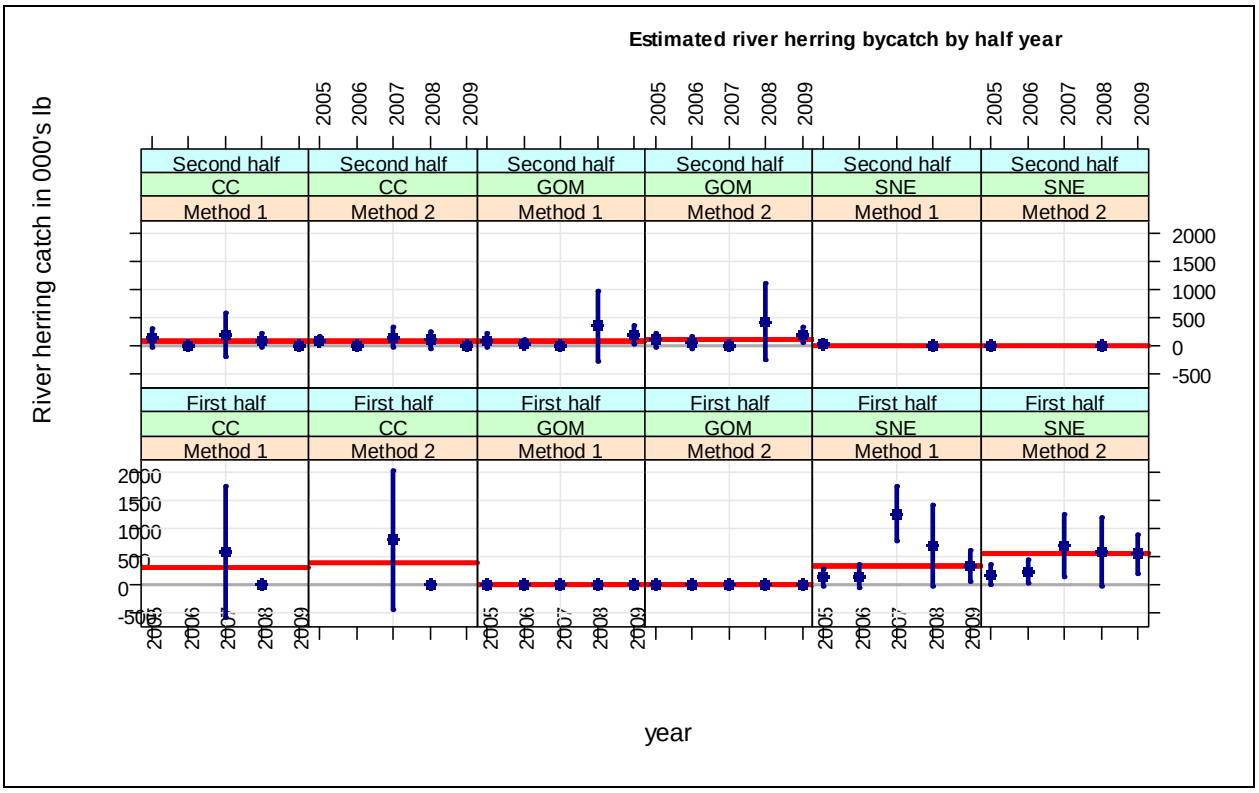


Figure 3: Estimates of River herring catch by method and area and year using half years as strata. Error bars are total catch ± 2 standard errors. Red line is the median of estimates within a panel. Both methods used gear, area and year as strata. CC is Cape Cod, GOM is Gulf of Maine, SNE is Southern New England.

Comparison of Mid-Water and Bottom-Trawl River Herring Removals

The directed Atlantic herring bottom-trawl fleet removes a relatively large amount of river herring given their low Atlantic herring landings; far higher than the mid-water trawl fishery per pound of Atlantic herring landed. Combined across years, the directed bottom-trawl fishery has removed an estimated 1.2 million lbs or approximately 48% of the total estimated removals by the total directed Atlantic herring fishery in the SNE area from 2005-2009 (Figure 4). In some years, removals can exceed those of the directed mid-water trawl fleet in this area by almost 4 fold. This level of removals of river herring is relatively large given that the directed bottom-trawl fishery for Atlantic herring only accounts for approximately 16% of the total catch of Atlantic herring in this management area. Despite this high removal rate, at-sea sampling of this fishery is particularly low when compared to other gears fishery wide.

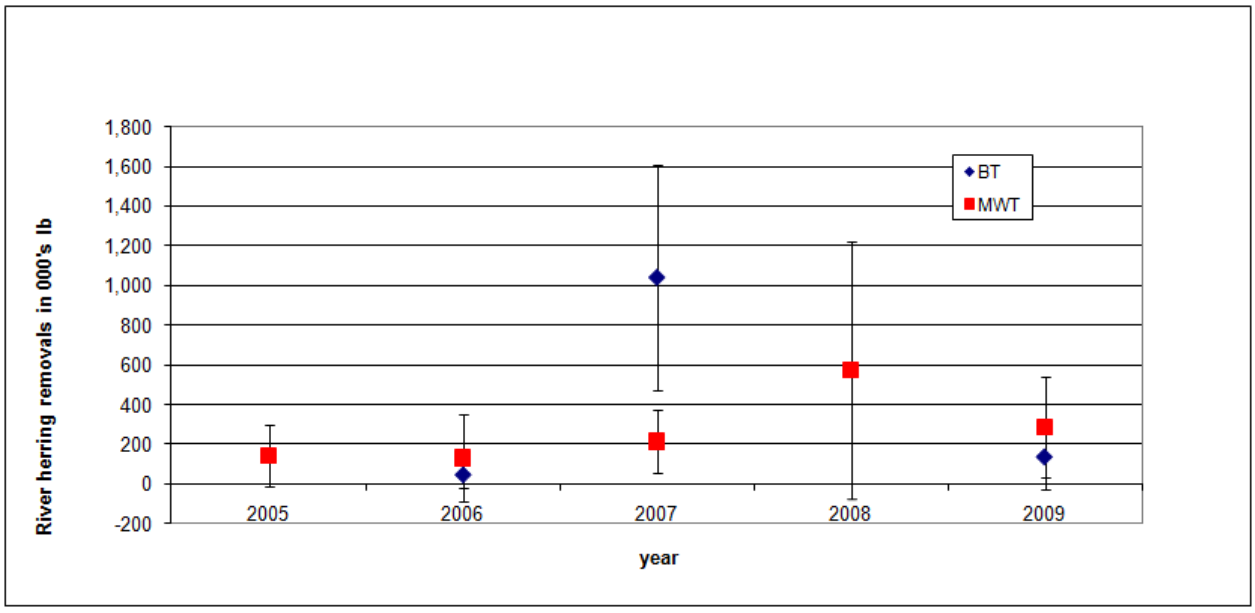


Figure 4: Comparison of river herring removals in 000's lb by bottom-trawl (BT) and mid-water trawl (MWT) gears in Southern New England. Error bars represent two standard deviations.

Conclusion

Our estimates of river herring removals have high uncertainty. Sampling by year, gear and area is not complete and missing strata exist in the dataset across years. The distribution of river herring catch has high variability and strata sample sizes are generally low. Finally, our estimate of uncertainty is likely to be underestimated because within trip variation of river herring catch is not propagated into the variation of the total catch estimate. Separating the strata into seasonal-area groups exacerbates the missing strata problems.

The non-sampling component of inter-annual variation for river herring catch can also include population dynamics such as year-class strength and population size, oceanographic conditions, and distribution of Atlantic herring fishing effort. The time series is currently too short to investigate whether these factors impact river herring catch in the Atlantic herring fishery. River herring do not currently have a stock assessment, thus the removal cap cannot be related to the river herring population. The cap only functions to prevent future river herring catch from exceeding recent catches. If river herring populations decline, then the cap may be too high for the river herring population. If a strong year-class is produced, then the cap may be set too low relative to the river herring population size, prematurely closing the Atlantic herring fishery.

The PDT has high confidence in describing times and locations where river herring bycatch has occurred in the directed Atlantic herring fishery. This information can be used to develop management plans to reduce the river herring interactions with the Atlantic herring fishery, without the need for defining a cap or estimating river herring bycatch within season.

In addition for reference, possible approaches to setting a catch cap and how a catch cap might interaction with other measures in A5 are explored in Appendix D and E, respectively.

PDT Consensus Statement

Given the variability, uncertainty, and challenges associated with sampling the Atlantic herring fishery, the Herring PDT cannot generate a precise enough estimate of river herring catch on which to base a cap. There may be some utility in applying a river herring catch estimate to trigger increased monitoring or other management approaches. However, the Herring PDT does not recommend developing quota-based approaches to river herring bycatch management in Amendment 5. Expected improvements to the catch monitoring program in Amendment 5 and completion of the forthcoming river herring stock assessment by ASMFC may create the necessary link between the cap and some measure of river herring stock status or reference point, as well as the mechanisms to monitor a cap. Other management approaches under consideration in this amendment (catch monitoring and hotspot alternatives) are more appropriate to consider at this time to address bycatch to the extent practicable.

Literature Cited

Cieri, M., G. Nelson, and M. A. Armstrong. 2008. *Estimates of river herring bycatch in the directed Atlantic herring fishery*. Report prepared for the Atlantic States Marine Fisheries Commission, Washington, DC. September 23, 2008.

Lohr, S. L. 1999. *Sampling: Design and Analysis*. Brooks/Cole Publishing Company: Pacific Grove, California.

New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council and National Marine Fisheries Service. 2007. *Northeast Region Standardized Bycatch Reporting Methodology: An Omnibus Amendment to the Fishery Management Plans of the New England and Mid-Atlantic Fishery Management Councils*. June 2007. 642p

Wigley, S. E. , J. Blaylock, P. J. Rago. 2009. River herring discard estimation, precision and sample size analysis. *Northeast Fish Science Center Reference Document* 09-20. US Department of Commerce.

Appendix A

Comparison of observer estimates and VTR estimates for river herring and Atlantic herring catches for 2006-2009

Prepared for the Herring PDT

By

Steven J. Correia

Massachusetts Division of Marine Fisheries

December 15, 2010

The Atlantic Herring PDT asked whether the amount of river herring catch was correlated with Atlantic herring catch.

Data

Dataset consists of 158 trips that had both observer estimates and VTR estimates of herring catch (Table A1). Data were provided by Matthew Cieri in excel spreadsheet OBD_HER_VTR_link2.xls dated 11.18.2010. Trips were selected as having 2,000 lb or more of kept Atlantic herring and were sea sampled by the NEFOP. Two trips were deleted that had observer data but no herring landings reported in the VTR. Trips were selected as having 2,000 lb or more of Atlantic herring and were sea sampled by the NEFOP.

Trips observed at-sea were linked to the Vessel Trip Report (VTR) database by the VTR serial number as recorded by the at-sea observer. According to regulations, the vessel's captain is required to fill out a separate VTR log when crossing statistical area boundaries during a trip. However, at-sea observers do not fill out a separate trip report to coincide with the new VTR log. Instead, at-sea observers link records using the VTR serial number from the 1st VTR log. Some of the differences between observer and VTR report in this dataset could be explained by differences in reporting requirements if vessels fished in more than 1 statistical area on a trip. The direction of the bias would lower captain's hail weight for Atlantic herring compared to observer record for a given trip.

Another issue occurs in matching records for paired trawls. In some cases observers are on one or both vessels, particularly early in the time series. In addition, vessels often pair with multiple vessels within a trip. This can contribute to discordance between observer and VTR records.

Relationship between Atlantic herring catch and river herring catch

Plots of river herring catch against observer reported and VTR reported Atlantic herring catch by trip are shown in Figures A1-A2. Data pairs with no reported river herring were excluded from the dataset because the zero river herring could represent a time-area combination when river herring are not available to the gear.

The magnitude of river herring catch appears to be independent of the magnitude of the Atlantic herring catch (measured by either observer reports or VTR) over much of the bivariate distribution (Figures A3-A4). Catches appear related at the lowest quantiles (0.05-0.10) of Atlantic herring and river herring bivariate distribution, but the bulk of the distribution shows no relationship between amount of river herring and Atlantic herring.

I tested for correlation using Pearson product moment correlation coefficient and Kendal's Tau on the arithmetic and log10 transformed data. Correlation between river herring and Atlantic herring was not significant on the arithmetic scale for either the VTR or observer estimates. Pearson product-moment correlation coefficients were low but statistically significant on the log transformed data (Table A2). These correlations are highly influenced by the linear relationship near the low end of the distributions ($< 10^{th}$ quantiles). Correlations were not significant based on Kendal rank correlation method.

Conclusions

The correlation between river herring and Atlantic herring are weak, and the magnitude of catches is unrelated over most of the bivariate distribution using either VTR or observer estimates of Atlantic herring. The PDT should consider alternative estimation methods such as estimating catch per trip and expanding catch within strata by number of trips rather than expanding by Atlantic herring catch.

	Bottom trawl					Purse seine				
Area	2006	2007	2008	2009	Total	2006	2007	2008	2009	Total
511							0	0	0	0
512							0	0	0	0
513	0	1		1	2			0	5	5
514		0	2	1	3					
515										
521	0				0					
522										
537		3		3	6					
539	5	4	1	3	13					
611										
612										
613				1	1					
615										
616										
total	5	8	3	9	25		0	0	5	5

	Midwater trawl					Paired midwater trawl				
Area	2006	2007	2008	2009	Total	2006	2007	2008	2009	Total
511		0			0		1			1
512										0
513	0		0	2	2	0		3	9	12
514	1		1	0	2	0	3	1	7	11
515		0	0	1	1			0	1	1
521		3	2	0	5		2	3	1	6
522			1	0	1	0	0	0	0	0
537		1	1		2	0		4	2	6
539	0		1		1			1		1
611	1				1	4		1	3	8
612	1			1	2	0		1	2	3
613			0	0	0			3	2	5
615			0	1	1				4	4
616								1		1
total	3	4	6	5	18	4	6	18	31	59

Table A1. Number of trips by gear type, year and statistical reporting area for trips with observed river herring catch. Empty cells indicate that statistical reporting area not sampled, zero's indicate that sampling occurred but river herring was not observed any sampled trip.

	Kendall's coefficient of rank correlation		Pearson product-moment correlation coefficient	
Source for Atlantic herring catch	Tau	P-value	r (95% CI)	P-value
Observer	0.06	0.37	0.24 (0.04-0.41)	< 0.05
VTR	0.08	0.22	0.30 (0.11-0.46)	<0.01

Table A2. Summary statistics for test of correlation between amount of River herring in trip (log10 lb) and the amount of Atlantic herring (log10 lb) in trip as reported by observer or VTR. All gear types and years combined. Number of pairs is 105.

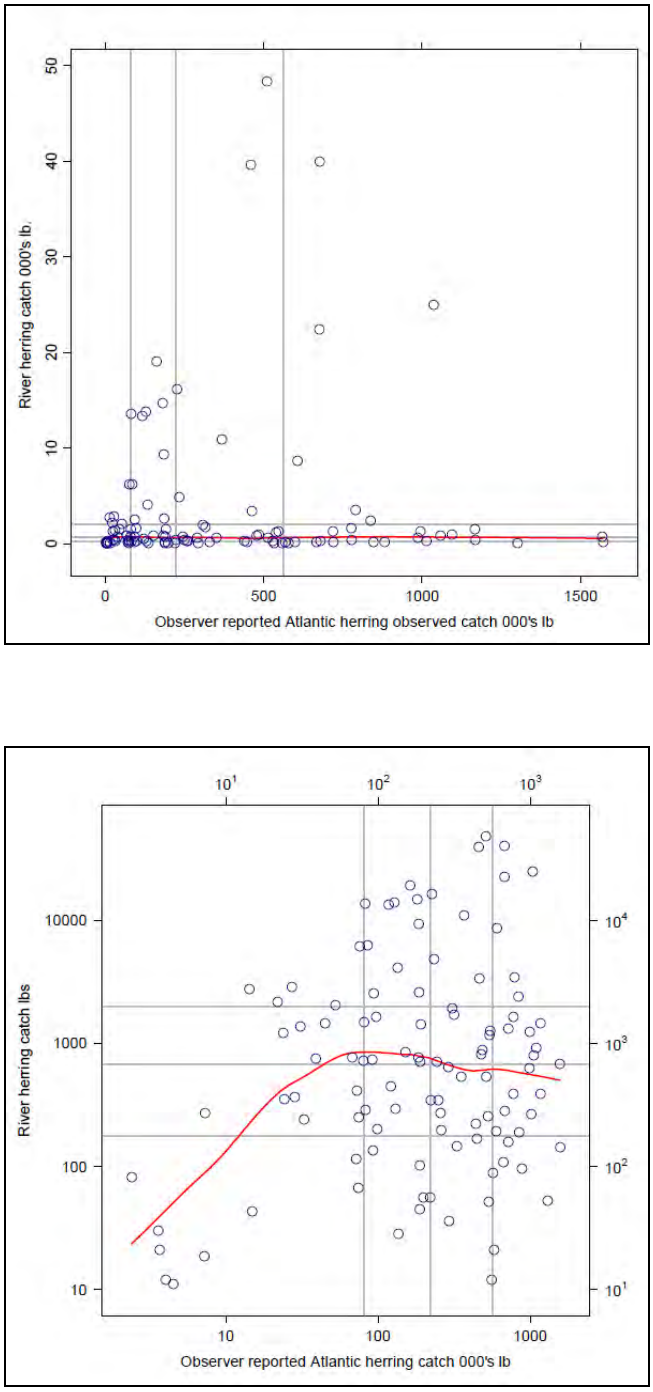


Figure A1. Scatterplot of river herring catch on Atlantic herring catch as reported by at sea observers. Top plot: arithmetic scales, bottom plot: logarithmic scales. Gray lines are 25th, 50th and 75th quantiles. Red line is loess fit with span=0.6 and degree=1.

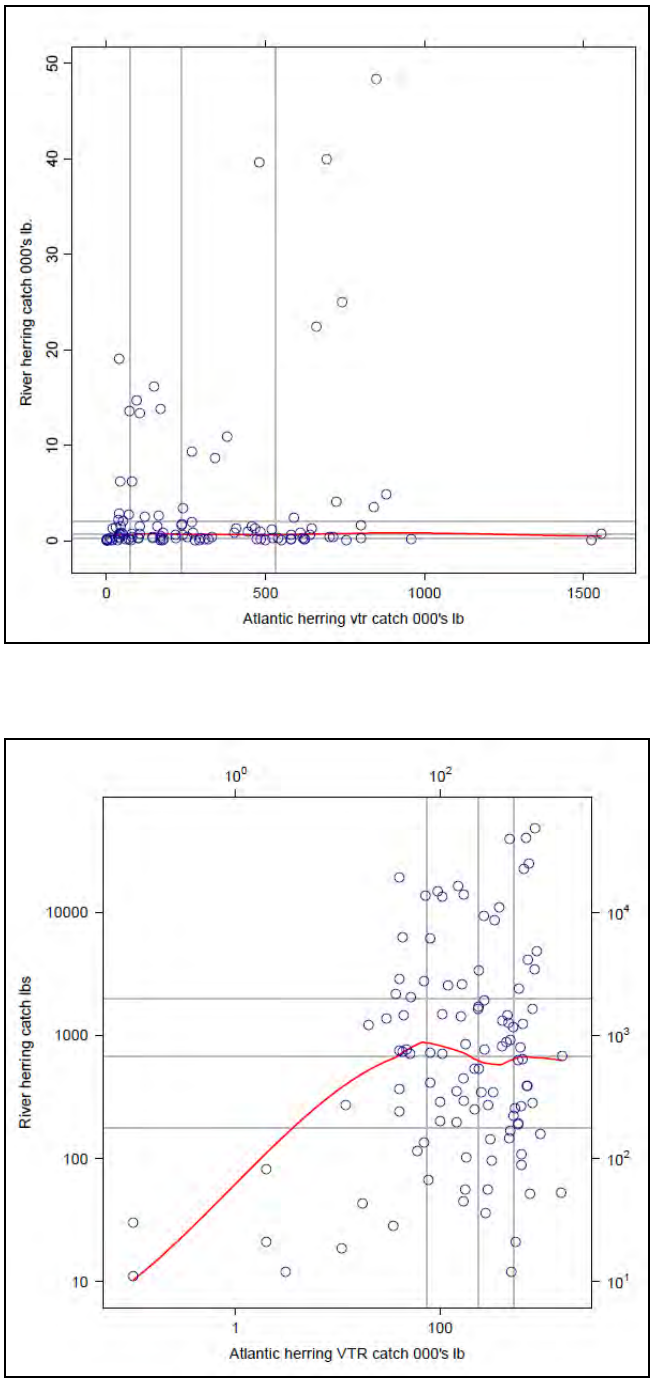


Figure A2. Scatterplot of river herring catch on Atlantic herring catch as reported in VTR. Top plot: arithmetic scales, bottom plot: logarithmic scales. Gray lines are 25th, 50th and 75th quantiles. Red line is loess fit with span=0.6 and degree=1.

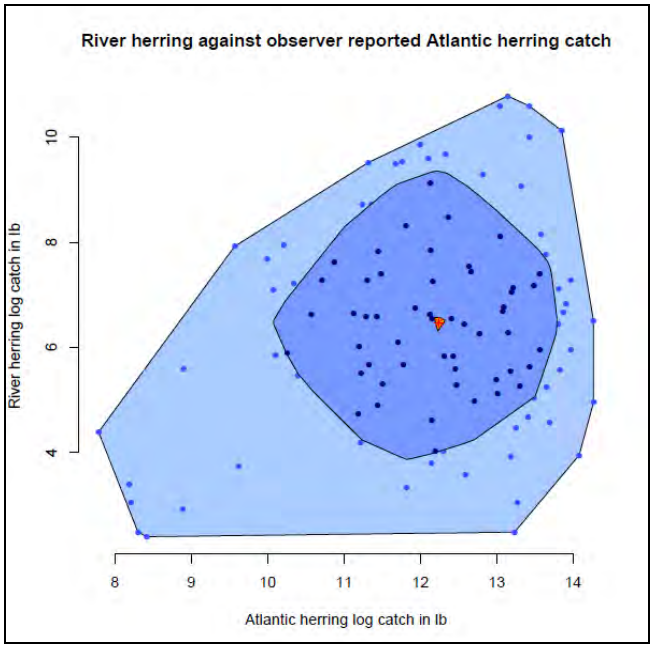


Figure A3. Bagplot of Log10 observed River herring catch against log10 Observer reported Atlantic herring catch. Red asterisk is location of bivariate median. Inner dark circle is middle 50% bivariate data with the greatest depth. The outer bag is 3X expansion of inner bag.

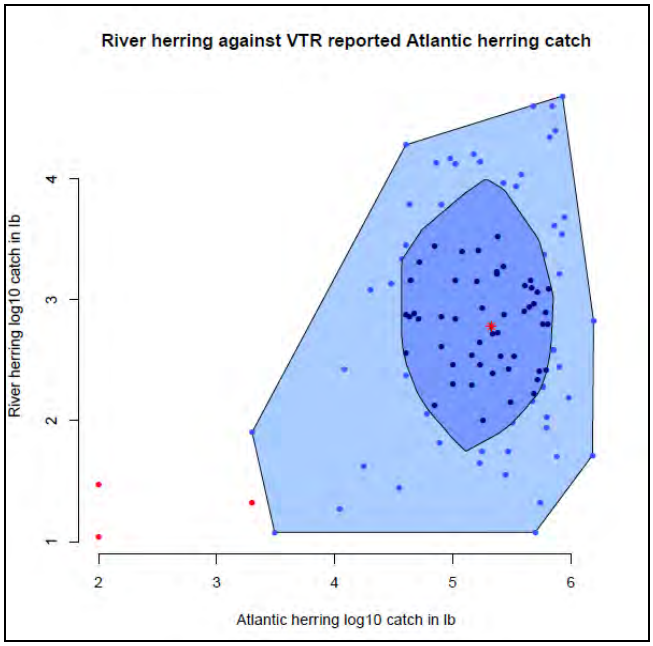


Figure A4. Bagplot of Log10 observed River herring catch against log10 VTR reported Atlantic herring catch. Red asterisk is location of bivariate median. Inner dark circle is middle 50% bivariate data with the greatest depth. The outer bag is 3X expansion of inner bag. Red points are considered "outside" values.

Appendix B

Comparison of observer estimates and VTR estimates for Atlantic herring for 2006-2009

Prepared for the Herring PDT

By

Steven J. Correia

Massachusetts Division of Marine Fisheries

December 15, 2010

The Atlantic Herring PDT is tasked with developing a river herring catch cap. This may require estimating river herring catch in recent years in order to provide a benchmark for setting a river herring cap. Raising the estimate of river herring catch at various strata (gear, area, and season) to the total will likely require the use of either observer reported or VTR reported catch. I provide some summary statistics on the difference between observer reported and VTR herring catch by gear, year and statistical reporting area. Summary statistics are also provided for the ratio of observer to VTR reported catch.

Data

Dataset consists of 158 trips that had both observer estimates and VTR estimates of herring catch (Table B1). Data were provided by Matthew Cieri in an Excel spreadsheet OBD_HER_VTR_link2.xls dated 11.18.2010. Trips were selected as having 2,000 lb or more of kept Atlantic herring and were sea sampled by the NEFOP. Two trips were deleted that had observer data but no herring landings reported in the VTR

Trips observed at-sea were linked to the Vessel Trip Report (VTR) data base by the VTR serial number as recorded by the at-sea observer. According to regulations, the vessel's captain is required to fill out a separate VTR log when crossing statistical area boundaries during a trip. However, at-sea observers do not fill out a separate trip report to coincide with the new VTR log. Instead, at-sea observers link records using the VTR serial number from the 1st VTR log. Some of the differences between observer and VTR reported catch in this dataset could explained by these reporting requirements if vessels fished in more than 1 statistical area on a trip. The direction of the bias would lower captain's hail weight for Atlantic herring compared to observer record for a given trip.

The number of trips by gear type, statistical reporting area and year is shown in Table B1. In general, few observations are available in paired area-year cells for bottom trawl and mid-water trawls. Sampling by year and area for paired-mid-water trawl occurred in 2008 and 2009. Purse seine samples are restricted to areas 511, 512, and 513, but sampling did not occur in 2006. Number of trips is summarized by gear and statistical reporting area in Table B2 and by gear type and year in Table B3.

As a result of small sample sizes, year, gear, and statistical area strata will likely be collapsed into larger units for estimation of river herring catch.

Differences between observer catch and VTR reported catch

A summary of differences between observer catch estimates and VTR by year for all gears combined is shown in Table B4 and by gear for all years combined in Table B5. Differences are highly variable within and among gear types. The distributions of differences by gear appear leptokurtic. Boxplots of the differences by year and gear type are presented in Figure B1. Differences appear to be biased for paired mid-water trawls in 2006 and 2007. I tested whether the median differences from significantly different from zero for each gear type using the Wilcoxon's signed-rank test (Table B8). A significant difference was found for paired mid-water trawl ($p<0.001$, pseudo-median difference=38,470 with 95% confidence interval of 18,436 to 66,880). Differences were not significant from zero for bottom trawls, mid-water trawls and purse seines. Boxplots of differences by gear type and area for all years combined are shown in Figure B2.

Bland-Altman plots of the differences by gear type (all years pooled) are presented in Figure B4. Variance in differences appears to increase with the mean of the paired estimates but bias is not related to the mean, with the possible exception of mid-water trawls. Paucity of sampling suggests that separating year, gear and area effects will not be possible.

Boxplots of differences by gear type, year and whether river herring were present in the catch are shown in Figure B3. The amount of bias does not appear related to the presence or absence of river herring.

Ratio of observer reports to VTR reports

The relationship between the variance and mean indicated in the Bland-Altman plot suggests that log transformation may be useful. Summary statistics for distribution of ratio by year (all gears pooled) and by gear (all years pooled) are shown in Tables B6 and B7. Boxplots of the log ratio (observer/VTR) by year are shown in Figure B5. The log transformation shortened the tails, and removed the relationship between the variance and mean. The distributions remained leptokurtic.

Conclusions

In-season estimation of river herring catch will require use of observer reported Atlantic herring catch by strata (statistical area, gear type, and season). Trip level differences and the ratio between observer and VTR estimates of kept Atlantic herring are highly variable and will contribute to uncertainty in the estimation of river herring catch.

	Bottom trawl					Purse seine				
Area	2006	2007	2008	2009	Total	2006	2007	2008	2009	Total
511					0		4	2	4	10
512					0		5	15	4	24
513	1	1		1	3			6	23	29
514		1	2	1	4					
515					0					
521	2				2					
522					0					
537		3		3	6					
539	5	5	2	5	17					
611					0					
612					0					
613				1	1					
615					0					
616					0					
total	8	10	4	11	33	0	9	23	31	63

	Midwater trawl					Paired midwater trawl				
Area	2006	2007	2008	2009	Total	2006	2007	2008	2009	Total
511		2			2		1			1
512					0	1				1
513	3		1	2	6	6		6	16	28
514	1		1	1	3		3	3	10	16
515		1	2	1	4			4	7	11
521		4	3	1	8	2	2	8	11	23
522			1	3	4	1	1	7	25	34
537		1	1		2			4	2	6
539	1		1		2	8		1		9
611	1				1	4		2	4	10
612	1			1	2			2	4	6
613			1	2	3			3	5	8
615			1	1	2				4	4
616								1		1
total	7	8	12	12	39	22	7	41	88	158

Table B1: Number of trips by gear type, year and statistical reporting area.

Statistical area	Gear type				Total	Number of gear types
	Bottom trawl	Purse seine	Paired mid-water trawl	Mid-water trawl		
511		10	1	2	**13**	**3**
512		24	1		**25**	**2**
513	3	29	28	6	**66**	**3**
514	4		16	3	**23**	**3**
515			11	4	**15**	**1**
521	2		23	8	**33**	**2**
522			34	4	**38**	**1**
537	6		6	2	**14**	**2**
539	17		9	2	**28**	**2**
611			10	1	**11**	**1**
612			6	2	**8**	**1**
613	1		8	3	**12**	**2**
615			4	2	**6**	**1**
616			1		**1**	**1**
total	**33**	**63**	**158**	**39**	**293**	

Table B2: Number of observed trips by gear type and statistical area for 2006-2009. Four trips were excluded from the analysis because either the observer or VTR reported no Atlantic herring catch.

Year	Bottom trawl	Purse seine	Paired mid-water trawl	Mid-water trawl	Total
2006	8		22	7	**37**
2007	10	9	7	8	**34**
2008	4	23	41	12	**80**
2009	11	31	88	12	**142**
Total	**33**	**63**	**158**	**39**	**293**

Table B3: Number of observed trips by gear type and year. Four trips were excluded from analysis because observer or VTR reported no Atlantic herring catch.

Year	min	12.5th	25th	median	mean	75th	87.5th	max	IQR	Inter-octile range
2006	-120.7	-26.3	0.0	86.4	155.3	248.4	330.5	959.3	248.4	356.8
2007	-944.2	-38.9	-3.8	8.1	40.4	39.5	164.1	1262.0	43.3	203.0
2008	-380.8	-87.8	-21.5	9.7	57.6	59.9	282.1	1240.0	81.4	369.9
2009	-645.9	-106.6	-37.6	-0.6	-7.4	29.9	79.2	448.1	67.4	185.8

Table B4: Summary statistics for differences between observer and VTR estimates for all gear types combined.

Gear	min	12.5th	25th	median	mean	75th	87.5th	max	IQR	Inter-octile range
Bottom trawl	-55.7	-12.9	0.4	-2.6	1.2	248.4	4.4	42.5	8.6	17.3
Midwater trawl	-944.2	-205.0	-4.9	-52.9	21.4	39.5	58.1	465.2	107.1	263.1
Paired Midwater trawl	-645.9	-93.8	23.5	78.2	128.1	59.9	309.0	1262.0	152.7	402.9
Purse seine	-380.8	-69.8	4.0	7.5	28.4	29.9	77.2	383.5	46.9	147.0

Table B5: Summary statistics for differences between observer and VTR estimates by gear types for all years combined.

Year	min	12.5th	25th	median	mean	75th	87.5th	max	IQR	Inter-octile range
2006	0.17	0.77	1.00	1.40	2.49	2.42	2.03	30.61	1.03	1.72
2007	0.19	0.64	0.90	1.12	2.13	1.32	1.51	5.09	0.61	1.49
2008	0.29	0.77	0.91	1.05	2.19	2.29	1.34	45.04	0.44	1.42
2009	0.27	0.73	0.86	1.00	1.34	1.08	1.12	4.32	0.26	0.61

Table B6: Summary statistics for the ratio of observer:VTR estimates for all gear types combined.

Gear	min	12.5th	25th	median	mean	75th	87.5th	max	IQR	Inter-octile range
Bottom trawl	0.20	0.68	0.83	1.01	3.41	1.20	1.54	45.04	0.37	0.87
Midwater trawl	0.19	0.57	0.72	0.86	1.08	1.17	1.43	3.88	0.45	0.86
Paired Midwater trawl	0.17	0.85	0.95	1.07	1.52	1.45	2.01	30.61	0.50	1.16
Purse seine	0.29	0.78	0.91	1.02	1.19	1.19	1.43	5.67	0.28	0.65

Table B7: Summary statistics for the ratio of observer:VTR estimates by gear types for all years combined.

Gear	Wilcoxon Statistic	P-value	Lower limit	Upper limit	Pseudo- median
Paired mid-water trawl	8539	<0.001	18,436	66,880	38,470
Mid-water trawl	285	0.146	-63,660	5,687	-20,432
Bottom trawl	237	0.447	-5,380	898	-1,397
Purse seine	1132	0.398	-7,099	16,201	6,950

Table B8: Summary of Wilcoxon signed rank test for differences between paired observer and reported VTR Atlantic herring estimates by gear type (all years pooled).

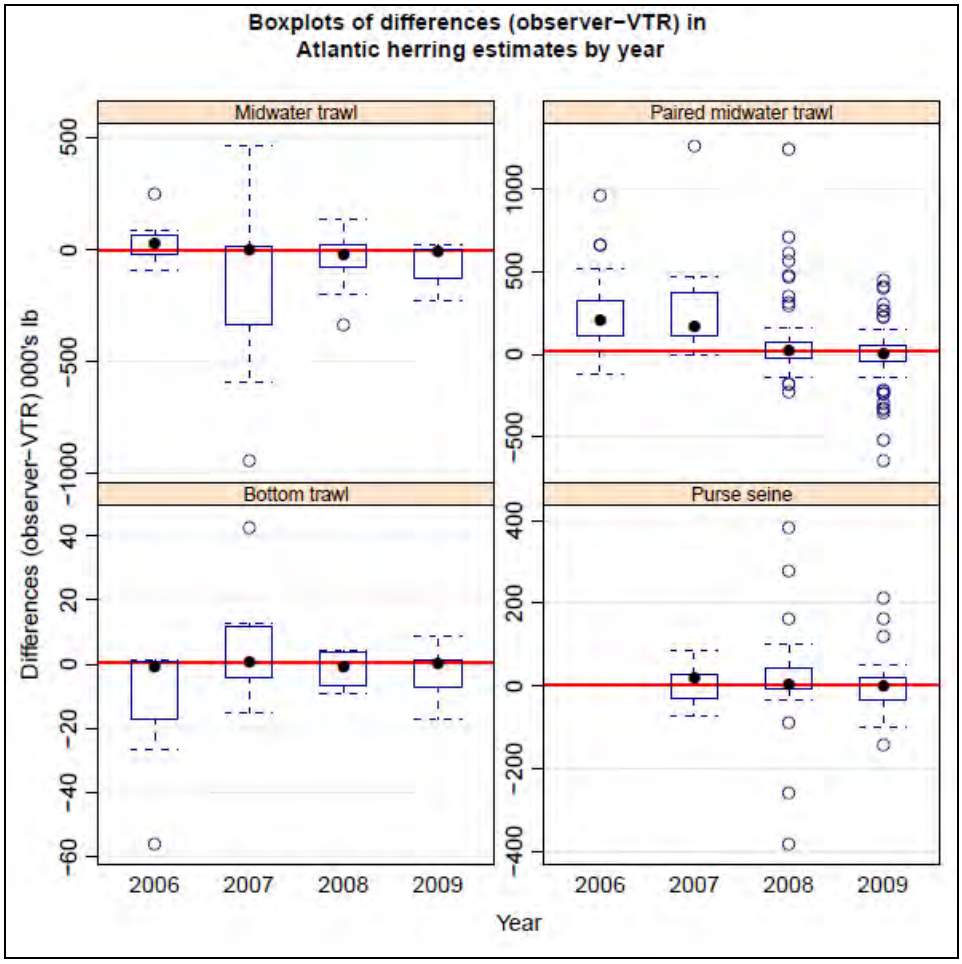


Figure B1: Boxplots of differences (Observer-VTR) in 000's lb by gear type for all years combined. Note that the y-scale differs by panel.

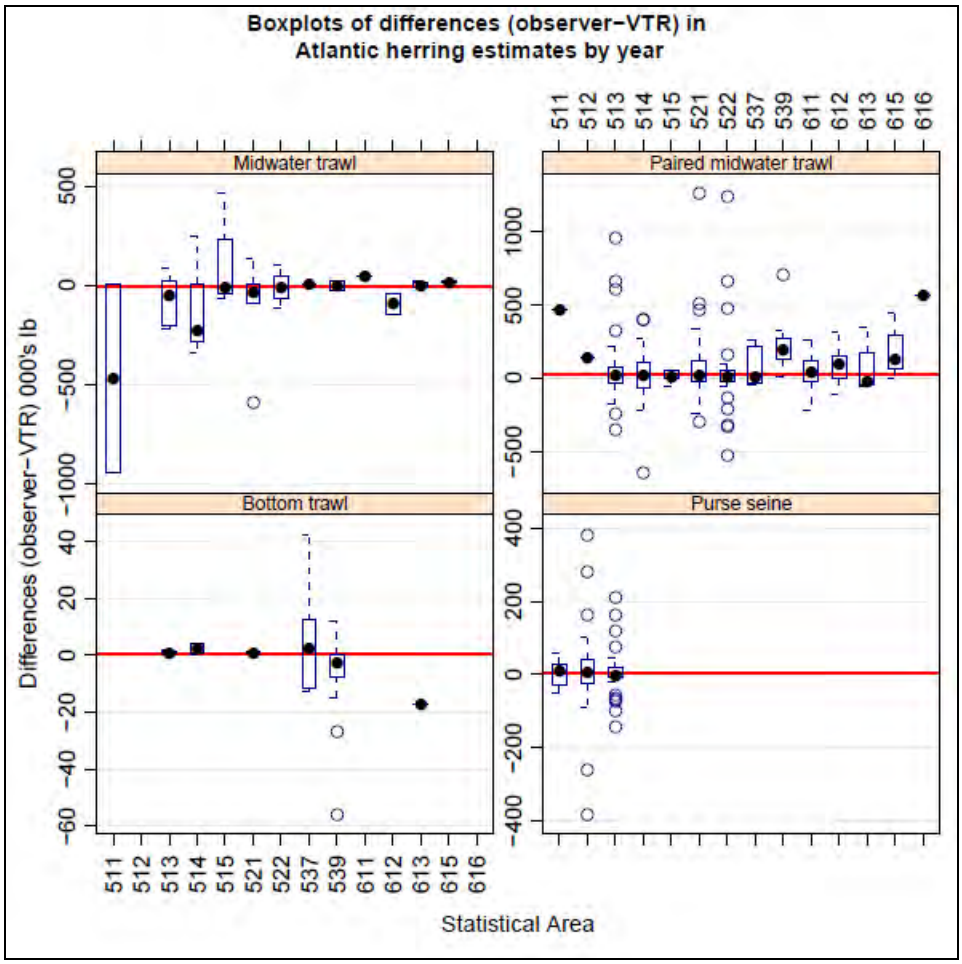


Figure B2: Boxplots of differences (Observer-VTR) by gear for all years combined. Note that y-scale differs by panel.

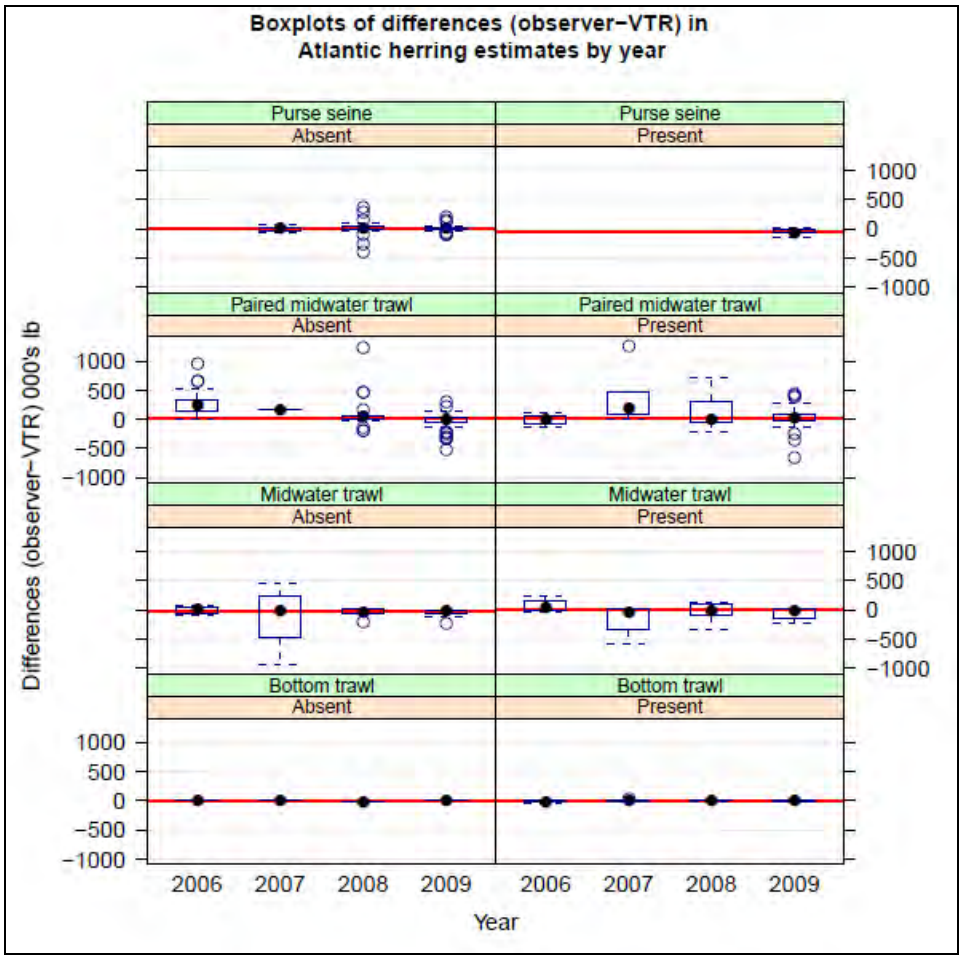


Figure B3: Boxplots of differences between observer estimates and VTR estimates by year, gear type and presence/absence of river herring. Redline is the median for all years combined.

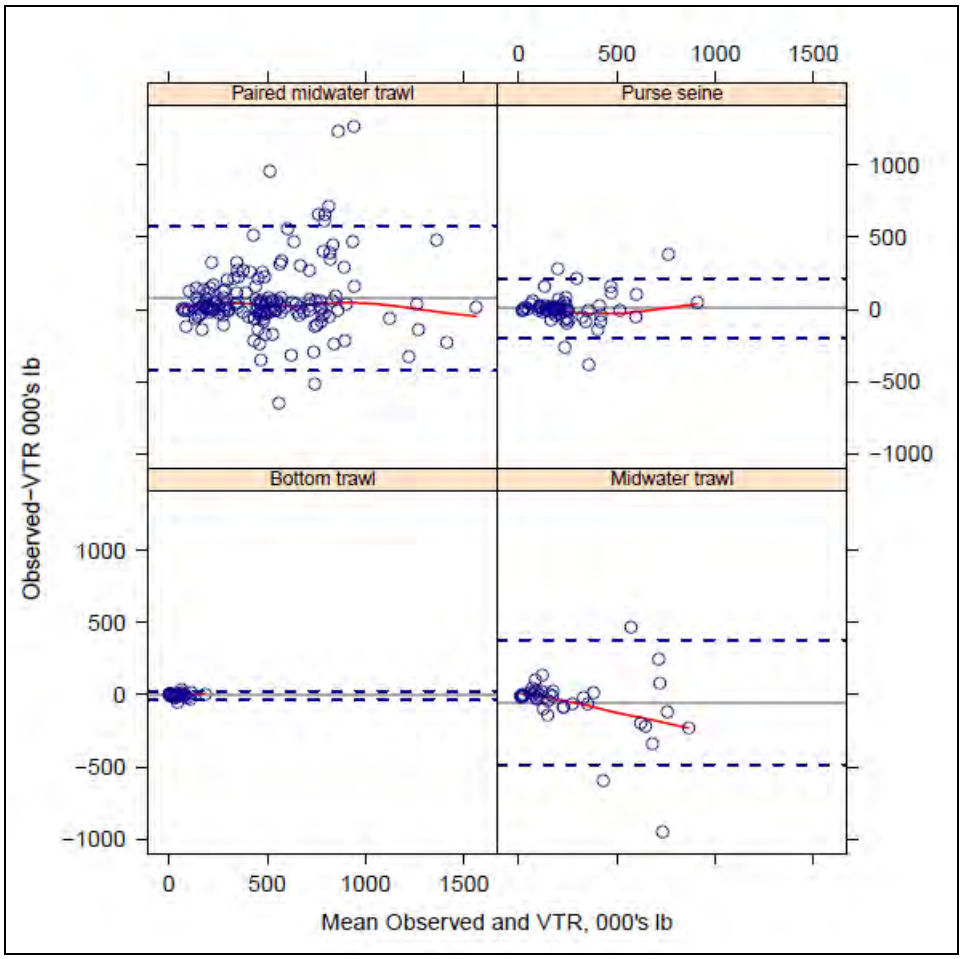


Figure B4: Differences (observer-vtr) against mean (observer and VTR) by gear type. Excludes observations where observer estimates=0. Gray line is the mean difference. Dashed blue lines are the mean +/- 2 standard deviations of the differences.

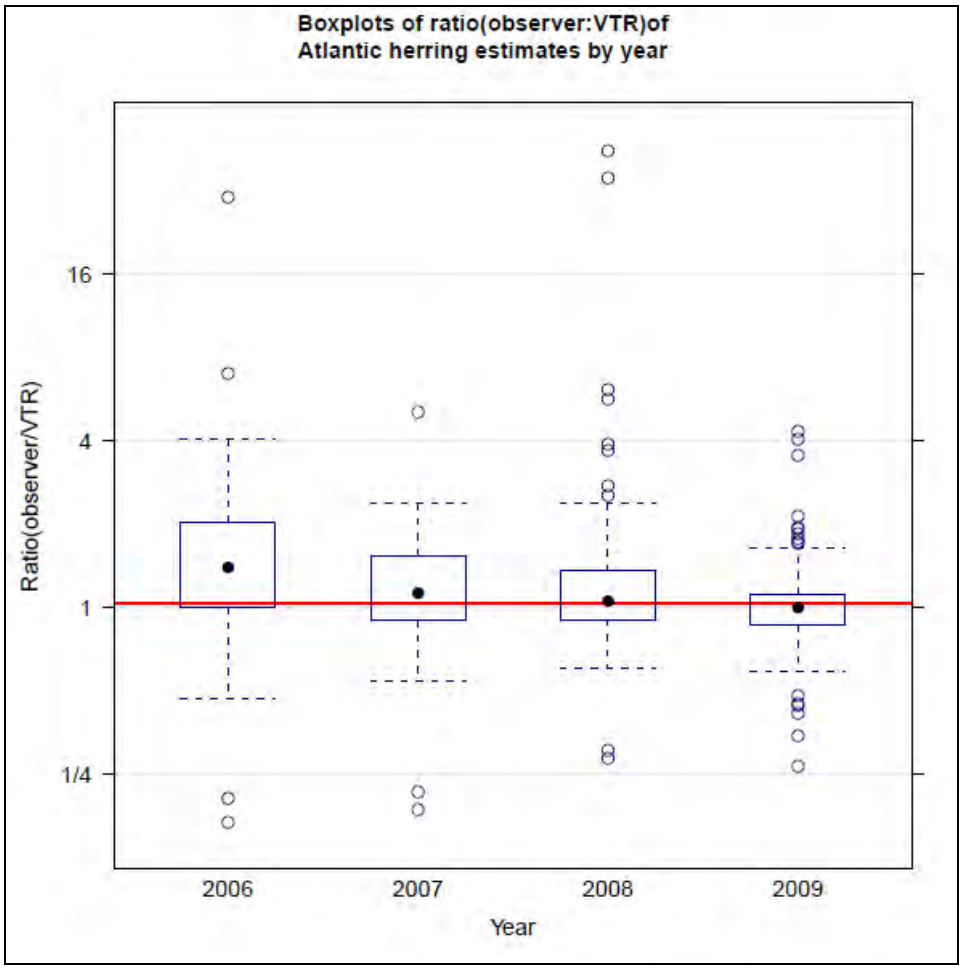


Figure B5: Boxplots of ratio (observer estimate: VTR estimate by year. Observations with observer estimate= 0 are excluded. Redline is the median for all years. Note y-scale is logarithmic.

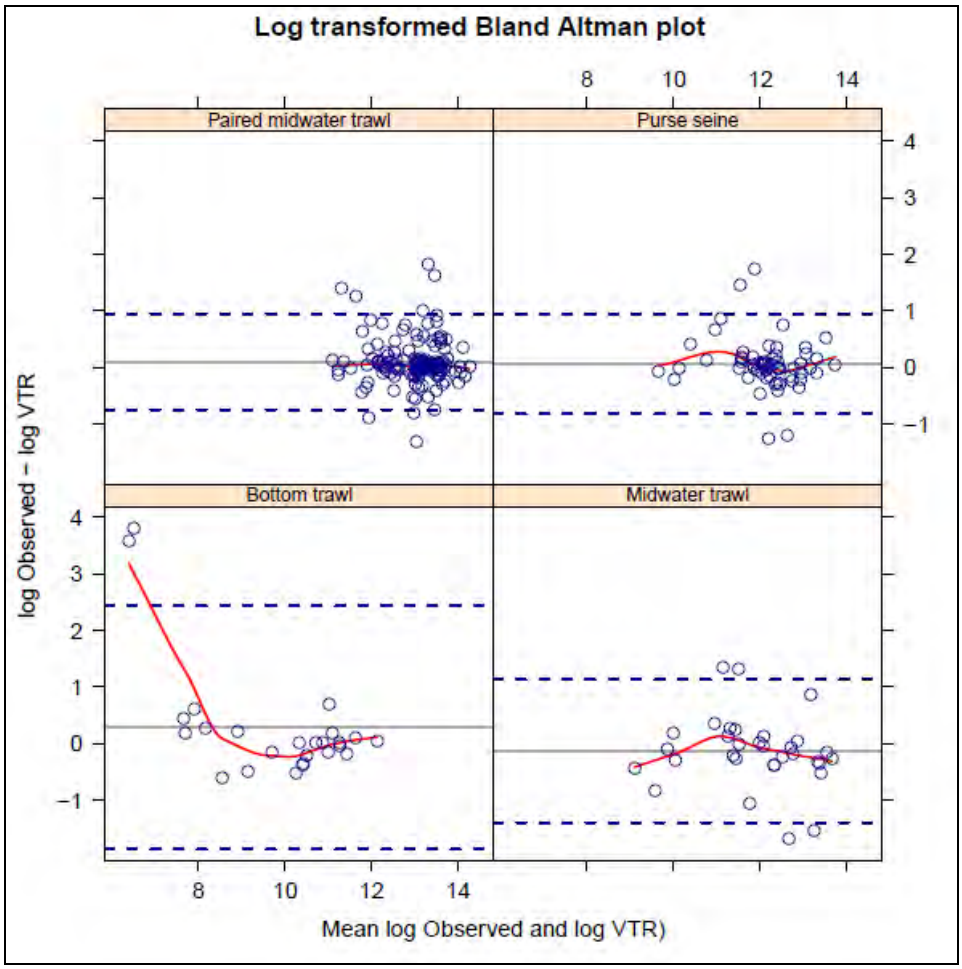


Figure B6: Log (observer/vtr) against mean log observer plus VTR. Excludes 2006 and observations where observer estimates=0. Gray line is the mean difference. Dashed blue lines are the mean +/- 2 standard deviations of the log (observer/VTR).

Appendix C

Comparison of river herring catches and CV's from Method 1 and Method 2

Prepared for the Herring PDT

By

Steven J. Correia

Massachusetts Division of Marine Fisheries

December 15, 2010

We compared the paired estimates of total river herring catches and CV's derived from Method 1 and Method 2 for both strata sets (whole year and half year). Pairs where no river herring=0 were dropped from the analysis. We tested for differences using the Wilcoxon signed rank test and the paired t-test on log-transformed data. All tests were two-sided.

Exploratory analysis suggests that the relationship between River herring catch estimates by method are likely multiplicative rather than additive (Figures C1-C4). The median paired difference (pseudo-median= -7,050 lb with approximate 95% CI -33,200 to 15,600 lb) was not significantly different from 0 (P=0.26). A paired T-test on the log-transformed pairs was not significant (P=0.36). The back transformed mean ratio was 0.95 with 95% CI of 0.86 to 1.06. This suggests that the differences in estimates by Method 1 and Method 2 are not consistent.

We conducted a similar analysis for the coefficients of variation. The median paired difference (pseudo-median=0.10 with approximate 95% CI 0.05 to 0.17) was significantly different ($p<0.001$). A paired T-test on the log-transformed pairs was significant (P=0.36). The back transformed mean ratio was 0.81 with 95% CI of 0.67 to 0.98. These results suggest that Method 2 provides a lower coefficient of variation than Method 1. That Method 1 provides higher CV's than Method 2 is not surprising given that the variance estimate in the ratio method is inflated by the lack of relationship between river herring catch and Atlantic herring catch.

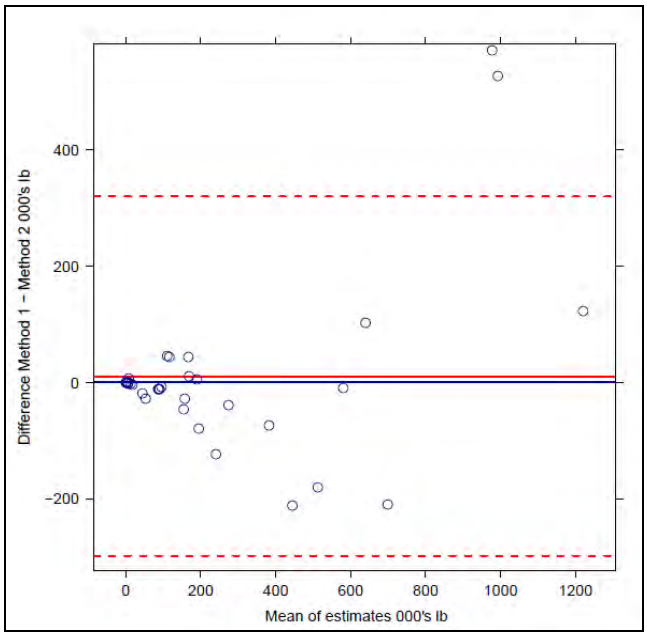


Figure C1: Comparison of river herring estimates using Method 1 and Method 2. Solid red line is mean difference (Method 1-Method 2). Dashed lines are mean difference ± 2 standard deviations.

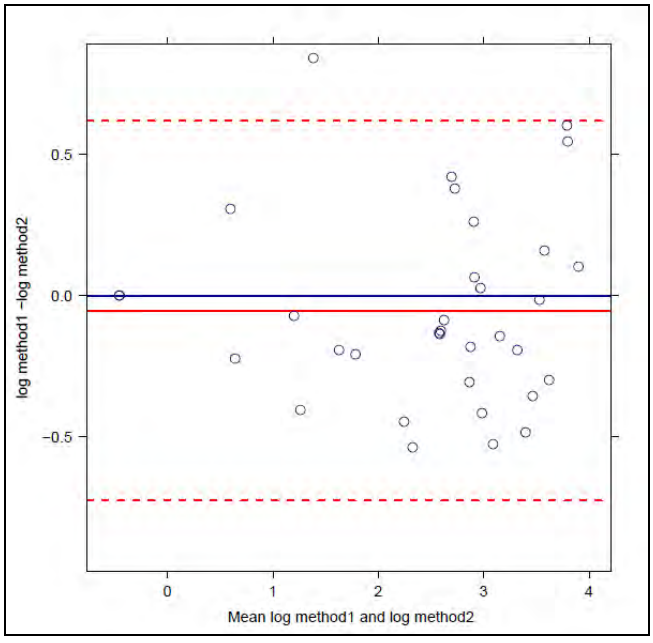


Figure C2: Comparison of river herring estimates using Method 1 and Method 2 on log transformed scale. Solid red line is mean difference (Method 1-Method 2). Dashed lines are mean difference ± 2 standard deviations.

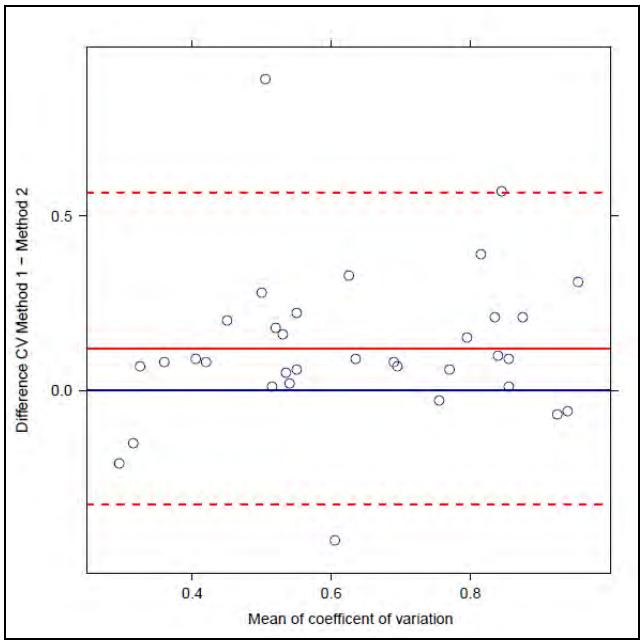


Figure C3: Comparison of river herring CV estimates using Method 1 and Method 2. Solid red line is mean difference (Method 1-Method 2). Dashed lines are mean difference ± 2 standard deviations.

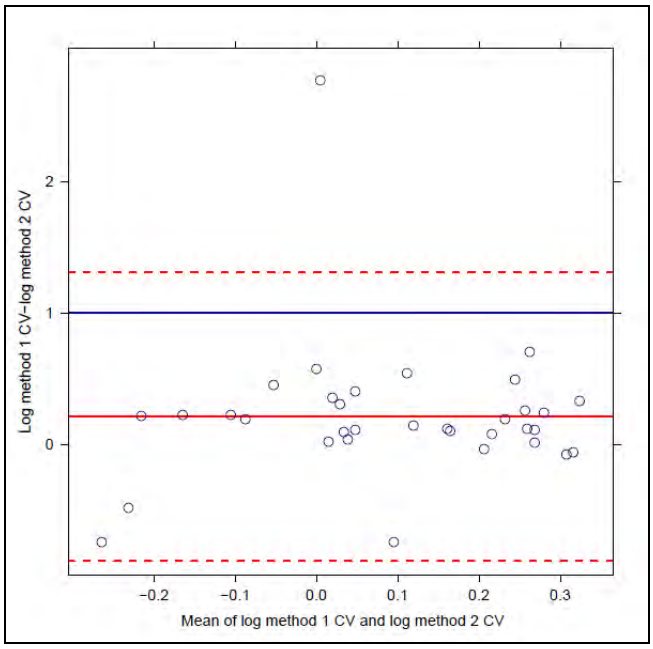


Figure C4: Comparison of river herring CV using Method 1 and Method 2 on log transformed scale. Solid red line is mean difference (Method 1-Method 2). Dashed lines are mean difference ± 2 standard deviations.

Appendix D

Possible Approaches to Setting a Catch Cap

The PDT did not agree on an approach to setting a catch cap at this time, but did discuss possible alternatives. Some of the options rely on the use of the catch history estimates described above, while others do not. The options include:

- Ceiling: Set a ceiling catch cap based on an average of recent river herring removals.
- Percentage: Set a ceiling catch cap as some percentage of the average of recent river herring removals. These can be set by area and half or full years.
- Stock Assessment: Allow the fishery to operate under the status quo option until a stock assessment is complete for river herring by ASMFC (2012) and therefore set catch caps relative to some measure of river herring stock status or reference point (e.g., Bmsy). Catch caps based on historical removals cannot account for changes in river herring abundance or availability. As such, river herring abundance may increase, while the catch caps would remain the same.
- Trips: Limit the number of hauls/sets or trips within Atlantic herring management areas (1A, 1B, 2, and 3) with river herring removals based on a threshold level of river herring removals per haul/set or trip. In other words, set a cap on the number of river herring encounters versus the amount of river herring catch.

Appendix E

Interactions with Other Measures in Amendment 5

The PDT discussed mechanisms to link the river herring hotspot analysis and spatial management measures with the river herring catch cap analysis. Linkages between a river herring catch cap and river herring spatial management measures could include:

- River herring catch cap applied in hotspot areas/times only. In which case the overall removals are not capped, as bycatch and further removals of river herring would likely occur outside of the defined hotspots. The more constrained the hotspots temporally and spatially the more likely this is to occur.
- River herring catch cap could be used as a catch trigger, i.e., a soft TAC that does not close the fishery when reached, but triggers a management action.
- River herring catch cap allocated by Atlantic herring management areas or by defined strata areas (specified above). The allocation would be determined using the hotspot analysis to weigh times/areas.

The PDT also discussed challenges for a catch cap approach given the current monitoring system.

- IVRs and VTRs are very difficult for "real time" use.
- VTRs have statistical area but not management area or groundfish closed area. Statistical area has been proven to be of very low data quality. VTRs give exact location for the starting tow or set. So you do know the management area and groundfish closed area, but not in real time as the vessel fishes in other locations within a statistical area.
- IVRs are not by the trip, but do identify Atlantic herring management area.
- The pre-trip notification system for the observer program asks if they are going into Closed Area 1, but does not distinguish other trips. The questions asked during the call cannot be changed in process without going through the regulatory and Paperwork Reduction Act process.
- There is variability associated with sampling a time, area and associated expansion. River herring removals could be over the cap but because of the variability associated with sample, would not appear so
- There might be data confidentiality limitations with making the river herring hot spot catches public - or being able to share catch information among the fleet in real time.
- A centralized reporting system for vessels to access while at sea should be supported.
- There are uneven and often low coverage rates in various areas.
    - Coverage has not been even in all areas that the fishery operates. For example during 2010, the NEFOP had to target 100% coverage if a vessel thought they may go into Closed Area I, while other areas are expected to meet or exceed 20%.
    - This is no spatial or temporal definition for coverage (and whether this is trips, seadays, or landings of herring).
    - Continued uneven coverage levels pose significant challenges in monitoring the cap during the fishing year.

Many of these challenges may be addressed under Amendment 5, which provides for options to improve the current catch monitoring program.

Appendix VIII

Discussion Paper:

Summary of Available Information and Management Approaches to Address Spawning Atlantic Herring

Prepared by the Herring Plan Development Team
(PDT) January 2011

Table of Contents

1.0 Background – Management Measures to Address Spawning Herring 1
2.0 Available Data on Herring Spawning Activity in Area 3 10
2.1 NMFS 10
2.2 Maine Department of Marine Resources 12
2.3 Vessel Monitoring System (VMS) Data 13
3.0 References 14

The purpose of this paper is to present available information pertaining to current management measures and the development of additional management measures to address spawning Atlantic herring. The intent of this document is to inform potential decisions that may be made during the development of Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP) or in future Council actions. The following summaries have been put together by the Herring Plan Development Team (PDT) members who have been involved in the development of Amendment 5 to the Herring FMP. This paper summarizes the history of the development of management measures to address spawning fish by both the New England Fishery Management Council and the Atlantic States Marine Fisheries Commission, as well as available information about spawning fish in both inshore and offshore areas.

1.0 BACKGROUND – MANAGEMENT MEASURES TO ADDRESS SPAWNING HERRING

Herring stocks in the Gulf of Maine/Georges Bank region are believed to temporally and spatially isolate themselves during spawning by returning to their natal spawning grounds to spawn in summer and fall. Spawning occurs in 5-90 m of water with eggs laid in "mats" over a variety of possible substrates ranging from boulders to sand to vegetation. Current and historical spawning locations are shown in Figure 1.

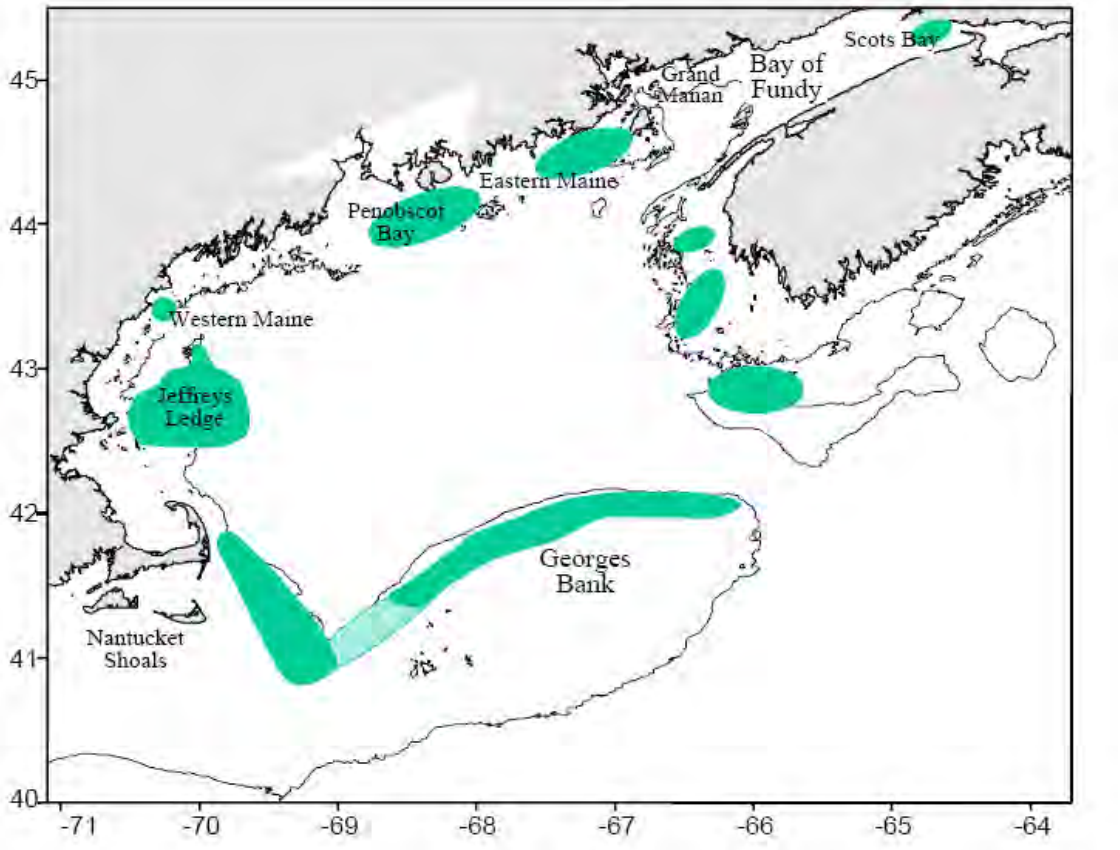


Figure 1. Generalized view of the current major herring spawning areas in the Gulf of Maine and on George Bank (from Overholtz et al. 2004).

Similar to other fish species that form large spawning aggregations, herring can be susceptible to fishing when spawning. The Atlantic States Marine Fisheries Commission (ASMFC) began formal spawning closures in 1994 as part of the 1993 Atlantic Herring Fishery Management Plan (FMP). These spawning closures were a continuation of an agreement among Maine, New Hampshire, Massachusetts, and Rhode Island, who had adopted a series of spawning closures in November 1983 as part of their Interstate Herring Management Plan. The1993 FMP included spawning protection for the entire range of Atlantic herring, including offshore areas such as Georges Bank. Foreign fishing from the late-1960s to the mid-1970s had depleted the offshore stock. Consequently, there were few spawning females in offshore areas. States sought to protect the new abundance of offshore spawning females when the population rebounded in the late 1980s and included offshore spawning restrictions.

The goals of the ASMFC FMP relating to the spawning closures were "*to maintain the U.S. northwest Atlantic sea herring resource at or above 20% of its maximum spawning potential for optimal utilization while reducing the risk of stock collapse*" and "*to provide adequate protection for spawning herring and prevent damage to herring egg beds*".

The 1993 ASMFC FMP required states to monitor the spawning closures by sampling commercial catch just prior to the automatic closure dates. Closures were delayed for one week if the average gonad somatic index (GSI) of mature females (International Convention for the Northwest Atlantic Fisheries [ICNAF] gonadal stages III – V) was below the threshold value for either size class (18% for fish ≥ 28 cm total length and 10% for fish between 24 and 28 cm total length). Additional one week delays were implemented if sampling indicated that at least one size class had not yet reached the threshold value. The FMP allowed some landing of spawning fish (tolerances). Tolerances varied between closure areas with a 25% spawn allowance by number in the eastern, central, and western Maine spawning areas and a 5% or 1,000 pound (whichever is greater) spawn allowance in New Hampshire and Massachusetts. Vessels were prohibited from fishing for, possessing, or landing any Atlantic herring containing spawn in all other areas.

Spawning closures boundaries are shown in Figure 2 and language specific to the 1993 ASMFC FMP follows.

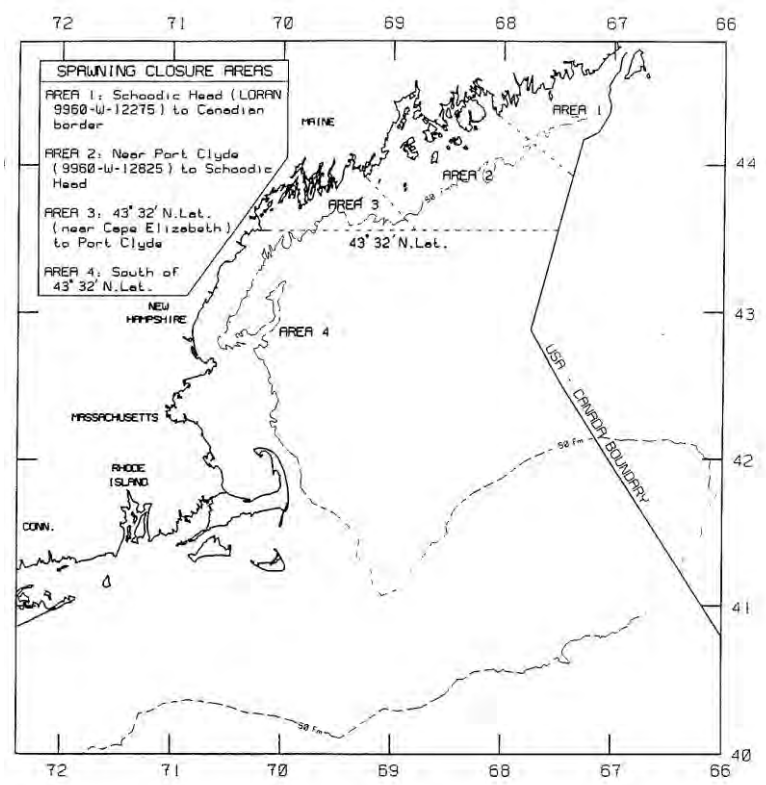


Figure 2. Spawning closure areas from 1993 Atlantic Herring Fishery Management Plan.

From *Section 6.2.3 Spawning Closures* of 1993 ASMFC FMP:

1. *A four week closure in eastern Maine beginning August 15 (unless samples of the commercial catch taken prior to the closure date indicate that females are delayed in reaching full maturity) during which time it is unlawful to fish for or take herring containing spawn (milt or roe) when they make up more than 25% by number of any load.*
2. *A four week closure in two additional areas in central and western Maine beginning September 1 subject to the same monitoring or maturity and 25% tolerance exceptions.*
3. *A three week closure beginning October 1 for the area south of 43˚ 32'N (Cape Elizabeth) that is <u>not</u> subject to any tolerance exceptions. The closure date in this area is subject, however, to successive one week delays if sampling indicates that spawning will be delayed (identical to provisions which apply in the three areas north of 43 ˚ 32' N). This closure is enforced jointly by the four states which are party to the Interstate Herring Management Plan.*

<u>Area 1</u> (eastern Maine) : area northeast of Loran C 9960-W-12275 (Schoodic Point) to the U.S.-Canadian border.

<u>Area 2</u> (central Maine) : area east (or north) of Loran C 9960-W-12825 (Small Point) to Loran C 9960-W-12275 and north of 43˚ 32' N.

Area 3 (western Maine) : area bounded by 43˚ 32' N (Cape Elisabeth) on the south and by Loran C 9960-W-12825 on the east (or north).

Area 4 : area south of 43˚ 32' N, including state and federal waters adjacent to Maine, New Hampshire and Massachusetts and the southern New England area.

The New England Fishery Management Council (NEFMC) first proposed spawning area closures as a part of its Atlantic Herring FMP in 1998. The measures were intended to be adjusted through framework actions which could be initiated when additional information on the timing and locations of spawning became available. Additional closures were also a possibility through a framework action, particularly in the lesser known offshore areas.

The proposed closures in the 1998 NEFMC FMP were considered necessary to ensure adequate protection of the herring resource. Herring fat content is at its peak during spawning, making them more economically valuable for human consumption, while concentrated spawning aggregations make herring susceptible to harvesting. In addition, spawning behavior of the uncaught herring was believed to be influenced by harvesting operations. At the time that the spawning closures were being considered, it was believed that protection of individual spawning populations would ensure successful recruitment across the entire stock complex. It was also believed that removal of fishing pressure during spawning would relieve the aforementioned stresses while also making it easier to accurately assess the extent and size of the spawning populations, as they would not be disturbed by fishing pressure.

The closures proposed by the NEFMC are shown in Figure 3. These areas were modified from the spawning closures implemented by the ASMFC 1993 Atlantic Herring FMP. Language specific to the proposed NEFMC FMP follows. The spawning closure dates in Management Area 1 were defined as:

Eastern Maine	*August 15 – September 11*
Western Maine	*September 1 – September 28*
Jeffreys Ledge/Stellwagen Bank	*September 15 – October 12*
Cashes Ledge	*August 1 – September 25*

Spawning closure dates are fixed. In an area closed to protect spawning, fishing for, harvesting, or possessing herring will not be allowed except for the following exception: vessels will be allowed to catch and possess up to 2,000 pounds of herring per trip. The amount of herring landed from a closed spawning area by one vessel in a day cannot exceed 2,000 pounds (this prohibits a vessel from making multiple trips in one day to exceed the 2,000 pound trip limit). This limit will be enforced based on calendar days and not on the basis of days-at sea used in any other management plan (for example, a groundfish days at sea running clock cannot be used to land more than 2,000 pounds of herring in one calendar day). Any fishing vessel transiting a closed spawning area and possessing more than 2,000 pounds of herring must have all fishing gear stowed as specified by the Regional Administrator.

Management Areas 2 and 3 were not considered for closures in the proposed measures of the NEFMC FMP because the offshore herring resource was considered robust and there was interest in developing the offshore fishery.

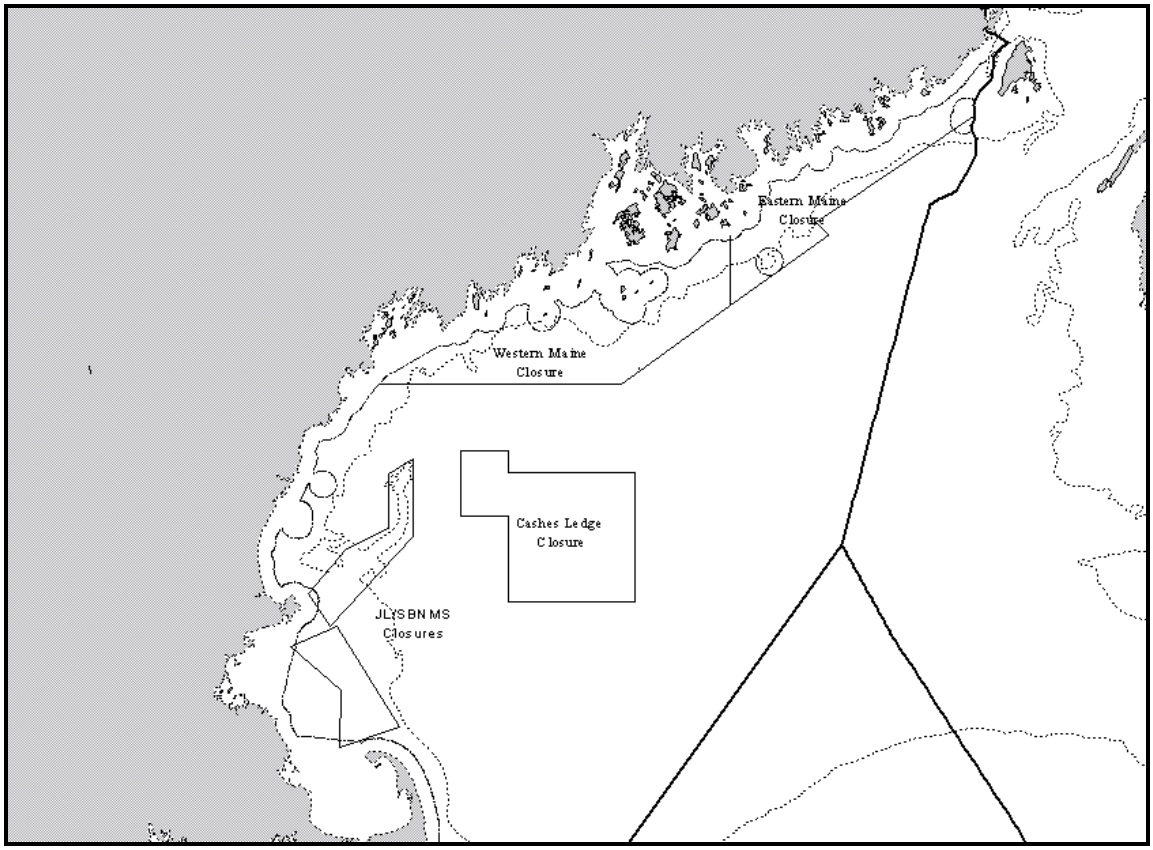


Figure 3. Herring Management Area 1 spawning closures (with approximate territorial sea boundary shown) proposed in the 1998 NEFMC Atlantic Herring FMP.

The proposed NEFMC closures in federal waters were also intended to complement the efforts of the ASMFC Amendment 1 (1999) measures (see below). The tolerance measures enacted by ASMFC allowed for some landing of spawn fish but enforcement was limited to landing regulations implemented by the individual States within ASMFC. The NEFMC developed its proposed measures out of concern that some states did not have the resources to implement and enforce the measures, which would have negated the spawning protection. The NEFMC's intention was to augment the efforts of the ASMFC by preventing the catch of spawn herring in federal waters.

In the proposed NEFMC FMP, the spawning area closures were predicted to increase cost and decrease revenue for the herring industry. Effort would have been shifted to where and when herring would be less aggregated and contain less fat. It was projected that one-third of the landings of the year prior to the proposed measures (1997) would have been closed to fishing in subsequent years as a result of the proposed action. This analysis was based on only one year of data, however, and may not have represented average fishing. A shift in effort as a result of the measures also was not considered. However, community impacts were projected to be minimal to non-existent because the NEFMC's proposed closures were smaller than those in the

ASMFC's 1993 plan, and other open areas closer to shore were made available for fishing to the potentially affected boats.

On October 27, 1999, the NEFMC received notification that the National Marine Fisheries Service (NMFS) Regional Administrator rejected the measures that would have created spawning area closures:

"I disapproved the spawning area closures because it was not demonstrated that the costs of imposing the closures outweigh the benefits, and the measure appears to be inconsistent with National Standard 7 in that conservation benefits are uncertain. The measure also appears to contravene the M-SFCMA, Sec. 303 (a)(1)(A). Further, the spawning closures would not apply to mobile, bottom-tending vessels, just to purse seiners and mid-water trawlers. Such fishing gear may also disturb spawning herring. Also, the Northeast Region Office of Law Enforcement stated that spawning area closures that allow the possession of herring on board pose enforcement problems. In consideration of the aforementioned and of concerns raised by commenters, and given the uncertainty of conservation benefits to be realized, a spawning closure at this time does not appear to be a necessary and appropriate conservation and management measure."

The ASMFC developed Addendum I as a result of NMFS disapproval to readdress the spawning measures that had been defined in ASMFC Amendment 1 (see following).

Amendment 1 (1999) to the ASMFC Atlantic Herring FMP replaced all previous ASMFC Atlantic herring measures including spawning closures. The goal of the new spawning measures was to protect distinct spawning units that are especially susceptible to fishing when they aggregate for spawning. The new spawning measures applied only to state waters within Management Area 1A (Figure 4) and did not include any measures to protect spawning fish in offshore areas such as Georges Bank. From August 1 through October 31, vessels were prohibited from taking, landing, or possessing more than 20% (by number) "spawn" herring containing roe or milt from state waters within Management Area 1A. Amendment 1 (1999) defined spawn herring as "ICNAF gonadal stages 4, 5, & 6."

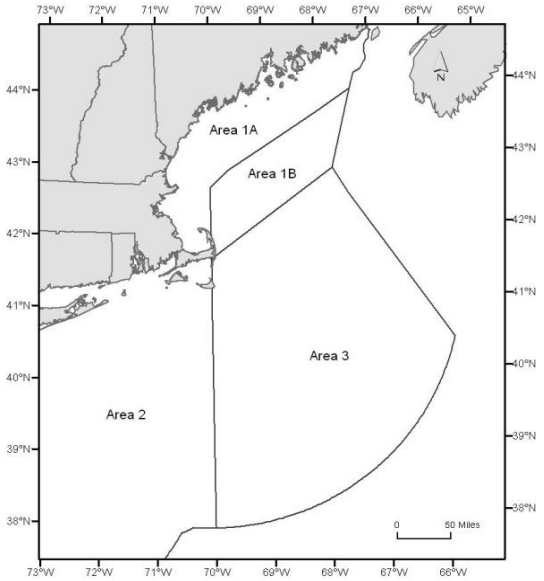
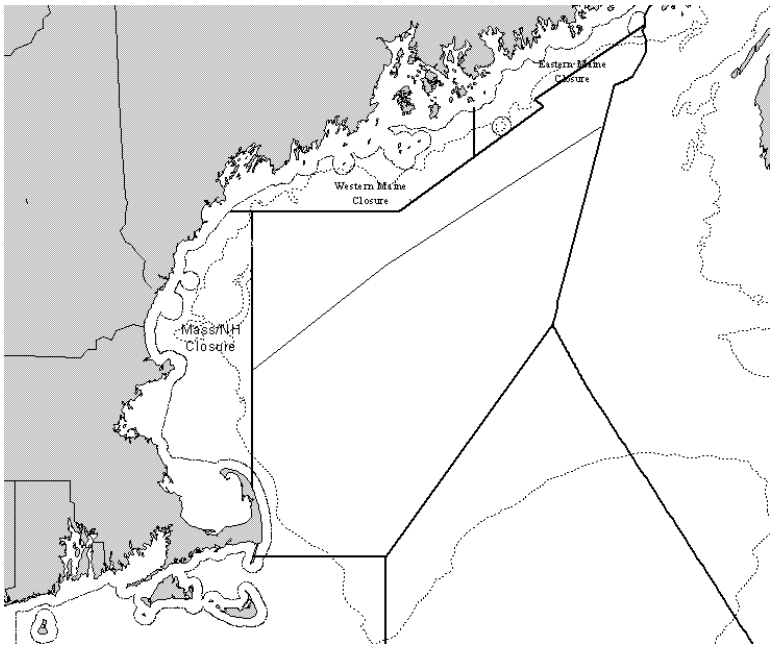


Figure 4. Management areas under Amendment 1.

Addendum I (2000) to Amendment 1 of the ASMFC Atlantic herring FMP was developed to re-address the protection of spawning areas because NMFS rejected the NEFMC's proposed Area 1A spawning closures in federal waters (see above). Under Addendum I, three spawning management areas were created (Figure 5) – Eastern Gulf of Maine (EGOM), Western Gulf of Maine (WGOM), and Massachusetts/New Hampshire (MA/NH), all of which are in Management Area 1A. These spawning areas extended into federal waters and had distinct start dates of August 15 (EGOM), September 1 (WGOM), and September 21 (MA/NH). Closures lasted 4 weeks by default, but would be extended 2 weeks if commercial catch sampling found that 25% or more mature herring, by number, had yet to spawn. Mature or "spawn" herring were defined as Atlantic herring in ICNAF gonadal stages V & VI. The definition remained "ICNAF gonadal stages V & VI" in all subsequent management documents.

In 2000, members of the public, herring fishermen, and Maine Department of Marine Fisheries personnel all noted a significant take of spawn herring from the area just outside the EGOM area during the closure. Consequently, Technical Addendum 1A (2001) was created to expand the EGOM spawning area to protect spawning females inside the eastern tip of Inner Schoodic Ridge (Figure 6).



Fi[illegible] 1.

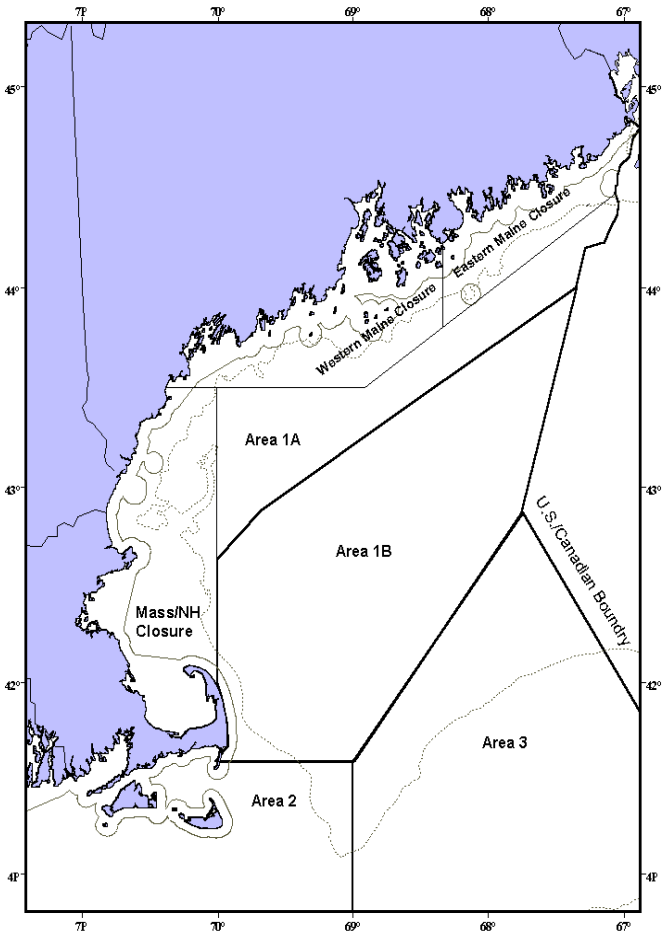


Figure 6. Spawning closure boundaries under Technical Addendum 1A to Amendment 1.

Today, ASMFC spawning regulations are specified through Amendment 2 and Technical Addendum I (2006), which continue with the three spawning areas and default dates established by Addendum 1 and Technical Addendum 1A (Figure 6). Spawning closures begin on the default start date unless commercial catch samples (see Section 2.2 of this document for more information) show significant amounts of spawn herring, defined as 25% or more in ICNAF gonadal stages V & VI. By default, closures last 4 weeks, at which point fishing is allowed. If a significant amount of spawn herring are found in the commercial catch samples after the closure, an additional 2 week closure is triggered. Fishermen are notified of the additional closure by the states, which use a distribution list that includes the ASMFC. The ASFMC will then place notice of the closure on their website.

Amendment 2 contains a "zero tolerance" provision that prohibits vessels from fishing for, taking, landing, or possessing "spawn" herring (ICNAF gonadal stages V & VI) in a spawning area during a closure. Some states interpreted zero tolerance to allow fishing in a closed area as long as no spawn herring are caught. Upon review of the loose interpretation of zero tolerance, and based on input from the Atlantic Herring Law Enforcement Committee (LEC), ASMFC developed Technical Addendum I to Amendment 2 to clarify that vessels are prohibited from fishing for, taking, or possessing herring within a restricted spawning area. The LEC was concerned that tolerances are difficult to enforce while prohibiting fishing in a closed area is easily enforceable.

Vessels on non-directed herring trips are allowed an incidental catch of 2,000 pounds from a restricted spawning area as a bycatch allowance. Any herring vessel that has more than 2,000 pounds of herring onboard that were caught outside an area under a spawning closure must have all of its fishing gear stowed as it travels through the closure area. Fixed gear fishermen east of Cutler, ME, are exempt from spawning closures and are not limited to the 2,000 pound bycatch allowance.

Amendment 2 does not include spawning restrictions for any offshore areas, although enforcement is by possession, not location of fishing. Its measures are designed to protect the inshore component of the stock by moving effort to offshore areas where the total allowable catch was historically not fully harvested. *Section 4.3.2 Spawning Restrictions* states that "protection to the offshore spawning component would come at the expense of putting more pressure on the inshore component of the stock complex."

2.0 AVAILABLE DATA ON HERRING SPAWNING ACTIVITY IN AREA 3

2.1 NMFS

The NMFS Northeast Fisheries Science Center (NEFSC) acoustic survey of the offshore component of the Atlantic herring population began in earnest in 1999 after about four years of initial pilot work. The survey covers the northern edge of Georges Bank and Great South Channel from the 'northeast peak' to Cape Cod and was designed to sample aggregations of herring as they prepared to spawn in the fall (Figure 7). Initially, the index of abundance was near historical highs, but beginning in 2002, the index of abundance from the acoustic survey declined approximately four-fold and remained relatively low through 2008 (Figure 8). This decline and low-level index, however, may not have reflected the true changes in abundance. The fundamental assumption of the acoustic survey is that the herring are congregating to spawn in and during the survey area and period. Atlantic herring spawning times and locations may have changed, but the survey area and timing remained relatively stable among years. If this is the case, the acoustic survey may not be achieving adequate spatial and temporal coverage. For this reason, the acoustic survey was not used in fitting recent Atlantic herring stock assessments (Shepherd et al. 2009).

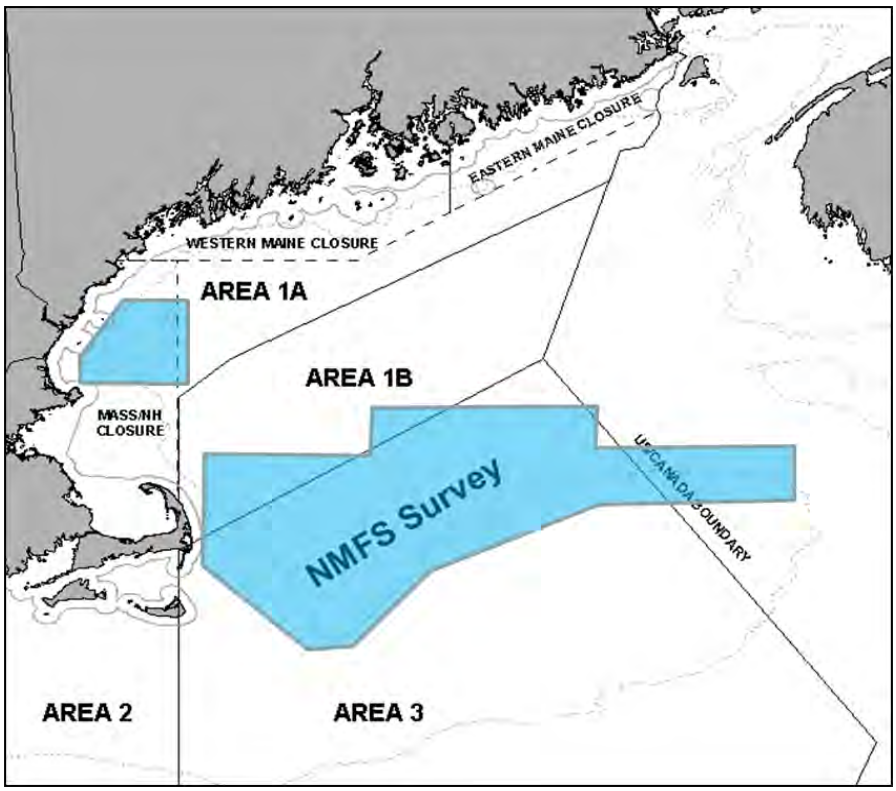


Figure 7. Survey areas of the Atlantic herring acoustic survey. Surveys on Georges Bank and Jeffreys Ledge have been completed every year since 1999.

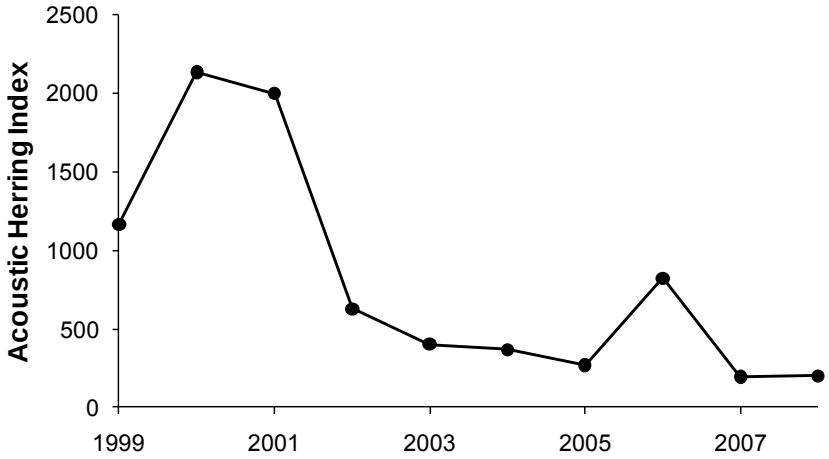


Figure 8. Atlantic herring acoustic index of abundance on George's Bank during 1999-2008.

Several research projects are being conducted to address potential issues with the acoustic survey. Acoustic data have been collected during the annual fall bottom trawl surveys, but these data have never been analyzed to determine if a supplementary acoustic index of herring abundance could be developed. A technician has begun processing the data, but limited funds have prevented the completion of this work. This research will resume as funds become available. Once complete, this project will provide a basis of comparison for the herring acoustic survey, and may serve as an additional index of abundance. Other biological data collected during the annual fall bottom trawl surveys may also be useful for evaluating temporal and spatial shifts in the occurrence of spawning herring. For example, comparing the proportion of herring at different stages of spawning among years and sampling stations may provide insight as to whether systematic changes have occurred in the spatial and temporal distribution of spawning events. This analysis will allow for the determination of whether the herring acoustic survey has adequately sampled over the course of any systematic changes in spawning events. A technician is in the process of conducting this and other analyses of biological data collected during the fall bottom trawl surveys.

A distribution of herring spawning time is calculated during the estimation of the annual NMFS NEFSC larval herring index. Combined with a numerical circulation model that will allow herring larvae to be tracked from sampling location backwards to hatch location, temporal and spatial patterns in herring spawning may be generated. These patterns could then be compared to the time and location of the acoustic survey in each year and a correction factor could be developed to adjust for any mismatches between the spawning patterns as derived from the larval index and the acoustic survey. A proposal based on this research has been submitted to the Fisheries and the Environment program and the project will be conducted by a team of scientists from NMFS NEFSC and Woods Hole Oceanographic Institute.

In addition to the formal research projects described above, NMFS is continually collaborating with other institutes to improve sampling capabilities. On-going collaborative projects include research and development of wide-band echo sounders and sonar systems that span spatial scales of sub-meters to thousands of square kilometers.

In recent years, the herring acoustic survey has been conducted during approximately the same 2-4 week period and the timing and spatial coverage of the survey was not informed by any information about the occurrence of spawning herring. The sampling design of the acoustic herring survey might be improved by using data, such as the biological and acoustic data collected during bottom trawl surveys, to inform the spatial and temporal coverage of the acoustic survey in each year. The details of how such a program might work are yet to be evaluated and will require additional research.

The biggest challenge facing the herring acoustic survey, and the completion of research related to the survey, is finding funds and people to process data and conduct the research. In particular, preparing the acoustic data for use requires a large time commitment, as does conducting much of the research described above. Temporary technicians have been available to conduct some of the analysis, but these positions are often short-term and create a discontinuity in personnel and expertise.

2.2 Maine Department of Marine Resources

Commercial catch samples are taken as part of ME DMR's portside sampling program for the herring fishery. These samples are used to develop the catch-at-age matrix for the Atlantic herring stock assessment and provide other important biological information, including information about the spawning condition of the fish. The portside sampling program randomly samples 50 fish from landed catches of directed herring trips, and both fresh and frozen samples are taken. When trips are being monitored for spawning status, 100 random fish are sampled from each trip, and the focus is on utilizing fresh fish. Once sampled, the fish are transported back to the lab and immediately processed for length, weight, age, sex, gonad weight, maturity stage, gut fullness, and gut weight. Even during the spawning season most fish being transported from Georges Bank are frozen, as the long trip would degrade the quality of the fish. Fish that have been frozen are unlikely to produce accurate results when put through the same sampling process described above, and the GSI and staging results are thought to be compromised. Once recorded this data is entered into the DMR relational database where the record of catch, effort, and sampling for each individual fish can be queried. The database serves two primary functions; for GSI determination of inshore GOM closures and use for catch-at-age models. It is also used for other various purposes such as determining the average ratio of males to females, average growth over seasons, the weight of female, inshore fish, and many others.

The DMR database was queried for reported landings from Management Area 3 (Georges Bank) in September, October, or November between 2000 and 2009. Number of trips that were sampled during these months and years are shown in Table 1. A total of 106 trips are available to examine spawner characteristics on Georges Bank.

Year	Sep	Oct	Nov	Total
2000	9	2		11
2001	17	10	2	29
2002	5	3		8
2003	5	4		9
2004	3			3
2005	4	1	1	6
2006	9	10	1	20
2007			1	1
2008		7		7
2009	8	4		12
Total	60	41	5	106

Table 1. Number of directed herring fishing trips with portside samples collected for examination of herring spawner characteristics in Management Area 3 (Georges Bank).

2.3 Vessel Monitoring System (VMS) Data

Data on the fishing patterns of directed herring trips are available through VMS data. These data, if accessible, would provide highly resolved spatial and temporal data on fishing patterns in Management Area 3 during fall. Such data could be used to evaluate potential lost fishing opportunities or shifts in fishing effort if spawning closure(s) were implemented on Georges Bank.

3.0 REFERENCES

Overholtz, W.J., L.D. Jacobson, G.D. Melvin, M. Cieri, M. Power, D. Libby, and K. Clark. 2004. Stock assessment of the Gulf of Maine - Georges Bank Atlantic herring complex, 2003. *Northeast Fish. Sci. Cent. Ref. Doc.* 04-06; 290 p. Available from: National Marine Fisheries Service, 166 Water St., Woods Hole, MA 02543.

Shepherd, G., M. Cieri, and W. Overholtz. 2009. Transboundary Resources Assessment Committee Gulf of Maine/George's Bank Atlantic herring stock assessment update. Transboundary Resources Assessment Committee Reference Document 2009/04.

Addendum to

Discussion Paper:

Summary of Available Information and Management Approaches to Address Spawning Atlantic Herring

March 2011

1.0 AVAILABLE DATA ON HERRING SPAWNING ACTIVITY

1.1 Massachusetts Division of Marine Fisheries (MA DMF)

Commercial Atlantic sea herring catch samples have been collected and processed by the Fisheries Dependent Investigations project. Through dock-side and at-sea monitoring, this program collects information to document the state's commercial fisheries performance and support stock assessment research. Because the current Atlantic sea herring management strategy has required GSI monitoring in the inshore spawning areas (e.g. MA/NH spawning area, Mid-coast ME), MA DMF's focus has been to collect information from these areas. As a result of this allocation of effort, the number of GSI samples for the offshore spawning areas is not as robust. Since 1999 through 2010 18 GSI samples have been collected and processed. Sample processing has been consistent with methods used by the state of ME and as defined by the ASMFC Atlantic herring FMP.

Beginning in October 2010 MA DMF initiated the River Herring Bycatch Avoidance study with the partners of Massachusetts University/SMAST and the Sustainable Fisheries Coalition. This study, grant funded by the National Fish and Wildlife Foundation, will provide information to the mid-water small pelagic fishing fleet on the locations of higher abundance of river herring so that they can be avoided during commercial fishing activities. To accomplish this, MA DMF will be increasing port sampling to cover 50% of all trips landed in Massachusetts. Although not a direct objective of the study, this will allow MA DMF opportunity to increase the number of offshore GSI samples obtained for GSI sampling and significantly enhance the number of samples that are currently being processed.

Appendix IX

Amendment 5 Written Comments



New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. "Rip" Cunningham, Jr., *Chairman* | Paul J. Howard, *Executive Director*

Written Comments received for Draft Amendment 5 the Herring FMP

These are comments received during the Council public comment period ending April 9, 2012

Herring Advisory Panel Mtg. May 30, 2012

From: Earthiustice <action@earthjustice.org> on behalf of M McGillivary

Sent: Monday, March 19, 2012 7:28 PM
To: comments
Subject: Comments on Draft Amendment 5

UPDATED AS OF 4/23/12
Example of 3047 Batch
Emails Rec'd to date

Mar 19, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem. Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns.

I am especially concerned about populations of river herring, which have declined by 99 percent and are so depleted that they are being considered for protection under the Endangered Species Act.

Most Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch in the industrial fishery targeting a different species, Atlantic herring.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet. I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all mid-water trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,

M McGillivary

Eugene, OR 97401

From: NRDC <nrdcinfo@nrdconline.org> on behalf of Nina Gimond
Sent: Wednesday, March 28, 2012 3:34 AM
To: comments
Subject: Comments on Draft Amendment 5 - Reform Atlantic herring industrial fishing

Example of 585 Batch
Emails Rec'd to date

Mar 28, 2012

Captain Paul Howard
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard,

I urge the New England Fishery Management Council to reform regulation of the Atlantic herring fishing industry. Unmanaged catch of river herring by industrial trawlers has contributed to a collapse of populations of these small but ecologically important fish. With river herring catch levels down 99 percent since 1970, most states have banned their harvest and the National Marine Fisheries Service is considering listing river herring under the Endangered Species Act. Yet Atlantic herring trawlers can catch millions of river herring every year without restriction or even adequate monitoring. This is unacceptable.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

** a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap)
** 100 percent at-sea monitoring on all mid-water trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2)
** an accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D)
** a ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5)
** a requirement to accurately weigh and report all catch (Section 3.1.5 Option 2)

Every year, states and communities throughout New England and elsewhere on the east coast invest significant time and resources to restore their herring runs. Fishermen in inland and state coastal waters can no longer catch river herring, and instead must bide time and hope for populations to rebound. The New England Fishery Management Council must do its part and step forward to adequately regulate the Atlantic herring fishing fleet.

Sincerely,

Ms. Nina Gimond
57 Francis St
Waterville, ME 04901-5226

Example of 759 Batch
Emails Rec'd to date

PEW ENVIRONMENTAL GROUP
NE FISHERIES PROGRAM

Alicia LaPorte
1621 1st St NW
1
Washington, DC 20001-1101

Mar 8, 2012

Paul Howard
New England Fishery Management Council

Subject: Re: Atlantic Herring Fishery Management Plan

Dear Paul Howard,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring. Populations of these fish have declined by 99 percent and are so depleted they are being considered for protection under the Endangered Species Act.

Most Atlantic states now prohibit the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch by industrial herring ships.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. Many tireless citizens carefully shepherd migrating river herring past in-river obstacles by hand. The council must support, not undermine, these efforts.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch reduction program that incorporates the following management actions:

* Immediate implementation of a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage or dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

City and State of those 759 commenting, taken from the summary given by PEW Environmental

City	State	City	State	City	State	City	State
Stevenson	AL	Richmond	CA	Bakersfield	CA	Santa Cruz	CA
Pleasant Grove	AL	Los Angeles	CA	Santa Barbara	CA	Los Angeles	CA
Jacksonville	AL	Fresno	CA	Sacramento	CA	Saugus	CA
North Little Rock	AR	Alamo	CA	Cupertino	CA	Santa Cruz	CA
Haskell	AR	San Lorenzo	CA	Kirkwood	CA	San Luis Obispo	CA
Cabot	AR	Foster City	CA	Walnut Creek	CA	Lodi	CA
Tonopah	AZ	Albany	CA	escondido	CA	Davis	CA
orovalley	AZ	Venice	CA	Palm Springs	CA	Los Angeles	CA
Tucson	AZ	Hayward	CA	Simi Valley	CA	Fort Collins	CO
Tucson	AZ	Sherman Oaks	CA	Lake Elsinore	CA	Lakewood	CO
Tucson	AZ	Napa	CA	Palm Springs	CA	Denver	CO
Tucson	AZ	san diego	CA	Mill Valley	CA	Lakewood	CO
Cottonwood	AZ	San Jose	CA	Santee	CA	Northglenn	CO
Phoenix	AZ	Long Beach	CA	Berkeley	CA	Denver	CO
Tucson	AZ	Sacramento	CA	Napa	CA	Longmont	CO
Tucson	AZ	San Diego	CA	Folsom	CA	Pagosa Springs	CO
Tucson	AZ	San Diego	CA	Palmdale	CA	Golden	CO
scottsdale	AZ	Temecula	CA	San Mateo	CA	Carbondale	CO
Tucson	AZ	Piedmont	CA	Santa Rosa	CA	Denver	CO
Sun City	AZ	Los Angeles	CA	Vallejo	CA	Arvada	CO
Phoenix	AZ	Berkeley	CA	Ojai	CA	Louisville	CO
Auburn	CA	Costa Mesa	CA	Palm Springs	CA	Norwalk	CT
Montara	CA	Merced	CA	Studio City	CA	North Branford	CT
Hayward	CA	Menlo Park	CA	Malibu	CA	Fairfield	CT
Toluca Lake	CA	Albany	CA	Merced	CA	Bridgeport	CT
Sacramento	CA	San Francisco	CA	Tujunga	CA	Quinebaug	CT
W Hollywood	CA	Valley Village	CA	Anaheim	CA	Cromwell	CT
W Hollywood	CA	Los Angeles	CA	Santa Cruz	CA	Pawcatuck	CT
Agoura	CA	San Francisco	CA	Stockton	CA	Storrs Mansfield	CT
Novato	CA	San Francisco	CA	San Francisco	CA	Meriden	CT
Applegate	CA	San Francisco	CA	Los Angeles	CA	Madison	CT
Los Gatos	CA	Van Nuys	CA	Lancaster	CA	East Canaan	CT
West Hills	CA	Oakland	CA	Los Angeles	CA	Berlin	CT
Escondido	CA	Los Angeles	CA	La Jolla	CA	Windham	CT
San Diego	CA	Camarillo	CA	Glendale	CA	New Haven	CT
Mount Shasta	CA	Fresno	CA	Saint Helena	CA	Stamford	CT
Fort Bragg	CA	Glendale	CA	Laguna Niguel	CA	Milford	CT
Murrieta	CA	Long Beach	CA	San Marcos	CA	Norwalk	CT
San Jose	CA	Pacific Palisades	CA	Fountain Valley	CA	Enfield	CT
La Jolla	CA	Fountain Valley	CA	Orange	CA	Mansfield Center	CT
Riverbank	CA	Aliso Viejo	CA	Hesperia	CA	Shelton	CT
Sacramento	CA	Laguna Niguel	CA	Santa Monica	CA	Meriden	CT
Hollywood	CA	Ventura	CA	Point Reyes Station	CA	Stratford	CT
Los Angeles	CA	San Francisco	CA	Riverside	CA	West Hartford	CT

Lake Elsinore	CA	Rancho Palos Verd	CA			New Haven	CT
Los Angeles	CA					Storrs	CT
Tolland	CT	Tampa	FL	Alsip	IL	Middleboro	MA
Trumbull	CT	Boca Raton	FL	Highland Park	IL	Clinton	MA
Avon	CT	Boca Raton	FL	Westmont	IL	Northfield	MA
South Glastonbury	CT	Orlando	FL	Chicago	IL	Harvard	MA
Stratford	CT	Jacksonville	FL	Chicago	IL	Arlington	MA
New London	CT	Atlantic Beach	FL	Chicago	IL	Marshfield	MA
Stamford	CT	Atlantic Beach	FL	Oak Park	IL	Dracut	MA
Milford	CT	Jacksonville	FL	Chicago	IL	Lancaster	MA
Washington	DC	Jacksonville	FL	Arlington Heights	IL	New Bedford	MA
Washington	DC	Tampa	FL	Chicago	IL	Wakefield	MA
Washington	DC	Tampa	FL	Hoffman Estates	IL	Melrose	MA
Washington	DC	Tampa	FL	Highland Park	IL	Florida	MA
Middletown	DE	Fort Myers	FL	New Douglas	IL	Wellfleet	MA
Newark	DE	Lake Mary	FL	Glen Ellyn	IL	Cambridge	MA
Lantana	FL	Smyrna	GA	Chicago	IL	Cambridge	MA
Atlantic Beach	FL	Decatur	GA	Palatine	IL	South Dennis	MA
Orlando	FL	Atlanta	GA	Lake IN The Hills	IL	Sandwich	MA
Punta Gorda	FL	Douglasville	GA	Midlothian	IL	Duxbury	MA
Cooper City	FL	Smyrna	GA	rensselaer	IN	Arlington	MA
Cocoa Beach	FL	Temple	GA	cc	IN	cohasset	MA
Miami	FL	Atlanta	GA	Fort Wayne	IN	Woods Hole	MA
Lady Lake	FL	Arnoldsville	GA	Bloomington	IN	Boston	MA
Melbourne	FL	Athens	GA	Fort Wayne	IN	North Adams	MA
St Petersburg	FL	Kailua	HI	Munster	IN	Gilbertville	MA
Apopka	FL	Lihue	HI	Newburgh	IN	Cambridge	MA
Saint Cloud	FL	Kailua	HI	Merrillville	IN	Aquinnah	MA
Port St Lucie	FL	Evansdale	IA	Manhattan	KS	Braintree	MA
miami	FL	Ames	IA	Topeka	KS	Newburyport	MA
Venice	FL	Keokuk	IA	Lawrence	KS	Plymouth	MA
Tampa	FL	Cedar Falls	IA	Frankfort	KY	Watertown	MA
Jacksonville	FL	Windsor Heights	IA	Baton Rouge	LA	Cambridge	MA
Spring Hill	FL	Iowa City	IA	River Ridge	LA	Stoneham	MA
St Petersburg	FL	Boise	ID	Duxbury	MA	Brookline	MA
Saint Petersburg	FL	New Plymouth	ID	Duxbury	MA	Cambridge	MA
Winter Garden	FL	Lewiston	ID	Ipswich	MA	Boston	MA
Venice	FL	Meridian	ID	West Tisbury	MA	North Falmouth	MA
North Port	FL	Hailey	ID	Salem	MA	Stoneham	MA
Bradenton	FL	Villa Park	IL	Concord	MA	Somerville	MA
Sanibel	FL	Elgin	IL	Somerville	MA	Winthrop	MA
Jacksonville	FL	Naperville	IL	Cambridge	MA	West Dennis	MA
Big Pine Key	FL	Chicago	IL	Boxford	MA	Westwood	MA
Cocoa Beach	FL	Mchenry	IL	Gardner	MA	New Bedford	MA
Longwood	FL	Chicago	IL	Edgartown	MA	Framingham	MA
St Petersburg	FL	Chicago	IL	Acton	MA	Pembroke	MA

Lauderhill	FL	Wilmette	IL	Cotuit	MA	Southwick	MA
Quincy	MA	Falmouth	MA	Kansas City	MO	Trenton	NJ
Amherst	MA	Cockeysville	MD	Florissant	MO	Morristown	NJ
Somerville	MA	Greenbelt	MD	Kansas City	MO	Ocean	NJ
Mendon	MA	Greenbelt	MD	Wildwood	MO	Old Bridge	NJ
Natick	MA	Hagerstown	MD	Saint Louis	MO	Weehawken	NJ
Arlington	MA	La Plata	MD	Kansas City	MO	Iselin	NJ
Worcester	MA	Buckeystown	MD	Kansas City	MO	Jersey City	NJ
Wellfleet	MA	Glen Burnie	MD	Saint Louis	MO	Carteret	NJ
Quincy	MA	Bethesda	MD	Laurel	MS	Hewitt	NJ
Framingham	MA	South Portland	ME	Jackson	MS	Montclair	NJ
Duxbury	MA	York Harbor	ME	Charlotte	NC	Williamstown	NJ
Springfield	MA	York	ME	Concord	NC	Barnegat	NJ
Haydenville	MA	Yarmouth	ME	Halifax	NC	Califon	NJ
Boston	MA	Harmony	ME	Wilmington	NC	Morganville	NJ
Upton	MA	Scarborough	ME	Asheville	NC	Bridgewater	NJ
Ayer	MA	Sanford	ME	Lenoir	NC	Santa Fe	NM
Cambridge	MA	Portland	ME	Hampstead	NC	Albuquerque	NM
Somerville	MA	Freeport	ME	Morganton	NC	Albuquerque	NM
Sheffield	MA	Lincolnville	ME	Arden	NC	Santa Fe	NM
Tewksbury	MA	Waterford	ME	Lexington	NC	Capitan	NM
Holliston	MA	Camden	ME	Beulah	ND	Barcelona, Spain	None
Norwood	MA	Limington	ME	Lincoln	NE	Reno	NV
Framingham	MA	Troy	ME	Papillion	NE	Las Vegas	NV
Quincy	MA	Lewiston	ME	Lincoln	NE	Brooklyn	NY
Jamaica Plain	MA	E. Machias	ME	Exeter	NH	New York	NY
West Falmouth	MA	Hancock	ME	Newton	NH	New York	NY
Quincy	MA	Northville	MI	Hollis	NH	Mahopac	NY
Burlington	MA	Lansing	MI	Alstead	NH	Peekskill	NY
Charlestown	MA	Sterling Heights	MI	Milton	NH	Port Washington	NY
Somerville	MA	Westland	MI	Durham	NH	Saugerties	NY
Boston	MA	Lansing	MI	Newport	NH	Kenmore	NY
Marshfield	MA	Ypsilanti	MI	Londonderry	NH	New York	NY
Boston	MA	Ypsilanti	MI	Exeter	NH	Goshen	NY
Cambridge	MA	Grand Junction	MI	Newtonville	NJ	Schenectady	NY
Colrain	MA	Bloomfield Hills	MI	Newtonville	NJ	Middletown	NY
Aquinnah	MA	Belleville	MI	Jersey City	NJ	Selden	NY
Aquinnah	MA	Belleville	MI	Hammonton	NJ	New York	NY
Duxbury	MA	Minneapolis	MN	Cherry Hill	NJ	Brooklyn	NY
Boxford	MA	Chisago City	MN	Madison	NJ	Mount Sinai	NY
Plainville	MA	Nevis	MN	Garfield	NJ	New Rochelle	NY
Amherst	MA	Hutchinson	MN	Warren	NJ	High Falls	NY
Swampscott	MA	White Bear Lake	MN	Collingswood	NJ	New York	NY
Cambridge	MA	Maple Grove	MN	Bloomingdale	NJ	New York	NY
Peabody	MA	Madelia	MN	Princeton Junction	NJ	New York	NY

Winchester	MA	Moorhead	MN	Milford	NJ	Brooklyn	NY
Montauk	NY	New York	NY	Williamsport	PA	Richardson	TX
Syracuse	NY	Massapequa Park	NY	Canonsburg	PA	Plano	TX
Binghamton	NY	New Rochelle	NY	Hellertown	PA	Austin	TX
New York	NY	Gloversville	NY	trevose	PA	Keller	TX
Troy	NY	Gloversville	NY	Philadelphia	PA	Austin	TX
Ossining	NY	Brooklyn	NY	Philadelphia	PA	Houston	TX
Schenectady	NY	Manlius	NY	Philadelphia	PA	Austin	TX
Sag Harbor	NY	Ithaca	NY	West Chester	PA	Highland Village	TX
Rochester	NY	Rock Creek	OH	Horsham	PA	Arlington	TX
White Plains	NY	Union	OH	Greensburg	PA	San Antonio	TX
New York	NY	Cincinnati	OH	Hatfield	PA	Corpus Christi	TX
Massapequa	NY	Westerville	OH	Lancaster	PA	San Antonio	TX
New York	NY	Gambier	OH	Exeter	PA	Austin	TX
Cambridge	NY	Columbus	OH	Feasterville Trevose	PA	Austin	TX
Staten Island	NY	Akron	OH	York	PA	Stephenville	TX
Buffalo	NY	Ashley	OH	Feasterville Trevose	PA	San Antonio	TX
New York	NY	Cleveland	OH	Lansdale	PA	Denton	TX
New York	NY	Mayfield Hts	OH	Pittsburgh	PA	Katy	TX
New York	NY	Vienna	OH	Pittsburgh	PA	Houston	TX
Middletown	NY	Warren	OH	Selinsgrove	PA	Denton	TX
New York	NY	Clinton	OK	Philadelphia	PA	San Antonio	TX
Brooklyn	NY	Oklahoma City	OK	Cayey	PR	Houston	TX
Peekskill	NY	Stillwater	OK	Arecibo	PR	Austin	TX
Medford	NY	Broken Arrow	OK	Newport	RI	Coppell	TX
Hamilton	NY	Eugene	OR	Warwick	RI	Austin	TX
New York	NY	Klamath Falls	OR	Coventry	RI	Smithville	TX
Brooklyn	NY	Pendleton	OR	Chepachet	RI	Richardson	TX
New York	NY	Portland	OR	Barrington	RI	Dallas	TX
West Haverstraw	NY	Ashland	OR	Riverside	RI	Baytown	TX
New York	NY	Portland	OR	Warwick	RI	Layton	UT
New York	NY	Eugene	OR	North Providence	RI	Salt Lake City	UT
Port Jervis	NY	Myrtle Creek	OR	Prudence Island	RI	Salt Lake City	UT
New York	NY	Corvallis	OR	Wakefield	RI	Salt Lake City	UT
Patterson	NY	Portland	OR	Aiken	SC	Salt Lake City	UT
brooklyn	NY	Philadelphia	PA	Beaufort	SC	Ogden	UT
Albany	NY	Lansdale	PA	Seabrook	SC	Virginia Beach	VA
Brooklyn	NY	Philadelphia	PA	Clemson	SC	Richmond	VA
Corning	NY	Lancaster	PA	Memphis	TN	Burke	VA
New York	NY	New Castle	PA	Murfreesboro	TN	Arlington	VA
Brooklyn	NY	sellersville	PA	Franklin	TN	Ruther Glen	VA
ny	NY	Bethel Park	PA	Nashville	TN	Richmond	VA
Whitestone	NY	Broomall	PA	Memphis	TN	Roanoke	VA
Rego Park	NY	Canonsburg	PA	Nashville	TN	Arlington	VA
Montauk	NY	Munhall	PA	Bon Aqua	TN	Glen Allen	VA

Jamaica	NY	Philadelphia	PA	Nashville	TN	Lynchburg	VA

North Chesterfield	VA
Yorktown	VA
Broadlands	VA
Hinesburg	VT
Bristol	VT
Weston	VT
White River Junctio	VT
Marshfield	VT
Seattle	WA
Clinton	WA
Seattle	WA
Seattle	WA
Vancouver	WA
Seattle	WA
Bellingham	WA
Renton	WA
Seattle	WA
Issaquah	WA
Clarkston	WA
Seattle	WA
Seattle	WA
Spokane	WA
Des Moines	WA
Buckley	WA
Milwaukee	WI
Mondovi	WI
Oshkosh	WI
Madison	WI
Waupaca	WI
Ripon	WI
Fitchburg	WI
Madison	WI
Madison	WI
Milwaukee	WI
Waukesha	WI
Madison	WI
Mannington	WV

(5)

RECEIVED
FEB 24 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

February 22, 2012

Respected members of the herring committee and council,

Thank you for this opportunity to comment on herring amendment 5, I would like to start by addressing ground fish closed areas they are very important not only to myself, but many other ground fishermen from Maine. I believe there needs to be protection for the herring from all fishing in these selected spawning and habitat closures. I think fish should have a place to reproduce undisturbed by human activity, this should bring back natural spawning behavior. If there is some fishing allowed in the closed areas there should be rules that don't allow any contact with the bottom so that spawning isn't disturbed. For example, if mid-water trawlers are allowed then we need to define what is mid-water with the use of bottom sensors to determine how far off bottom they are fishing. This should be part of the reporting of fishing activity, with 100% at sea observers on board.

That brings me to another part of this amendment. Monitoring, there is a need for 100% observers though out this fishery. This could be though the certified NMFS observer program or EMS electronic monitoring system which would lower cost for the industry. I think that if we are going to protect herring for lobster bait and forage for ground fish we shouldn't have anything less than the highest percentage of coverage this fishery.

This brings us to another part of the amendment, vessel class. This is controversial, the A/B class catches about 97% of the whole stock and without question they need to be monitored for catch and by-catch, if we add the C class vessels this makes the catch totals for all three A B C classes at 99% of the fishery. The class D vessels are about 1% of the total fishery. I think that it would save costs to the lower classes vessels; C/D classes that are smaller boats and a very small part of this fishery. If they are allowed to be exempted from the monitoring there would be a very low impact on the herring stock overall and would allow them to be active in this and other fisheries. If they were allowed this exception they would need to report their catch daily or the day the trip is landed though the EVTR program, also there could be a consideration of EMS on board if the council believes it is needed. As far as the D class vessels are concerned while fishing for groundfish or tuna there is no need for a herring observer on these trips due to their low interaction with herring.

The next subject I would like to address is something that is happing in other fisheries as well as herring. There is the crossing of stock boundaries during a tow or set, this can determine which stock area the fish is taken from, for example if a tow for herring is set in area 1B and hauled in area 3 the catch is deducted from area 3, this is problematic for tracking stock area quota. I think there shouldn't be any boundary crossing of stock areas in any fishery, if a tow is set in 1B it should be hauled in 1B.

Also a concern to me is the issue of dumping; in the amendment under closed area 1 rules I would suggest that option 4a - 4b be taken out of the document and to consider using 4c or 4d because I think they address what CA1 was meant to represent. I also think that if on a trip for herring if a high rate of slipped or dumped tows are encountered there needs to be a limit on dumping. I don't know what the

cc: LS (2/24), Council

best scientific number would be, but somewhere around 10 seems fair. The reason I think 10 is fair is that if there are 10 dumps those would be counterproductive tows. If I were fishing on these trips I would think it would be time to go in and regroup.

In closing, I would like to state again the need to monitor this fishery for catch and by-catch for all of our fisheries health and the need to protect our spawning areas for the communities and their fishing future. As an example, a steady supply of lobster bait for now and the future and the need for forage fish in groundfish, tuna, striped bass and the blue fish fisheries to name a few.

Thank you sincerely,



Captain Gary Libby

F/V Leslie & Jessica

Joan O'Leary

From: Philip Buzby <philip.buzby@gmail.com>
Sent: Wednesday, March 14, 2012 7:11 AM
To: comments
Subject: Regulate the Industrial Mid Water Trawl Fleet: Comments on Draft Amendment 5

Dear Sirs,

I am a recreational fisherman mainly fishing from my own boat throughout the saltwater coast of Massachusetts wherein I target a wide variety of game fish species. Critical to the sustainable populations of fish are both the availability of bait fish plus regulation & oversight of the mid water trawl fleet. The indiscriminate and mostly unmonitored catch (target species and by-catch) by these huge vessels, some times working in pairs, with nets that can span a mile are responsible for decimating the fish resources. I am in support of the recommendations put forth by the group Honest By Catch summarized below:

Critical Alternatives That Must Be Approved in Amendment 5:

NEFMC must approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. At minimum, the following actions must be approved:

• Honest By Catch supports Section 3.2.1.2 Alternative 2
100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life

• Honest By Catch supports Section 3.2.3.4 Alternative 4D
An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port

• Honest By Catch supports Section 3.4.4 Alternative 5
No herring mid water trawling in areas established to promote rebuilding of ground fish populations

• Honest By Catch supports Section 3.3.5, if modified to require immediate implementation of a river herring catch cap
An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery

• Honest By Catch supports Section 3.1.5 Option 2
A requirement to accurately weigh and report all catch is essential to any monitoring system

Additionally, something should be considered about changing the rules regulating the dogfish shark population. The massive numbers of these creatures currently widespread throughout the area are responsible for wiping out the young of the next generations of many game/ground fish, cod being the most notable in the news.

Sincerely,

Phil

--

Philip R Buzby
31 Harlan Drive
Brockton, MA
508-955-0070
e-mail: philip.buzby@gmail.com

Joan O'Leary

From: Earthjustice <action@earthjustice.org> on behalf of William Leavenworth <william.leavenworth@gmail.com>
Sent: Wednesday, March 14, 2012 9:13 AM
To: comments
Subject: Comments on Draft Amendment 5

Mar 14, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

To whom it may concern:
I have graphed the inshore and offshore catch numbers for alewives for Maine, New Hampshire and Massachusetts for the years from 1887 through 1960. The Massachusetts catch fluctuated within fairly consistent parameters at 5 million pounds or less per year until 1954, when Massachusetts offshore mackerel and sea herring seiners began to land much larger numbers of alewives as bycatch. Massachusetts' offshore alewife bycatch continued to grow until 1958, when offshore mackerel and herring seiners landed over 33 million pounds of alewives as bycatch. Massachusetts' inshore targeted alewife fishery declined to near zero over the same period. The offshore alewife bycatch continued in tens of millions of pounds but in declining totals until 1968, when both the inshore and offshore alewife catch collapsed to near zero.
Meanwhile, Maine's inshore targeted inshore alewife fishery continued to land between 1 million and 4.5 million pounds of alewives, with no appreciable addition from offshore seiners. This data tells me that 1) Maine and Massachusetts alewives derive from separate spawning stocks, and 2) offshore seiners and trawlers destroyed the Massachusetts alewife spawning stock, while their absence in Maine waters allowed Maine's alewife spawning stock to continue at sustainable levels.
All data is from the fisheries' own landings figures published in annual reports.

Sincerely,

William Leavenworth

Searsmont, ME 04973-0069

Joan O'Leary

From: Michael Behot <michael.behot@gmail.com>
Sent: Wednesday, March 14, 2012 8:57 AM
To: comments
Subject: Mid-Water Trawlers

Hello,

I am writing in reference to Amendment 5 Draft Environmental Impact Statement. River Herring and Shad have been over fished and the take needs to be cut back. These are the forage fish for many of the coastal and pelagic fish on the east coast and they must be protected for the purpose. The trawlers need to be better regulated and their take reduced. I fear if the current trend continues it will cripple the food chain for all species. Thank you for your time and consideration.

Michael S. Behot

Joan O'Leary

From: Andy Stevenson <andy@robertsonsgmc.com>
Sent: Wednesday, March 14, 2012 10:54 AM
To: comments
Subject: Comments on Draft Amendment 5

Attn: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

Hello Mr. Howard,
I am writing in support of the articles proposed regarding mid water trawling and the protection of river herring and other species. I personally believe trawling of any sorts is an unfair practice, decimating not only the "target" species but all others as well. I would like to see an outright ban on pair trawling and a ban on trawling all together. I don't foresee that ever happening, personally I find the commercial operations to be greedy and uncaring of their "bycatch" . I ask that you at least support the proposed bills to monitor and regulate the trawling industry in order to preserve and protect not only river herring and other species mentioned but also the marine life that relies on these fish in order to survive.

Thank you,

Andy Stevenson
Service Manager
(508) 291 0044 ext. 146
Robertson's GMC Truck
2680 Cranberry Highway
Wareham , MA 02571

Joan O'Leary

From: Earthjustice <action@earthjustice.org> on behalf of Marilyn Britton <mbrittons@comcast.net>
Sent: Wednesday, March 14, 2012 10:26 AM
To: comments
Subject: Comments on Draft Amendment 5

Mar 14, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

It is with great concern that I'm contacting you about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem.
Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns.

WITHOUT VERY SRINDGENT RULES AND THEIR ENFORCEMENT OF THE FISHING INDUSTRY WE WILL ALL SUFFER THE CONSEQUENCES. NOW IS THE TIME TO SEVERLY LIMIT CATCHES OR THAT TIME WILL COME SOONER THAN LATER.

I am especially concerned about populations of river herring, which have declined by 99 percent and are so depleted that they are being considered for protection under the Endangered Species Act.

Most Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, NO PROTECTIONS HAVE BEEN EXTENDED TO THESE FISH IN THE OPEN OCEAN, where they are taken by the millions as profitable bycatch in the industrial fishery targeting a different species, Atlantic herring.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet.

I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management
actions:

* A catch limit, or cap, on the total amount of river herring caught
in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all mid-water trawl fishing trips
in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or
dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to
promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section
3.1.5 Option 2).

Thank you for SERIOUSLY CONSIDERING MY COMMENTS and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,

Marilyn Britton

Peterborough, NH 03458-1811

Joan O'Leary

From: Rich <rcbuckley@verizon.net>
Sent: Wednesday, March 14, 2012 2:08 PM
To: comments
Subject: Draft Ammendment - Mid Water Trawl Fleet

Mr. Howard,

I support the efforts of "Honest Bycatch" in regulating the Mid Water Trawl Fleet.

• Honest By Catch supports Section 3.2.1.2 Alternative 2
100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life

• Honest By Catch supports Section 3.2.3.4 Alternative 4D
An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port

• Honest By Catch supports Section 3.4.4 Alternative 5
No herring mid water trawling in areas established to promote rebuilding of ground fish populations

• Honest By Catch supports Section 3.3.5, if modified to require immediate implementation of a river herring catch cap
An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery

• Honest By Catch supports Section 3.1.5 Option 2
A requirement to accurately weigh and report all catch is essential to any monitoring system

Thank you for allowing me to voice my concerns.

Richard C.Buckley
44 Maplewood Terrace
Braintree Ma

tel/781-843-7004

Joan O'Leary

From: Earthjustice <action@earthjustice.org> on behalf of jacob chachkes <jtc8@optonline.net>
Sent: Wednesday, March 14, 2012 6:47 PM
To: comments
Subject: Comments on Draft Amendment 5

Mar 14, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

When are you or ANYONE going to focus on the 'dead sea' accumulation of plastics int several areas of the globe?
Commercial fishing will be dead if the 'dead sea' areas are allowed to grow.
And STOP indiscriminate trawling that wastes too many important food chain fish.

Sincerely,

jacob chachkes

NEW CANAAN, CT 06840

Joan O'Leary

From: Earthjustice <action@earthjustice.org> on behalf of Laureen Elizabeth <laureene@hotmail.com>
Sent: Wednesday, March 14, 2012 11:32 PM
To: comments
Subject: Comments on Draft Amendment 5

Mar 14, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem.

I am especially concerned about populations of river herring, which have declined by 99 percent and are so depleted that they are being considered for protection under the Endangered Species Act.

Thank you for whatever you can do to improve management of the Atlantic herring fishery.

Sincerely,

Laureen Elizabeth

Clinton, CT 06413-1726

Joan O'Leary

From: don.palladino@comcast.net
Sent: Friday, March 16, 2012 10:15 AM
To: comments
Cc: jp wellfleet; bbrennes@wheatonma.edu; deborahfreeman1@comcast.net; rprescott@massaudubon.org; peasoupgraphics@comcast.net; jeff hughes; margofenn@gmail.com; beth chapman; j l riehl; don palladino; suffano@hotmail.com; wellflt@aol.com; dreelan102@verizon.net
Subject: River herring bycatch in the Atlantic herring fishery

We wish to congratulate the NEFMC for including provisions to address river herring bycatch in Draft Amendment 5 to the Atlantic Herring and Fishery Management Plan. These provisions are long overdue, and their approval and implementation cannot be further delayed. Those of us who monitor river herring runs and strive to restore our rivers, streams and estuaries, need assurance that bycatch will no longer contribute to the declines in river herring that we have observed over the past decade.

Concerning Alternatives to address observer coverage: we urge the Council to adopt a 100% observer coverage/ monitoring program for the entire Atlantic Herring Fleet. Such a monitoring program will benefit Atlantic herring as well as river herring populations, and provide necessary data for future management decisions.

The Friends of Herring River also support Alternative 3, suboption1: the establishment of "Safe Zones," temporal and geographical areas of closure to the Atlantic herring fishery. These zones based on Northeast Fisheries Observer Program (NEFOP) data from previous years. In addition, we urge for continued monitoring of the fishery for areas where river herring bycatch is encountered so that modifications to temporal protected areas can be based on the most recent and accurate data.

Although it will be difficult to establish reasonable catch limits for river herring bycatch, a conservative threshold limit must be immediately set, based on the 2012 river herring stock assessment, and all areas closed, without delay, once the limit is reached. A mechanism must be in place to bring all catch onboard fishing vessels so that accurate sampling can be done by the independent observers and allow accountability for any "dumping" of river herring that occurs at sea.

We believe that the measures which we support will be the most effective in reducing encounters with river herring by vessels in the directed Atlantic herring fishery and are optimistic that they will be adopted in Amendment 5.

Finally, we urge that alternative 1: No Action, be eliminated from consideration.

Donald J. Palladino
President
Friends of Herring River, Wellfleet/Truro

Joan O'Leary

From: jkc367@aol.com
Sent: Friday, March 16, 2012 10:59 AM.
To: comments
Subject: herring bicatch

Please add our voice to the efforts to stop the herring bi catch...This unnecessary fishery continues to affect so much more of the health of other fish ...I'm sure you agree with the science and will get this done.. Thanks John Connors and Kathleen Connors 260 old long pond rd, wellfleet, ma. 02667

Joan O'Leary

From: Ivan and Mimi Ace <imace@verizon.net>
Sent: Friday, March 16, 2012 10:48 AM
To: comments
Subject: Draft Amendment #5

Anything that can be done to halt the reduction of herring river stocks, and eventually lead to an increase in the population, should be done. The volunteers of Friends of Herring River (wellfleet, MA) will continue to monitor the spawning activity of alewives and blueback herring and report on the findings thru Association for the Preservation of Cape Cod.

Ivan Ace
Eastham

March 17, 2012

Paul J. Howard, Executive Director

New England Fishery Management Council

50 Water Street Mill #2

Newburyport MA 01950

RE: Comments on Draft Amendment 5

Dear Mr. Howard:

On behalf of the 131 members that comprise the Stellwagen Bank Charter Boat Association (SBCBA), we ask that you and the New England Fishery Management Council take action to reduce the by-catch, improve the monitoring system, and impose more effective effort controls over the Atlantic Herring Fishery.

We believe the noticeable decline in herring stocks is largely attributed to midwater trawl vessels, both single and paired. We ask that NEFMC help address the declining herring stocks by adopting the following proposed alternatives as specified in the Draft Amendment 5:

Section 3.1.5 Option 2 Require Dealers to Accurately Weigh All Fish

Section 3.2.1.2 Alternative 2 Require 100% Observer Coverage on Limited Access Herring Vessels

Section 3.2.3.4 Alternative 4D Closed Area I Provision with Trip Termination Only (5 events)

Section 3.3.5 if modified, impose cap on the total amount of river herring landed in the Atlantic herring fishery

Section 3.4.4 Alternative 5 Closed Areas – prohibit midwater trawl fishing in year-round closed areas

Thank you for both your consideration and time.

Respectfully Yours,

Steven James

President, SBCBA

Joan O'Leary

From: Randy Sigler <Randy@Striper.com>
Sent: Saturday, March 17, 2012 3:35 PM
To: comments
Subject: Comments on Draft Amendment 5

Dear Mr. Howard,

My name is Randy Sigler, and I am writing to submit comment on the Draft Amendment 5 of the Herring mgt plan.

As some background, I run a very busy guide service out of Marblehead, MA. I also fish commercially for striped bass and groundfish in Massachusetts waters, as well as Bluefin tuna in State and Federal waters. Finally, I am also a MA licensed seafood dealer and run a fairly large CSF-type direct to consumer distribution program.

In my guide service, we fish from May into November. The majority of our trips target striped bass, but we also do a significant number of offshore cod and tuna trips. From June through August, we typically run 3 or 4 boats, morning and afternoon, 6-7 days a week. It is quite busy.

From guiding, to commercial fishing, to seafood distribution, our business fingers reach out and touch a great number of individuals and businesses. I am sure that you are quite familiar with the economics of all of these business endeavors. A wonderful component of these economics is that there is a significant amount of "local" spending. Monies that are spent locally (to and from our businesses) tend to stay local to be spent locally again.

As you can imagine, I am very concerned about the health of the Atlantic Herring population, as it forms much of the forage stock for the fisheries that all of my businesses are dependant upon.

It is my belief that fisheries are an industry unlike any other, in that for there to be a long term viability of a fishery, there has to be an inherent "inefficiency" built into the industry. I often cite the example of the New England lobster fishery. This fishery has survived for so long, and is relatively healthy today primarily because the fishery is so inefficient at capturing the intended quarry.

The fact that the pair trawl herring fishery is so effective at harvesting a critically important forage species has always made me uncomfortable. Over the last few years (and particularly now) as other valuable commercial and recreational stocks are showing signs of trouble, I believe it is of paramount importance to make sure that this herring fishery is not jeopardizing a far larger economic engine in the northeast.

For selfish reasons, I would prefer to see the herring industry limited to small day boat seiners. I recognize, however, that you can not simply ban an existing player in the fishing industry. I do believe, however, that it is the council's duty to assure that this fishery is being treated equally to all other fisheries in respect to fishing cleanly, responsibly, fully documenting its catch, and keeping harvest levels safe.

To this end, I would ask that the council:

- Implement 100% observer coverage within this fishery. This should be non-negotiable.
- Prohibit, and implement strong penalties for, any dumping (slippage). This is a waste of a precious resource, and it prevents the true nature of the fishery from being documented.
- Prohibit Herring trawlers from fishing in areas closed to other fisheries. This seems like a no-brainer.

- Require the boats to document the weight of their catch rather than estimating. With the incredible effort that goes into the management process, it seems ridiculous to not have accurate catch data. Sound management requires sound data ... not estimates that could be biased.
- Furthermore, if it is shown (through observer coverage and dumping prohibitions) that this fishery is having adverse bycatch, I would ask that a plan for correcting the situation be written into the amendments.

Compared to the vast array of other stakeholders who depend (directly or indirectly) on the Herring stocks for their livelihoods, it seems highly inequitable that this relatively small player (The Herring Trawl industry) can have such free and unmonitored access to such a vital component of the marine food chain.

Please do not allow the current status of the fishery to continue.

Thank you very much for the hard work that you are doing, and for your consideration of my comments in your planning.

Sincerely,

Captain Randy Sigler
Sigler Guide Service
Marblehead, MA 01945
617-459-1798
Randy@Striper.com

Joan O'Leary

From: Michael Saunders <msaunders2001@hotmail.com>
Sent: Tuesday, March 20, 2012 9:33 AM
To: comments
Subject: Comments on Draft Amendment 5

Attn: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

I am an avid recreational fisherman who is a supporter of Honest By Catch. I have witnessed first hand the decline of Herring in my local runs and Menhaden in Plymouth, Boston Harbor, and Cape Cod Bay. NEFMC must approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. At minimum, the following actions must be approved:

- Honest By Catch supports Section 3.2.1.2 Alternative 2

100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life

- Honest By Catch supports Section 3.2.3.4 Alternative 4D

An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port

- Honest By Catch supports Section 3.4.4 Alternative 5

No herring mid water trawling in areas established to promote rebuilding of ground fish populations

- Honest By Catch supports Section 3.3.5, if modified to require immediate implementation of a river herring catch cap

An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery

- Honest By Catch supports Section 3.1.5 Option 2

A requirement to accurately weigh and report all catch is essential to any monitoring system

Thank You,
Mike Saunders
15 Crestwood Ave
Marshfield, MA 02050

Joan O'Leary

From: Paul Howard
Sent: Tuesday, March 20, 2012 9:40 AM
To: Lori Steele
Cc: Joan O'Leary
Subject: FW: comments on Atlantic Herring Fishery Management Plan

From: ravigloom@rediffmail.com [mailto:ravigloom@rediffmail.com]
Sent: Tuesday, March 20, 2012 9:37 AM
To: Paul Howard
Subject: comments on Atlantic Herring Fishery Management Plan

Dear Mr Howard,

The NMFS has repeatedly proven unable to enforce Atlantic herring quotas due to inadequate catch monitoring.
River herring populations remain depleted, forcing Atlantic seaboard states to close traditional fisheries and deprive recreational anglers and the public of this important resource. NMFS is now considering listing river herring under the Endangered Species Act.

Please conserve and manage these resources sustainably by approving this revision by supporting a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of the catch cap); 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2); an accountability system to discourage the wasteful slippage of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D); no herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5); a requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you,
Ravi Grover
POB 802103
Chicago IL 60680-2103

Follow Rediff Deal ho jaye! to get exciting offers in your city everyday.

From: ravigloom@rediffmail.com [mailto:ravigloom@rediffmail.com]
Sent: Tuesday, March 20, 2012 9:37 AM
To: Paul Howard
Subject: comments on Atlantic Herring Fishery Management Plan

Dear Mr Howard,

The NMFS has repeatedly proven unable to enforce Atlantic herring quotas due to inadequate catch monitoring.
River herring populations remain depleted, forcing Atlantic seaboard states to close traditional fisheries and deprive recreational anglers and the public of this important resource. NMFS is now considering listing river herring under the Endangered Species Act.

Please conserve and manage these resources sustainably by approving this revision by supporting a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of the catch cap); 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2); an accountability system to discourage the wasteful slippage of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D); no herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5); a requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you,
Ravi Grover
POB 802103
Chicago IL 60680-2103

Joan O'Leary

From: Janice Cranshaw <captcranny1@verizon.net>
Sent: Tuesday, March 20, 2012 6:07 PM
To: comments
Subject: Amendment V

What would make sense in the Herring fishery would be for the powers to be to step back and look at the big picture. I find it unbeleivable that the goverment is regulating every fishery known to mankind in the name of sound conservation, yet this fishery is the least regulated. On top of that ...this fish(herring) is the foundation for just about every fishery on our coast. What do you think is going to happen to the other fish in the ocean if they can not find forage. Would we not want to protect the very species that supports the most life in the ocean? Then why do these boat get regulated so loosely? I support 200% observation, also closed areas to protect river herring(I can not net a few herring with my grandkids and these guys are killing 3000lbs on a single haul. This is insanity. I compare it too....fixing the house and letting the foundation rot. Please see the vital link these fish have to all our fishery and make the tough call . and protect the greater good.These boats are killing not only herring but a lot of fisherman,s livlyhood Thank You capt Bruce Crabshaw

Joan O'Leary

From: Matt Patnaude <mattpatnaude@comcast.net>
Sent: Tuesday, March 20, 2012 9:26 PM
To: Doug Grout
Subject: Comments on Draft Amendment 5

Doug Grout, Chair

NEFMC Herring Oversight Committee

Re: Herring Amendment 5 DEIS

Dear Doug,

I am writing today to offer my support for the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

First, as a professional mariner operating on New England waters (I am a tugboat captain), I see these vessels operate first hand, year round. I see the bycatch get dumped overboard. It happens. Lest we take a history lesson of where these types of vessels have fished in the past, and what the outcome was.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, especially bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2). This is the most serious issue.

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C) Once again, the current regulations do nothing to prevent this—i see it happen first hand. They haul back until they get what they are looking for, the rest discarded.

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5) ---Once again, a large amount of what comes aboard is NOT their target species.

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Matthew Patnaude

8 Fayette St.

Beverly, MA 01915

Joan O'Leary

From: Lori Steele
Sent: Wednesday, March 21, 2012 10:21 AM
To: Joan O'Leary
Subject: FW: Ammendement 5

-----Original Message-----
From: David Gelfman [mailto:dagelf@aol.com]
Sent: Tuesday, March 20, 2012 9:44 PM
To: Lori Steele
Subject: Ammendement 5

Dear Ms. Steele
My name is David Gelfman. I operate the commercial Tuna boat Horsemackerel. I've been exasperated by the inability of the NEFMC to put some simple and effective regulations on the Mid-water tralwer fleet. There are five basic requirements that I feel would be useful and effective in controlling a fishery that is partially responsible for the collapse of all other fisheries in New England. The first is a weigh master system so there can be actual weight verification for quota enforcement purposes. The pacific whiting and pollack fisheries utilize this tecnology successfully. Both are large volume fisheries.
The second restriction should be constant observer coverage of catagory A and B permit holders. These 15 or so boats catch 95% of the quota. A third rule. The boats should be required to bring their cod ends on board so that the actual catch and bycatch can be recorded.
Fourth.There should be a River herring bycatch allowance that if surpassed immediatly closes the fishery for the season.
Fifth.The trawlers should be forbidden from entering the closewd areas. These nursury areas should be protected from this sort of fine mesh fishery that results in huge losses of non-target juvenile ground fish. The fact that forage species are treated in such a lax manner does not reinforce the ever vanishing trust of fishermen in their regulators.
Many much older and less profitable fisheries are subject to much stricter limitations even though their over all affect on the eco- system is far less destructive.
Sincerely David Gelfman

Joan O'Leary

From: james young <g-pooba@hotmail.com>
Sent: Wednesday, March 21, 2012 9:10 AM
To: comments
Subject: comments on draft amendment 5 [attn. paul j. howerd]

my name is james young, and I have been a comm. fisherman for 30 years , my comment on amendment 5 , is this, I have bin to the rivers I used to ketch herring as a boy , only to find NO TAKE HERRING sine's, I have seen the rewind of the ground fishing, because of the taking of the main bait fish in the ocean, it IS CALLED THE FOOD CHAIN! the same food chain you learned about in 4th grade in school, is is the 5 ton PINK ELEPHANT IN THE ROOM, for it to have taken this long for this critical issue to finally come up for regulation , is bordering on criminal, you have chosen to ignore the CANADIAN SCIENCE ON THIS ISSUE , I have personally seen, the F/V SEA HUNTER coming into new Bedford so overloaded, that the cost gard was following them incase they sank, THERE HAS TO BE 24 HOUR OBSERVER COVREG & A LIMITED ,DUMPING, ALONG WITH THE WEIGHING OF THE FISH! thank you for your time , JAMES YOUNG , FALL RIVER MASS

Joan O'Leary

From: Mass. Commercial Striped Bass Assoc. <masscommbass@gmail.com>
Sent: Wednesday, March 21, 2012 10:28 AM
To: comments
Subject: Comments on Draft Amendment 5

The Massachusetts Commercial Striped Bass Association would like to thank the NEFMC for considering measures designed to revise the Atlantic Herring Fishery Management Plan. MCSBA strongly urges you to approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. At minimum, the following actions must be approved:

-100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).

-An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Alternative 4D).

-No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).

-An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, Modified to require immediate implementation of a river herring catch cap).

-A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

The MCSBA consists of 125 Massachusetts resident commercial striped bass fishermen.

Thank you for your consideration,
Darren Saletta
MCSBA Co-Founder

Joan O'Leary

From: Lee Avery <averyret@gmail.com>
Sent: Thursday, March 22, 2012 8:14 AM
To: comments
Subject: Amendment 5

Both anecdotal information and studies show the effects the overfishing caused by the mid water trawlers has had. The food source for fish from cod to stripers and tuna has been devastated. Bycatch of river herring and haddock is also a problem. Why have thes problems been ignored while other segments of the fishery industry been forced to take all sorts of regulation?
I am just a recerational fisherman, but I care and I vote.
Please clamp down on this destructive fishery. Amendment 5 is a start.

Joan O'Leary

From: paul@portaphone.com
Sent: Wednesday, March 21, 2012 3:30 PM
To: comments
Subject: Herring netting

Stop the killing of the bait. You stopped it in the streams now stop the trawling!

Joan O'Leary

From: morserentals@yahoo.com
Sent: Sunday, March 25, 2012 10:19 PM
To: Doug Grout
Subject: Amendment 5

Doug,

I am writing to you to let you know that I'm all for amendment 5.

The time has come were we as fisherman, sportsman and any one who cares about the future of our fishing stocks to make a stand. The Atlantic herring is the number one forage food for many of our corp saltwater stocks of fish in New England. Atlantic cod, bluefin tuna, striped bass, whales and other predators of the atlantic.

The number one predator that we have to worry about is the people that fish for the Atlantic herring. Though they call themselves fisherman and yes they do have a life to live, and probably a family to support, they need regulation. They drag and drag for what to deplete the ocean of all the herring and other groundfish they can. When these boats are at work they are thinking to much of dollar signs and not about the future of what they are harvesting. If something is not done the future of the herring and the fish that hunt them will be in jeopardy. Maybe its to late and no matter what we do at this point , just might not help. But I have hope, and I want to believe that when my three sons are my age that they can still catch tuna, cod and striped bass.

These men and boats have gone to long without being regulated some of these guys might get upset sell there boats, quit fishing ,but they have no one to blame but themselves. It's time that they are regulated and they are accountable for their actions. They need to be monitored on all there catches as well as bi catches and they need to be monitored about where their fishing. If a midwater trawler drags where he is not supposed drag then he should be held accountable and fined. Fined so he'll never do it again or want to do it.

I believe that amendment 5 is a great start in starting a regulation to start protecting the future of a a great fishery, that in time could even be better.
My name is Steven Morse I have been fishing on the ocean for twelve years in and around the Portland Maine area. I was unable to make the meeting this last week and wanted to let you know that I support amendment 5.

Thank you for your time

Steve

Sent from my Verizon Wireless 4GLTE smartphone

Joan O'Leary

From: Lori Steele
Sent: Monday, March 26, 2012 8:54 AM
To: Joan O'Leary
Subject: FW: Herring Amendment 5 DEIS

From: Stephen Migliore [mailto:steve_migliore@myfairpoint.net]
Sent: Monday, March 26, 2012 7:32 AM
To: Lori Steele
Subject: Herring Amendment 5 DEIS

Dear Herring Oversight Committee,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a recreational fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Steve Migliore
603-236-6100
steve_migliore@myfairpoint.net

Joan O'Leary

From: Lisbeth Chapman <beth_chapman@inkair.com>
Sent: Monday, March 26, 2012 3:17 PM
To: comments
Subject: Comments on Amendment 5.

#1 PLEASE! You must take action. The "No Action" option cannot stand.

I count herring for the Friends of Herring River in Wellfleet as pre-research prior to our hoped for restoration of
1100 acres of impacted and degraded salt marsh. Our river is kept open by our herring warden. Our counts
have fallen by 2/3rds over the last three count years.

#2 Observer Coverage:
I urge the Council to adopt a 100% observer coverage/ monitoring program for the entire Atlantic Herring Fleet.
Such a monitoring program will benefit Atlantic herring as well as river herring populations, and provide necessary data for future management decisions.

#3 Safe Zones
I also support Alternative 3, suboption1: the establishment of "Safe Zones," temporal and geographical areas of closure to the Atlantic herring fishery. These zones based on Northeast Fisheries Observer Program (NEFOP) data from previous years. In addition, I urge for continued monitoring of the fishery for areas where river herring bycatch is encountered so that modifications to temporal protected areas can be based on the most recent and accurate data.

#4 Conservative Threshold Limit
Although it will be difficult to establish reasonable catch limits for river herring bycatch, a conservative threshold limit must be immediately set, based on the 2012 river herring stock assessment, and all areas closed, without delay, once the limit is reached. A mechanism must be in place to bring all catch onboard fishing vessels so that accurate sampling can be done by the independent observers and allow accountability for any "dumping" of river herring that occurs at sea.

It is absurd to keep going the way we have been going and expect a different outcome.

Lisbeth Wiley Chapman, Ink&Air
Celebrating 20 Years of Exceptional
PR Consulting for Professional Service Firms.
508-479-1033 **www.inkAir.com**
Author of "Get Media Smart! Build Your Reputation, Referrals & Revenue With Media Marketing"

Joan O'Leary

From: John Rice <john@ciifa.org>
Sent: Wednesday, March 28, 2012 6:10 AM
To: comments
Subject: Comments on Draft Amendment 5

To: NEFMC

Re: Amendment 5, River herring protection

I attended last nights public hearing in Plymouth. I spoke briefly about the need to do more to protect river herring, than what the other people attending had said previous to me.
Both CHOIR and Honest Bycatch are both calling for catch caps on river herring, but I do not feel that this is adequate to our present situation. Presently river herring are protected inshore by a long standing moratorium. Many different groups and agencies have made tremendous efforts to restore habitat and address the issues that are keeping these fish from recovering, yet the one issue that we keep overlooking is the catches of river herring by MW trawlers. I am not in favor of bycatch caps for river herring for the Atlantic herring fishery. I am in favor of Alternative 3, Option 1. To think that all the people that have toiled to bring river herring back, have done so just so a few boats owners can reap huge profits from their accidental catches of these fish is ridiculous.

Beyond this, my feelings on the rest of the proposals are;
I would like to whatever extent practicable, all trips to be weighed, not estimated.
I would like to see 100% observer coverage on all trips, to be paid for 100% by the industry, this is a nearly $50,000,000 industry, they can afford it. With regards to the observer coverage, I feel that all hauls need to be observed, in other words, no hauling unless the observer is present (not sleeping), which may mean needing 2 observers per trip.
I would like to see a zero dumping (slippage) rule.
No access to the groundfish closed areas, year 'round.
Exemptions for the shrimp fishery and also if needed for the Nantucket and Vineyard Sounds squid fishery.

Sincerely,
John Rice

--
John Rice - Director -><> CIIFA<><
P.O. Box 2008
Cotuit MA 02635
508-428-1556
john@ciifa.org
http://ciifa.org

March 19, 2012

RECEIVED
MAR 2 - 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Captain Paul Howard
New England Fishery Management Council
50 Water Street
Mill 2
Newburyport, MA 01950

More than four years ago, the public called for and the New England Fishery Management Council committed to, improving the management of industrial fishing in New England. Now, after several years of deliberation and tens of thousands of public comments, it's time to deliver on that promise of reform.

Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns. The revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet.

Since the initiation of Amendment 5, these problems have gotten worse. The National Marine Fisheries Service has repeatedly proved to be unable to enforce Atlantic herring quotas, the first step in fishery management, because of inadequate catch monitoring.

In addition, the practice of slipping, or dumping, catch at sea continues to undermine efforts to identify and record everything that is caught by herring vessels. Alarming interactions with groundfish also continue, to the point that mid-water trawl fishermen recently demanded and received a five-fold increase in their haddock by-catch allowance.

It is distressing that river herring populations remain depleted, forcing Atlantic seaboard states to close traditional fisheries and deprive recreational anglers and the public of this important resource. The NMFS is now considering listing river herring under the Endangered Species Act.

I urgently ask you, as a trustee of our nation's marine resources, to fulfill your duty to conserve and manage these resources sustainably by approving this long-awaited revision without further delay.

In particular, I agree with those who support:

- A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of the catch cap).
- 100 percent at-sea monitoring on all mid-water trawl fishing trips in order to provide reliable estimates of all catch, including by-catch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
- An accountability system to discourage the wasteful slippage of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
- A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Herring trawlers are the largest fishing vessels on the East Coast. Their football-field-size nets catch and kill millions of pounds of unintended catch every year, including depleted fish such as bluefin tuna, river herring, and shad, as well as dolphins and seabirds. River herring, an essential food for such animals as striped bass and osprey, are so depleted they are being considered for protection under the Endangered Species Act.

Thank you most sincerely for the opportunity to comment and for your sustained commitment and support of these high-priority reforms. It is time for a healthy, productive and sustainable ocean environment for everyone.

Yours respectfully,

J. Capozzelli
New York

NANTUCKET ANGLERS' CLUB, INC.
1 NEW WHALE STREET
NANTUCKET, MASS. 02554

(508) 228-2299

RECEIVED
MAR 23 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

March 15, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, Ma 01950

Re: Comments of Draft Herring Amendment 5

Dear Mr. Howard:

The Nantucket Anglers Club was established in 1969. Our 500 members are recreational fishermen that fish from both the beach and boat. Over the years we have watched the number of herring decline which has had a devastating effect on the inshore fishery. Codfish that were once plentiful close to shore have disappeared. Now the fall Striped Bass run once considered one of the best in the world is in jeopardy. The schools of herring that once migrated past the island in the fall are gone, swept up by the giant nets of the midwater trawlers. With the lost of herring the Stripers no longer hang around the island. The few fish that we do catch are small and skinny. There is nothing for them to eat. Our tuna fishermen have to run over 100 miles offshore to find any amount of herring and tuna. We urge you to adopt Amendment 5 with the following policies.

100% at-sea observer coverage of A&B vessels.

No Dumping Policy.

All landing be accurately weighted and reported.

Prohibit midwater trawling in closed groundfish areas.

Improve river herring Protections.

If the midwater trawl fleet is allowed to continue at its current effort or local fishery will all but disappear. Please act now.

Sincerely,

Robert R. DeCosta
Nantucket Anglers Club
Vice President

Town and County of Nantucket
Board of Selectmen • County Commissioners

Rick Atherton, Chairman
Robert R. DeCosta
Michael Kopko
Patricia Roggeveen
Whiting Willauer

16 Broad Street
Nantucket, Massachusetts 02554

Telephone (508) 228-7255
Facsimile (508) 228-7272
www.nantucket-ma.gov

C. Elizabeth Gibson
Town & County Manager

March 15, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill # 2
Newburyport, MA 01950

RECEIVED
MAR 23 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Re: Comments of Draft Amendment 5

Dear Mr. Howard:

Nantucket has a long history of fishing and it is an important part of our local economy. Herring are the major forage for Striped Bass, Bluefish, Cod and Tuna in the waters around Nantucket. The fact that the mid-water trawl fleet has been allowed to fish the inshore waters off the Cape and Islands has had a devastating effect on our local fishery. Herring have all but disappeared around the Island. We urge you to adopt Amendment 5 with emphasis on the following points.

- 100% at-sea observer coverage of A&B vessels
- No Dumping policy
- All landing be accurately weighted and reported
- Prohibit mid-water trawling in closed groundfish areas
- Improve river herring protections

If the mid-water trawl fleet is allowed to continue at its current effort our local fishery will all but disappear. Please act now. Thank you.

Sincerely,

Rick Atherton
Chairman

RECEIVED
MAR 29 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Theodore J. Ligenza
134 Pleasant Street
South Chatham, MA 02659
F/V Riene Marie
March 25, 2012

New England Fisheries Management Council
50 Water Street, Mill 2
Newburyport, MA 01950
Comments on Draft Herring Amendment 5

Dear Sirs;

The herring trawlers need 300% observer coverage paid for by the United States Government. The Government should pay for this coverage because of the high impacts of the herring fishery has on the rest of the Northeasts Fisheries. There needs to be a senior observer that is in charge of the safety and well being of two of the regular observers. The senior observer needs to make sure that the regular observers are given proper access to all the fish being taken aboard. The senior observer should be there to help the regular observer when there is more going on than one person can handle. When the mid water trawler commits a major infraction like slippage, it would be the senior observers job to report the incident and take the necessary action required. The senior observer needs to be someone with the stature age, experience and be given the authority to handle the job. There needs to be two regular observers because the boat can fish 24 hours a day. Expecting one person to observe everything that is going on in a 150 foot boat that fishes around the clock for multiple day trips is unreasonable.

I have talked to a number of people who have worked as observers on herring trawlers, one told me they were not given proper protocol for getting proper data, another told me he was told to go through the fish after they had been culled by the crew. If this kind of thing has been going on so far it is going to be necessary to be more serious about getting good data. Many consider the result of the herring fishery tragic so far, it is time to be more serious about it.

Everything that comes in the net needs to come in the boat and gone through just like all the rest of the fishermen. There should be no slippage allowed. The herring fleet should have a total allowable catch for herring, for that matter they shouldn't be allowed to fish close to shore where the two species interact.

The herring fleet needs to be held responsible for everything they catch. They need to have quotas for cod, pollock, hake, and what ever kind of fish they come up with. They should be required to own or buy quota for any fish they catch as most every fishermen in the Northeast has to do now. This should be no problem for the mid water fleet because we were informed by the nice man with the Irish accent that the herring fishery is the cleanest fishery in the Northeast with hardly any by-catch at all. The Irishman spoke at the meeting in Fairhaven late March 2012.

For that matter all this crap could be cut quite simply with total recall. Everything that they catch must be brought in and sold. They need observers on deck to make sure there is no slippage. The catch is gone through and weighed by dock side monitors who are independent entities of the herring business.

Sincerely Theodore Ligenza

Theodore J. Ligenza

From: John Rice <john@ciifa.org>
Sent: Wednesday, March 28, 2012 6:10 AM
To: comments
Subject: Comments on Draft Amendment 5

To: NEFMC

Re: Amendment 5, River herring protection

I attended last nights public hearing in Plymouth. I spoke briefly about the need to do more to protect river herring, than what the other people attending had said previous to me.
Both CHOIR and Honest Bycatch are both calling for catch caps on river herring, but I do not feel that this is adequate to our present situation. Presently river herring are protected inshore by a long standing moratorium. Many different groups and agencies have made tremendous efforts to restore habitat and address the issues that are keeping these fish from recovering, yet the one issue that we keep overlooking is the catches of river herring by MW trawlers. I am not in favor of bycatch caps for river herring for the Atlantic herring fishery. I am in favor of Alternative 3, Option 1. To think that all the people that have toiled to bring river herring back, have done so just so a few boats owners can reap huge profits from their accidental catches of these fish is ridiculous.

Beyond this, my feelings on the rest of the proposals are;
I would like to whatever extent practicable, all trips to be weighed, not estimated.
I would like to see 100% observer coverage on all trips, to be paid for 100% by the industry, this is a nearly $50,000,000 industry, they can afford it. With regards to the observer coverage, I feel that all hauls need to be observed, in other words, no hauling unless the observer is present (not sleeping), which may mean needing 2 observers per trip.
I would like to see a zero dumping (slippage) rule.
No access to the groundfish closed areas, year 'round.
Exemptions for the shrimp fishery and also if needed for the Nantucket and Vineyard Sounds squid fishery.

Sincerely,
John Rice

--
John Rice - Director -><> CIIFA<><
P.O. Box 2008
Cotuit MA 02635
508-428-1556
john@ciifa.org
http://ciifa.org

March 17, 2012

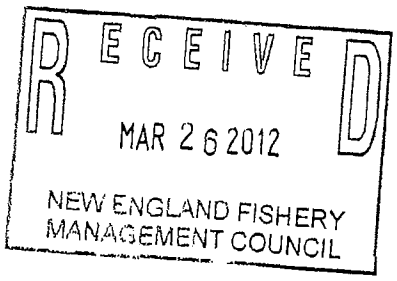
Paul J. Howard, Executive Director

New England Fishery Management Council

50 Water Street Mill #2

Newburyport MA 01950

RE: Comments on Draft Amendment 5



Dear Mr. Howard:

On behalf of the 131 members that comprise the Stellwagen Bank Charter Boat Association (SBCBA), we ask that you and the New England Fishery Management Council take action to reduce the by-catch, improve the monitoring system, and impose more effective effort controls over the Atlantic Herring Fishery.

We believe the noticeable decline in herring stocks is largely attributed to midwater trawl vessels, both single and paired. We ask that NEFMC help address the declining herring stocks by adopting the following proposed alternatives as specified in the Draft Amendment 5:

Section 3.1.5 Option 2 Require Dealers to Accurately Weigh All Fish

Section 3.2.1.2 Alternative 2 Require 100% Observer Coverage on Limited Access Herring Vessels

Section 3.2.3.4 Alternative 4D Closed Area I Provision with Trip Termination Only (5 events)

Section 3.3.5 if modified, impose cap on the total amount of river herring landed in the Atlantic herring fishery

Section 3.4.4 Alternative 5 Closed Areas – prohibit midwater trawl fishing in year-round closed areas

Thank you for both your consideration and time.

Respectfully Yours,

Steven James

President, SBCBA

RECEIVED
MAR 3 1 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

31 March 2012

Members of the New England Fisheries Management Council;

I am not as well versed on the herring issues as I should be and that is unfortunate. However, I do remember the beginning when the stock assessment from the US side declared that there were 200,000 metric tons that could be harvested without impacting the resource. It seems to me that the Canadians reviewing the same information arrived at a much different conclusion. Scientists usually agree unless there is a political agenda or motivation which skews the math and allows for a conclusion which is not defensible.

I also know that many of the species within our continental shelf prey on herring at one stage and form or another. The large pelagics like the Atlantic bluefin which I have fished commercially since 1968 also enter the shallower areas to fatten after a highly migratory passage. The withdrawl of significant tonnages of bait (herring) stresses local stocks and leads to the continued migration of others. The dictum of the NMFS was always based on the concept of the strengthening of the stocks. This in its simplest form would suggest that taking food from a recovering resource would be an error. Fishermen dependent on healthy stocks and access have certainly been drawn into further conflict.....with the Government and controlling Agencies as well as with fellow fishermen.

In a perfect world the error would not have been made. However, after these many years this horse is well out of the barn. Usually in business one considers the consequences of a mistake and once realizing it the first and immediate correction is the best. Too late for that now.....mea culpa will not be forthcoming either.

I would suggest an overall lower quota for those "new" entrants or companies still involved in the fishery since the declaration of additional available tonnage.....and consider a relocation compensation to further discourage heavy predation. The onetime compensation would give those shoreside facilities and boats an option towards their future.....and in a fashion acknowledge that NMFS punched over their scientific weight. Hard lessons.....and I am sure that the Government will say that they have no money to do such a thing. The rebuttal to that response might be that their overestimation has caused the private industries' financial repercussion to far exceed whatever settlement might be reached.

I know there is bycatch and the observer program is flawed at many levels. However, I would insist that there be 100% coverage on the non traditional boats (pair trawlers) and a10% coverage on the historic vessels. That is a lot of coverage but it needs to be done to assuage the common fears of bycatch. Bluefin tuna, Narragansett near shore in the winter of 2012 would be an example.

Please consider my comments as the decision making progress in regard to the Atlantic herring fishery continues. NMFS has always had the potential to do what was once considered "the right thing". It still has that ability.

Sincerely,

George Purmont
P.O. Box 951
Little Compton, RI 02837

Joan O'Leary

From: john lawless <jlawless79@gmail.com>
Sent: Saturday, March 31, 2012 8:58 PM
To: comments
Subject: Herring Trawling -

Sirs/Madams,

I am a person who makes his living in the maritme sector and while i understand the need for fisherman to make their living by catching fish, I am concerned with the steady and substantial decline of the herring population. I live in Weymouth Ma. and have personally witnessed firsthand the decimation of the herring runs in my area. We all have ownership to be stewards of the sea for our childens sake and i am in favor of the motions below:

1. 100 percent at-sea monitoring (Section 3.2.1.2 Alternative 2) on all category A & B midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life.

2. Discourage the wasteful dumping of catch, Section 3.2.3.4 Alternative 4D including the fleet-wide limit of five slippage events per management area. Operational discards are dumping of valuable natural resources and must be included.

3. No herring mid water trawling in areas established to promote rebuilding of ground fish populations (Section 3.4.4 Alternative 5).

4. We can not wait for new science to protect river herring. We support an immediate catch cap based on recent catch. To limit what is currently being killed as by catch is a good start. We support Section 3.3.5 only if modified to require immediate implementation of a catch cap.

John Lawless

Weymouth, MA

617.365.5003

Joan O'Leary

From: Jgoodhart56@aol.com
Sent: Tuesday, April 03, 2012 1:10 PM
To: comments
Subject: Herring

To Whom it May Concern:

I feel it is in the best interest of all fisheries participants, except those in the pair trawl business, to severely restrict or eliminate the pair trawl herring fleet. Their massive removal of forage fish and their enormous and indiscriminate by-catch threaten the recovery of many important fish stocks.

Thank you,

Capt. James C. Goodhart
56 Boardman St.
Newburyport, MA 01950

Joan O'Leary

From: brandiellen@comcast.net
Sent: Monday, April 02, 2012 10:43 AM
To: comments
Subject: Herring 100% coverage

To whom it may concern

As a commercial fisherman, and a charter Capt. I think it is very important to have 100% coverage on all draggers wherever there are herring, and menhaden.

Thank you Capt. Dale Tripp

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Dear Mr. Howard,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring. Populations of these fish have declined by 99 percent and are so depleted that they are being considered for protection under the Endangered Species Act.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,

Lexington, MA

April 4, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

RE: Comments on Draft Amendment 5

Dear Mr. Howard,

My name is Charlie Johnson and I am a rod and reel fisherman and operate a charter boat in Rhode Island. I attended your March 28th meeting on the herring management and although good things were proposed, I was disappointed that there was no talk of catch reduction.

For years the main focus has been to restore cod and haddock, halibut, striped bass and blue fin tuna and to increase whale population. But guess what the largest part of their diet is? Herring.

The stripers were restored because they were and are easy to raise in hatcheries. Now they're short of food and many are becoming sick because of lack of food. The haddock have started recovering because of closed spawning areas. Yet your own study has shown they have not developed properly because of lack of food. Gee, ya think maybe we took too many herring?

And River herring is a whole other issue, but our stocks are now a single digit percent of what I knew them to be 50 years ago in Rhode Island. Any protection for them at sea would be a help.

Rhode Island used to have mackerel almost year round. There were acres of mackerel on the south shore, harbors and bays all summer. Now I would challenge anyone to catch 1 mackerel in RI waters in the summer.

RI waters used to have many sand eels, but their numbers have also drastically declined over the years. The offshore halfbeaks and other baitfish that you would see on top of the water are for the most part gone, for reasons unknown.

Currently whale and seal populations are on the rise. They are now eating an increased amount of herring. With the demise of other food fish, the herring catch needs to be reduced. The economic value of herring is low compared to the value of herring predators.

Lastly, I would like to see a permit class for people like myself who would only occasionally catch small quantities for bait.

Sincerely,

Capt. Charlie Johnson

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Dear Mr. Howard,

I thank the NEFMC for considering measures designed to revise the Atlantic Herring Fishery Management Plan, and I strongly urge you to approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. At the minimum, the following actions must be approved:

- 100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).

- An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).

- No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).

- An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, Modified to require immediate implementation of a river herring catch cap).

- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Sincerely,

Carmen Lee (CARMEN LEE)

Gloucester, MA.

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Dear Mr. Howard,

I am writing about critical alternatives that must be approved in Amendment 5. I urge you most strongly to approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. These actions must be approved:

-100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).

- An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).

- No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).

- An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, Modified to require immediate implementation of a river herring catch cap).

- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering measures designed to revise the Atlantic Herring Fishery Management Plan.

Sincerely,

Ann Woll

ANN WOLL
BAY VIEW, GLOUCESTER, MA
and
CAMBRIDGE, MA

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Dear Mr. Howard,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring.

Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. Many tireless citizens carefully shepherd migrating river herring by hand past obstacles in rivers. The New England Fishery Management Council must support, not undermine, these efforts.

When the council finalizes its revision to the Atlantic Herring Fishery Management Plan, it is critical that it approves a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

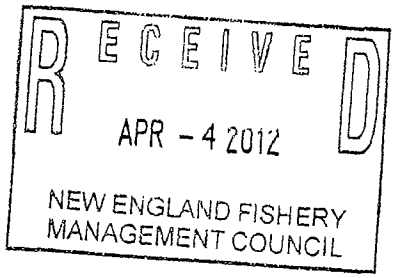
- A catch limit or cap on the total amount of river herring caught in the Atlantic herring fishery .
- 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life.
- An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port.
- A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations.
- A requirement to accurately weigh and report all catch.

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,

Jane Little
Cambridge, MA.

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950



Dear Mr. Howard,

I am most concerned about the badly managed industrial fishing, especially with regard to the herring population. Most Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch in the industrial fishery targeting a different species, Atlantic herring.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering my comments.

Sincerely,

Mary M Wood
17 Dove Ave.
Arlington, MA 02474

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Dear Mr. Howard,

As a concerned citizen, I humbly urge the NEFMC to approve a comprehensive monitoring and management reform that brings greater accountability and oversight to the industrial trawl fleet.

Please approve:
-100% at-sea monitoring on all midwater trawl fishing trips;
- an accountability system to discourage wasteful dumping of catch;
- no herring midwater trawling in areas that promote rebuilding of groundfish
- an immediate catch limit or cap on the total amount of river herring caught
- a requirement to accurately weigh and report all catch.

Thank you for your attention.

Sincerely,

Dr. Robert Chew
9 Dorrell St., Cambridge, MA 02138

Attn.: Comments on Draft Amendment 5
Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill #2
Newburyport MA 01950

RECEIVED
APR - 4 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Dear Mr. Howard,

I am very concerned about the New England Fisheries Management Council Amendment 5, and I urge the NEFMC to approve at the minimum:

1. 100% at-sea monitoring on all midwater trawl fishing trips
2. an accountability system to discourage wasteful dumping of catch;
3. no herring midwater trawling in areas established to promote rebuilding of groundfish populations;
4. an immediate catch limit or cap on the total amount of river herring caught in the Atlantic herring fishery;
5. a requirement to accurately weigh and report all catch.

Thank you for your attention.

Sincerely,

George Y Cha
5 Willow Crescent
Brookline, MA 02445

F/V DARANA R
James A. Ruhle
P.O.Box 302
Wanchese, North Carolina 27981
Telephone: (252) 473-3210 **Fax (252) 473-4831**
Email FVDaranar@aol.com

RECEIVED
APR - 5 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Mr. Paul Howard
New England Fishery Management Council
50 Water Street
Newburyport, MA 01550

March 27, 2012

Mr. Howard:

As long term particpants in the traditional single boat bottom trawl Herring Fishery, we offer the following comments on Amendment 5 to the Atlantic Herring FMP.

3.1.5 Management Measurers-FMP Adjustments

Option 2 Require Dealers to accurately weigh all fish

The majority of Herring landed are pumped out of vessels into tanker trucks or vat, (tub) trucks. Water is necessary to pump fish and will always vary in amount depending on many variables . Simply weighing a truck empty and then full will not provide an accurate fish weight.

The Council and NMFS should accept the calculation used by dealers and processing plants to determine weight of fish purchased. Regardless of type or size of trucks, a calculation from pounds to dollars is applied. i.e. 22 vat truck at 1800 lbs. per vat equals 39,600 lbs.

Processing plants and bait distributers randomly after removing water, weigh any number of vats on each truck and average the weight to calculate weight of fish being purchased.

Once there is acceptance to the above calculation then sub-option 2C becomes the next required action.

We do not support increasing the frequency of VTR and Dealer Reports.
The new requirement implemented in late 2012 requires all vessels to electrically report Herring catches and discards by area the day the fish are caught. This new reporting requirement should be sufficient to maintain weekly VTR and Dealer Report submissions. This new law was not yet in effect when Amend 5 document was created.

3.2.1 Catch Monitoring at Sea

The Pate/Touchtone Report clearly states that management actions implemented by the council and the agency have lacked sufficient review as to their effectiveness, and intended or unintended results.

Considering that beginning with the development of Amend 4 to the Herring FMP in 2008 the level both at sea observer coverage and dockside monitoring Increased significantly for the Herring fishery, we recommend that the Herring Committee and the Council request the Herring P.D.T. to do a technical analysis on a vessel by vessel basis to determine the performance of each vessel in the fishery. We believe that the number of observed trips and the level of dockside monitoring combined with improved species identification protocols will provide data that would be superior to earlier years of observations and better determination of how the fishery currently performs.

Our rational for this analysis would be to provide current, accurate data that would be used in the decision making process for Amend. 5.

From personal experience over many years of fishing we are confident that the Herring Fishery is the second cleanest fishery in New England behind only the lobster fishery.

It is our belief that significant by catch events occur NOT across the fleet, but with only a small number of vessels and often times the same vessels.

We suggest that the Council and the Agency utilize this analysis to provide an incentive to the fleet to fish responsively and recognize those that consistently perform well with a level of observer coverage that meets the NEFSC recommended coverage.

Those vessels that have been identified with higher and more frequent by catch interactions would be required a higher level of Observer coverage until such time that they can demonstrate reduced by catch interactions.

3.3.2.2.4 River Herring Monitoring/ Avoidance

We support Alternative 2-Option 4

Rational-This winters mild conditions and above average sea temperature would have resulted in all options in AMED 5 with monitoring /avoidance areas missing

the mark by 1,000%. The only way to have a successful by-catch avoidance program is in real time. This seasons MADMF and SMAST Program will provide data to support long term by catch avoidance strategies in real time that can be extremely effective.

OTHER RECOMMENDATIONS

1- Separate by catch data prior to amendment 4 by increasing the threshold for directed herring trips from 1,000lbs. to 10,000 lbs (minimum) .

   The current threshold of 1,000 lbs. does not differentiate between a mixed small mesh trip and a directed herring trip.

2. Require observers on directed herring trips to ask the Captain before sailing if there are any herring aboard and how many.

   Rational-Herring that have been reported and landed, then taken back to sea to be discarded would have an explanation for discarding. i.e. poor quality, size, no market for sale.
   It should be noted that herring vessels may take fish back to sea if trucks for off loading are not available when needed. As trucks become available, the fish carried over as well additional fish would be off-loaded.

James Ruhle

Robert Ruhle

Steven Ruhle

To: Mr. Paul J. Howard, Executive Director
New England Fishery Management Council

RECEIVED
APR - 6 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

From: Roger (Bo) Adams
59 Crown Point Rd.
Rochester, NH 03867

Mr. Howard,

I have held a federal tuna permit since 1992 in either the Harpoon Category or the General Category with the exception of one season in the late 90's. The purpose for my letter is to encourage your consideration of several critical alternatives in Amendment 5.

As you know this Amendment was initiated about 5 years ago as a result of fishermen and others whose livelihood depends on the various fisheries and tourism opportunities in the Gulf of Maine and Georges Bank. I can personally attest to how grim things were in the Gulf of Maine from 2002 through 2007. It was an empty ocean with very few whales or tuna to be seen. The steps taken 5 years ago have produced some very favorable results. Frankly the past three years have been much like the "good old days" back in the late seventies, though the eighties and into the 90's. It is of the utmost importance that we not take our eye off the ball and realize that the time is now for NEFMC to seriously consider and enact improved procedures in order to prevent losing any of the valuable ground that has been gained.

I believe these huge herring trawlers are the largest fishing vessels on the east coast. They are nothing short of an enormous vacuum cleaner that literally sucks up everything in its or their path. It is an indiscriminant fishery that kills millions of pound of unintended catch including haddock, cod, river herring and occasionally tuna. Their intended catch of ocean herring is without a doubt the major forage fish for the vast majority of all commercial fisheries as well as our ocean going mammals. These trawlers are terribly efficient. These traits demand more than self-reported weight estimations and I believe that the current observer time allotments on the sea are insufficient; leading to dramatic inaccuracies and it is unacceptable that in most areas dumping catches before they are sampled is still allowed. There are simply too many opportunities to bend the facts in favor of the

a: C5 (4/9)

mid water trawlers. Lastly it is not conscionable to allow these trawlers to fish on the same grounds that the ground fishing fleet has been shut out of.

To these aforementioned points I ask that you approve management reform that will bring more and improved accountability and oversight on all large herring trawlers, specifically:

1. Implement 100% observer coverage regardless of the time of day for all Category A and B herring trawlers to ensure reliable data of intended catch and by catch (Section 3.2.1.2).
2. Institute a trip termination provision after 10 dumping events in Closed Area 1. There needs to be a disincentive so that the legitimate exceptions are not abused as I believe they have in the past (Section 3.2.3.4 Alternative 4C).
3. Prohibit midwater trawlers in the herring fishery from accessing the Closed Groundfish Areas (Section 3.4.4 Alternative 5). These trawlers were allowed in under the mistaken assumption that they could not or would not catch groundfish, how wrong we all were! It is incomprehensible that these mid water trawlers are allowed to tow their tiny mesh gear through grounds that are now off limits to the ground fish fleet. (Section 3.4.4 Alternative 5).
4. Implement acceptable procedures that will require weighing of all catch across the fishery (Section 3.5.1 Option 2). I cannot understand how this important fishery of a stock that the ocean fishermen and tourism based businesses depend on is not already required to weigh its' catch. Again this practice is incomprehensible to have landing data based on unverifiable estimations by boat captains and fish dealers!

Thank you Mr. Howard for your time and anticipated assistance on this crucial subject,

Sincerely,

Bo Adams
F/V Cindy K

Paul J. Howard
Executive Director
50 Water Street, Mill #2
Newburyport, MA 01950

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

April 6, 2012

Dear Paul,

My name is Raymond W. Kane and wish to submit written comment on Sea Herring Draft Amendment 5.

1. Catch Weighing Section 3.1.5
   a. Primary Decision
      i. Support Option 2: Dealers must accurately weigh all landed fish

   b. Secondary Decisions

      i. Support Sub-Option 2A: annual documentation of catch composition estimation methodology
      ii. Support Sub-Option 2B : Weekly** reporting of catch composition estimation for each individual landing
      iii. Support sub Option 2C: Dealer participation in SAFIS with vessel error-checking through Fish-on-Line

2. At-Sea Observer Coverage Section 3.2.1
   a. Primary Decision
      i. Support alternative 2: 100% At-Sea Observer coverage on Limited Access Herring Vessels (Amended to include Category A and B only)
   b. Secondary Decisions
      i. Support Funding Option 2: Federal and Industry Funds
      ii. Support Service Provider Option 1: (No Action)

3. Measures to Address Net slippage Section 3.2.3
   a. Primary Decision
      i. Support Option 4 C: Dumping prohibition with limited exceptions and accountability measures applied when exceptions are exercised and catch is dumped

4. Measures to Address River Herring by catch Section3.3
   a. Primary Decision
      i. Support Modification of Section 3.3.5 to require immediate implementation of a river herring catch cap
      ii. Support Alternative 3, Option 1: Closed Areas

5. Measures to Address MWT Access to Groundfish closed Areas Section 3.4
   a. Primary Decision
      i. Support Alternative 5: Closed Areas
   b. Secondary Decisions
      i. Support bottom-contact prohibition and bottom-contact monitoring as Required parameters of any EFP allowing experimental access to GFCA's
      ii. Support full observer coverage (>100% if necessary) and onboard catch weighing as required parameters of any EFP
      iii. Support ground fish by catch triggers or EFP-specific caps on ground fish as required parameters of any EFP

In closing, I question whether this highly efficient gear type would have ever been permitted by NEFMC after the NEFSC down graded the herring assessment from 1.2 million metric ton to 660,000 metric ton. Furthermore, I ask the NEFMC implement a herring management plan, something it has lacked in the past 12 years, that is amenable to thousands of stake holders and the entire marine ecosystem.

Sincerely,

Raymond w Kane

Massachusetts Lobstermen's Association, Inc.
8 Otis Place
Scituate, MA 02066-1323
Bus. (781) 545-6984 Fax (781) 545-7837

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

April 5, 2012

Paul J. Howard, Executive Director
50 Water Street, Mill #2
Newburyport, MA 01950

Re: Comments on Draft Amendment 5

Dear Paul,

The 1300 member Massachusetts Lobstermen's Association would like to submit the following comments regarding Amendment 5 to the Fishery Management Plan for Atlantic Herring.

Our Massachusetts lobster fishermen depend heavily on having enough Atlantic Herring in order to conduct their fishing operations. Most of their access to supply comes from vessels based in Massachusetts. This means that they depend on mid-water and pair trawlers. While we are not enamored with these types of operations, we nevertheless understand that these boats are our main lifeline when it comes to herring bait. Little if any of Purse seine herring bait, which are mostly from Maine, gets down to supply our boats. We therefore, first of all want to insist that these vessels be allowed to continue to fish, certainly, within the bounds of the quotas set by NMFS but also without the trappings of too difficult a set of restrictions. If the rules or restrictions push these vessels too far, the cost factor increases and in turn the cost of buying the product gets pushed higher, and our fishermen get hurt even more. We therefore ask you during your deliberations on the Amendment, to take these thoughts into consideration.

Our further comments are as follows:

Carrier Vessels sec. 3.1.3.2

No Comment

Transfer of Herring At Sea sec 3.1.3.3

Option 1- We **support** this option to ensure proper documentation of what is being caught is reported.

Option 2- We **oppose** limits as to what herring vessels can transfer at sea. If any herring vessel has bait, it should be allowed to transfer those fish, at sea, if necessary but should keep records of what has been transferred.

Option 3- We **oppose** this option in that it states that "Non permitted vessels (lobster boats?) would be prohibited from receiving herring at-sea for bait"

Trip Notification sec 3.1.4

No Comment

Reporting for Permitted Herring Dealers sec 3.1.5

Option 1 - We **support** this option. Dealers should report haddock landings as they should but we also support being able to sell them. The fish are dead and to waste them would be a shame.

Changes to Open Access Permits in Mackerel Vessels sec 3.1.6

No Comment

Alternatives to Allocate Observer Coverage of Limited Access Herring Vessels sec 3.2.1

Alternative 2- We **support** this alternative only if the observer coverage is at a reasonable cost. Remember here, that this cost will be added to the cost of bait sold to our fishermen. We actually believe that if the NMFS wants this much observer coverage then the NMFS should pay for it. How about making those who are so adamant that this be done pay for this. If the Herring fleet must pay or even NMFS, it should be similar to what is paid on the West Coast such as under $400 per day! Do we really need 100% observer coverage? Are we putting more precise information on this fishery than NMFS does for other fisheries, noting that nothing is ever perfect? For example, do we observe what is taken by the recreational fishery?

Improving Sea Sampling sec 3.2.2

Option 1- We **support** no further action on this because it is adequate as is now.

Net Slippage sec 3.2.3

No comment – This is "picky" to the extreme!

Maximized Retention Alternative sec 3.2.4

No comment

River Herring Monitoring/Avoidance sec 3.3.2

Alternative 2 – We support this but only to a degree. The Herring fleet has indicated that it is willing to stay away from River Herring "hot spots" if NMFS can adequately identify those areas. This is the attempt by the Herring fleet to cooperate in avoiding a River Herring by-catch. Work with them on this. We all know that the River Herring problem is not and has never been the fault of the Atlantic Herring fleet but rather the fault of river passageways, water quality issues and predation by other species. The Atlantic Herring fleet should not be blamed or persecuted by other fishing sectors (Recreational, Tuna, Environmental interests) who claim these vessels are the cause. Still, the Atlantic Herring boats should be allowed to do their part for restoring the River Herring stock but the entire focus for restoration should not be loaded on these fishermen.

Monitoring and Avoidance sec 3.3.2.2

See above comments 3.3.2

Options still Under By-Catch Avoidance for River Herring sec 3.3.2.2.4, 3.3.3

See above comments 3.3.2

More Options on By-Catch sec 3.3.3.2

See above. We **oppose** closed Areas unless the Atlantic Herring fleet agrees to some temporary closed areas.

Alternative For Herring Fishermen in Groundfish Closed Areas sec 3.4.1

We **support** Alternative 1. No Action. Allow these boats to fish in these areas but then they should report all fish taken. They are not targeting other species and if NMFS closes these areas to Herring boats and then closes other Areas to them for other reasons and quotas, where can they fish? We still need the bait!!

Alternative 100% Observer Coverage sec 3.4.2

See above comments 3.2.1 comments on observer coverage

Alternative Closed Areas sec 3.4.4

See above comments 3.4.1

Other

We **support** the proper weighing provisions to better provide for accountability of what has been landed. The Herring industry/buyers agree with this as do we.

In summation, the Massachusetts Lobstermen's Association must reiterate that the herring bait must be made available to our fishermen and any provisions that would restrict our supply beyond the limits which we feel are already limited with the quota management system, will be vigorously opposed by our lobster industry. We must admit that we feel much of this Amendment is aimed at "bashing" the Herring boats that provide us with our herring bait. We also believe that these other sectors that are so opposed to these operations do not care if they cause a severe hardship in availability or costs for our Massachusetts lobster fishermen.

We sincerely hope and trust that you, the Federal Fishery Council and the Federal Fisheries Service will weigh all the alternatives and options and will make recommendations or decisions which will allow our Herring lobster bait to be available to our lobster fishermen.

Respectfully yours,

William Adler
Executive Director

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

April 4, 2012

RE: Comments on Draft Herring Amendment 5

A. Background Information

I am a husband/father/grandfather, veteran and American citizen, 77 years young. I am also a world wide recognized PhD. (tree physiology(Cornell University, 1964). I have worked for the US and Canadian governments in the areas of pollution effects on plants and been an independent consultant saving trees across this country and around the world (one at a time) for the past 35 years. I do know and support the value of proper science appropriately applied.

I have been involved with the fishing industry on Cape Cod since the early 1950's to the present moment and plan to be involved until I can no longer function. I know the industry from the eyes of a child, commercial long lining, long raking, jigging for cod, steamer and sea worm digging, and scalloping. I know the recreation end of fishing, being an avid fly fisherman pursuing Stripers, blues, tuna, scup, silver perch, to name a few species.

I write today from a perspective that touches on ***all*** of these facets of my life to date. Mainly though, as it relates to my grandchildren and the well being of our Planet Earth and how we are currently inappropriately manipulating the available data (some accurate and some suspect).

B. DEFINITION: MONSTER MID WATER TANDEM TRAWLERS/ MONSTER NETS TECHNOLOGY (MMWTT/MNT) – Is that REALLY "fishing" as it has been defined for EONS??

I strongly state NO! I have no problem with ***appropriate*** hand- set nets which have been used to catch fish to feed the world's population since before biblical times. The use of boats and even huge boats is also appropriate when kept in check. The use of electronic methods to identity fish? Again appropriately utilized I have no problem.

So what is my argument with the monster tandem trawler technique? The operative words are ***Monster Mid Water Trawlers and Monster Nets*** hooked together as a ***TWOSOME*** . The net which is towed between the vessels which are the largest and most advanced on the East Coast being up to 165 feet in length, is ***300 hundred feet*** (the size of a football field and of small mesh size.) It can be set at any depth the very intelligent captain chooses. The net combined with electronic gear in the hands of these captains can almost identify the type scale on a fish they are so sensitive. This technology is being employed to butcher unsuspecting fish with the single goal of MONEY!

Why is this harmful you ask?? I will tell you why. The* HUGE *volume (often 500,000 pounds of sea life per tow and they make MANY Tows) of Sea and River herring, Striped Bass and any other form of sea life caught or destroyed by the immense negative effects of such a HUGE and alien NET intrusion into an otherwise BALANCED ecosystem. This act totally devastates and creates IMBALANCE in that system with long term effects yet to be determined. They do not leave any stock behind as forage or for reproduction. We are only just now experiencing the short term lethal effects of this technology. The "NET" does not discriminate it kills and maims all of the fish in it. The industry has developed this made up word called "Bycatch"! "By-catch" is defined as those fish that "got in the way" of this Monster small mesh net. The MMWTT owners, you know, treat them like "collateral damage" likened to civilians killed in a war. Or like "clear cutting a forest " and leaving no seedlings for regrowth. We can see the immediate effect but have no clue to the long term

negative effects on our Planet Earth. They "shoot" these still live fish back into the ocean out of these "water cannons" with great pressure , as " bycatch i.e.trash". They have no reverence or respect for the sea life or Planet Ocean upon which they depend on for their VERY livelihood. They do not recognize that in the process of the MMWTT they are rapidly destroying that very part of Nature , Ocean Planet which is necessary to the long term survival of all humankind on Planet Earth!

I want you all to realize this simple fact. It is that the technology is ***ahead*** of the legislation process. We need time to evaluate it. We KNOW the short term effects. These people have every right to "make a living". They do NOT have a right to destroy that which supports them and all of humanity in the process!! Just as in the auto industry (a very important section of our economy), if they have a "bad component". A recall is ordered and a "fix" is incorporated. In other words, they are being accountable for their actions. This is more difficult with a component of Nature as so little is truly known. It is very hard to "prove" a point especially when suspect data is being manipulated by all sides. The Monster Trawler"s Industry know and utilize this factor as a stalling technique.

The reason that the 2008 fish stock data was so inaccurate is simple- the "human scientific assumption" fed into the computer was inaccurate. It did not take into account the debilitating effect of this Monster technology on fish stocks. To err is human. But not to correct that error is indefensible. We know how to "fix" it. Let's get on with it. I give a broad outline of how to achieve those changes in the following section (C) of this document.

People wake up - we are in a war for the survival of life as we have known it. The good news is that we CAN and must do something about this NOW!! Do we need another "Silent Spring" authored by Rachel Carson in the 50"s but this new one would be entitled "Silent Oceans" by Who Cares?? I do!! We, the people, have an opportunity to truly be positive shepherds of Planet Ocean upon which all life on Planet Earth is dependent!!

There is a direct link to the sharp decline of *ALL sea life with the introduction of this MONSTER MID WATER TRAWLING TECHNIQUE (MMWTT in the late 1990's).* Everyone involved in the production of sea food acknowledges that all of the fish stocks are in severe decline. That data is available and irrefutable. Let's utilize it in a positive effort.

C. PROTOCOL to determine the effects of the MONSTER MID WATER TRAWLING TECHNIQUE (MMTT)on the health of Fish Stocks

The null hypothesis: The **Monster Mid Water Trawling Technique (MMTT) is a major immediate cause for the decline of all fish stocks in the East Coast fishery**

1. **Immediately** place a moratorium on this technique for three years in the USA.
2. Using available proven methods and valid data, tabulate the stocks now available concentrating on the Sea and River herring, Striper, haddock, Cod, squid.
3. In the interim, ***pass Amendment 5*** in its entirety as currently written.
4. After 3 years of data evaluation the scientific community will be able to define the role of MMTT on the fish stocks. With these data they can then more closely monitor them or ban the technology completely which I advocate.
5. Consult (by means of a scientific questionnaire) with the real fishermen in the field ***initially*** (not after the fact) to evaluate any anecdotal data they will have which can be substantiated by actual scientific testing which will provide some immediate answers or lead the way to further valid research

directed at preserving and enhancing fish stocks into the far future by also studying the micro fauna and flora in the ocean and the estuaries which are the nurturers of all sea life.

I thank you for allowing me to state my position and for allowing transparency to this most important issue which will have immediate (we know them) and long range effects (yet to be determined) on our well being as humankind.

Arthur C. Costonis, PhD.
PO 458
West Chatham,MA 02669

(508) 945 - 3611

LUND'S FISHERIES INCORPORATED
Phone: (609) 884 - 7600 Fax: (609) 884 - 0664 lundsfish@lundsfish.com
997 Ocean Drive, Cape May, New Jersey 08204, U.S.A.

Email to: jreichle@lundsfish.com

RECEIVED
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

April 6, 2012

Capt. Paul J. Howard
Executive Director
50 Water Street, Mill #2
Newburyport, MA 01950
By Email to: comments@nefmc.org

Re: **Comments on Draft Amendment 5**

Dear Captain Howard:

On behalf of the 150 employees of our family-owned business, Lund's Fisheries, Inc., and the independent fishermen who also supply Atlantic herring to our processing facility in Cape May, New Jersey, we thank you for the opportunity to comment on Draft Amendment 5 (A5) to the Fishery Management Plan (FMP) for Atlantic Herring.

We understand that the National Marine Fisheries Service (NMFS) will be publishing a Draft Environmental Impact Statement (DEIS) on A5, on April 20, 2012, and that we will have an additional opportunity to comment on that document, which may be different than the Public Hearing Document (PHD); the source of these comments. We reserve the right to provide additional or amended comments to the Council and NMFS once we have the opportunity to review the DEIS.

Our comments follow the order of issues and options outlined in the PHD:

Sec. 3.1 PROPOSED ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM

Sec. 3.1.1 Regulatory Definitions (Transfer at Sea and Offload)

We support the establishment of regulatory definitions for *transfer at sea* and *offload* as an intent to clarify the regulatory definition of existing fishing operations, including clarifying that pair trawling does not represent a transfer at sea, increase the potential for accurate reporting in the fishery and minimize the potential for catch to be double-counted.

Sec. 3.1.2 Administrative/General Provisions

We support the proposed regulatory change that would clarify that vessels working cooperatively in the herring fishery are subject to the most restrictive possession limit associated with any of the vessels.

The amendment refers to "paired purse seine operations", which is a description that we are not familiar with in the Atlantic herring fishery; traditionally, any purse seine skiff being used to set a purse seine has been considered part of the purse seiner itself and not a "paired vessel."

We support the amendment's intent to make VMS power-down provisions consistent with the multispecies, scallop and surf clam/ocean quahog fleet and allow VMS units to be powered down after the issuance of a Letter of Exemption (LOE), if the vessel is expected to be out of the water or not fishing for an extended period of time.

We support the establishment of a new Federal At-Sea Herring Dealer permit for carrier vessels or other vessels selling Atlantic herring to any entity since the intent is to improve reporting in the fishery. We encourage the agency to ensure that double-counting of landings is minimized through this change.

Sec. 3.1.3 Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea

We support 3.1.3.2 Option 3, which would provide flexibility for herring carriers to either utilize a VMS for declaration, thereby eliminating the minimum seven-day enrollment period and allow for engagement in other activities, or maintain the status quo (minimum seven day enrollment period with LOA restrictions), which would accommodate smaller carrier vessels that do not utilize VMS.

We support 3.1.3.3 Option 1, which would make no changes to current provisions regarding the transfer of fish at sea. It is our understanding that current reporting requirements are adequate to determine and segregate catches and allow for the transfer of herring at sea to vessels without a herring permit, for personal use as bait.

Sec. 3.1.4 Trip Notification Requirements

We support a combination of 3.1.4.2 Option 2 and 3.1.4.3 Option 3, which would expand and standardize current trip notification requirements throughout the herring fishery, as we understand the proposal. We understand that Option 2 would not reach Category D vessels fishing in Area 2 (because the current language stems from that implementing the haddock catch cap) and, therefore, why Option 2 is limited only to fishing for herring with midwater trawl gear. For the purposes of this amendment, however, all areas and gear types should be considered as part of these notification requirements.

Option 3, however, seems to include all fishing activity in Area 2, and in other herring management areas, and require both observer and enforcement notifications regardless of gear type used. It is our understanding that the small mesh bottom trawl fleet can also take river herring as an incidental catch, not only in the Gulf of Maine but also in Area 2 during the winter months, so it only makes sense that all vessels working in the directed herring fishery, whether it be with an A, B, C or D permit, be required to both call for observers before fishing and notify NMFS law enforcement before landing, so that monitoring activities, both at sea and shoreside, can provide the most complete picture of what is being caught and landed in the fishery.

Based upon herring fishery landings and other data that has been reviewed during the development of Amendment 5, our understanding is that the number of Category D vessels that would be regulated under this change, and others proposed in this amendment, would be less than 10% of the number Category D permits issued.

Specifically, Page 6 of the PHD tells us that 2,258 Category D herring permits were issued in 2010 while Table 49, at page 200 of the Council's DEIS tells us that less than 100 of these permit holders landed herring in recent years.

There seems to be a clear need to rationalize the number of Category D herring permits that are being issued by the agency. We strongly support a requirement that all Category D permit holders have VMS on board, when engaged in the directed fishery for herring, and we anticipate that the number of herring Category D permits applied for would likely drop dramatically if this requirement were imposed. We do not see a VMS requirement as a significant economic burden on a vessel today and expect that most of these 100 Category D permitted vessels landing herring may already be required to have VMS on board through other permit requirements.

Sec. 3.1.5 Reporting Requirements for Federally Permitted Herring Dealers

We support 3.1.5.2 Option 2, which would require dealers to accurately weigh all fish, and *Sub-Option 2B*, requiring dealers who do not sort by species to document, for individual landing submissions, how they estimated the relative composition of a mixed catch, to facilitate both quota monitoring, incidental catch analysis and cross-checking with other data sources.

We are opposed to 3.1.5.2, *Sub-Option 2C*, which would require dealers to obtain vessel confirmation of SAFIS transaction records to minimize data entry errors at the first point of sale. This proposal seems to be focused on minimizing discrepancies between vessel hails (an estimate of what is on board) and actual amounts of herring that is purchased by dealers. It places fishermen and dealers in a potentially adversarial, competitive regulatory posture that should be reserved for the Agency, as we understand what is being proposed.

If catch is weighed and sorted after landing, dealer reports should become the primary data source for quota monitoring by the Agency, as we understand to already be the case today. Weighing and sorting will make dealer reports more accurate than they are today and eliminate the need for fishermen and dealers to compare their reports, and put fishermen in a position so that they could be penalized if estimates and actual weights vary, which they will certainly continue to do.

Sec. 3.1.6 Changes to Open Access Permit Provisions for Limited Access Mackerel Vessels in Area 2/3

We support 3.1.6.2 Option 2, which would establish a new open access herring permit for limited access mackerel fishery participants, in Areas 2/3 only, who do not have a limited access herring permit. This permit would be associated with a 20,000 pound possession limit for herring and would assist these vessels by providing a reasonable incidental catch allowance of herring to allow them to be able to fish for mackerel and may reduce discards of herring. This amount equates roughly to the 25,000 pound mackerel incidental catch allowance, provided by the MAFMC for vessels fishing for herring, in all herring management areas, which was established in Amendment 11, the mackerel limited access amendment.

We also urge the Council to begin now to plan for allocating a significant set-aside of Atlantic herring, and explore other options during the upcoming specifications process, such as taking days out of the herring fishery, to facilitate an Atlantic mackerel fishery in the future that is not severely limited by lack of availability of Atlantic herring, as is the case this year.

This year, the expiration of the Area 2 herring quota will keep more than 50 million pounds of mackerel from being harvested, at the same time that herring continue to be widely available in Area 2, according to accounts we have received from vessel captains. Many vessels are tied up today due to this fact and millions of dollars of wasted mackerel quota will not be taken due to the failure of the Agency and the NEFMC to set-aside herring quota for this purpose, as we requested when the current specifications were established.

We estimate that a 10,000 metric ton set-aside may be adequate for this purpose, given the size of the current mackerel quota, and since the herring-to-mackerel mixing ratio can often be as much as 30%. It is our hope that the ongoing assessment will provide an opportunity to return the Area 2 quota to a level exceeding 30,000 metric tons, as has been the case in the past, to facilitate a mackerel fishery in the future.

Sec. 3.2 CATCH MONITORING: AT-SEA

3.2.1 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels

Throughout the development of Amendment 5, we have argued that the herring fishery should not be singled out as being required to pay for excessive levels of observer coverage, beyond what the Agency and Council may prioritize through the SBRM process; a treatment similar to other fisheries managed by the Council.

We have taken this position because we believe that the herring fishery is one of the 'cleanest' fisheries in the region, and that this fact continues to be borne out by the data coming out of both the at-sea observer program and the shoreside monitoring program, a program that we believe should be continued in the region.

We have heard herring PDT members say that there is a limit as to the precision and accuracy of catch data accumulated through the observer program, even if the coverage level were to be at 100%, and have heard members of the scallop PDT state that observer coverage levels of about 30% in that fishery are adequate and that 100% observer coverage is unnecessary to satisfactorily monitor the scallop fishery, another regional fishery that we are active in.

Even so, we and the majority of other Category A-permitted herring vessels owners are willing to support observer coverage levels of 100 per cent in the herring fishery, for a limited period of time, because we remain convinced that the data will continue to show that incidental catches in this fishery are not of significant biological concern to haddock, shad, river herring or any other regional fishery stocks. We are taking this position as a challenge to our detractors, who so far have shown no interest in the actual data coming from current monitoring programs and who continue to make unsubstantiated claims about how the herring fishery operates. We will take observers at a 100% rate to continue to demonstrate that the herring fishery is a responsible fishery.

We take this position with a couple of caveats, however. First, we do not support maintaining 100% observer coverage levels in the herring fishery forever since we do not believe this coverage rate is necessary and because the expense can be significant. We suggest that a 100% requirement be temporary and only last two years, after which time the PDT should be tasked to analyze the data and report to the Council as to whether or not this level of coverage is necessary to adequately monitor the herring fishery in the future.

Second, we are only willing to purchase observer coverage, beyond those levels that may be allocated through the SBRM process and up to 100%, if the daily cost can equate to the $325 a day rate paid by the West Coast H&G fleet, a fleet whose observer coverage rates have been suggested as a model for the herring fishery during the development of Amendment 5 by those who argue that we are under regulated and operating unsustainably. We are opposed to paying the $1200 a day rate calculated by the observer program since this represents a cost that would not be sustainable in the low value Atlantic herring fishery.

Third, we only support a temporary, 100% observer program in the herring fishery if the program would authorize the Agency to provide a vessel with a waiver if a Federal observer, or an observer from an approved observer service provider, is not available for a particular trip. We simply cannot afford to have our vessels tied up if an observer is not available to us for some reason and we are willing to both take and pay for an observer on that trip.

Sec. 3.2.2 Management Measures to Improve/Maximize Sampling At-Sea

We support the addition of the provisions listed in Sec. 3.2.2.2, which are intended to improve sampling by observers at-sea and we understand that many of these provisions are already in place; these include requirements for a safe sampling station, requirements for 'Reasonable Assistance', requirements to provide notice, requirements for trips with multiple vessels, improving communication on pair trawl vessels and providing visual access to the net and codend. It is our understanding that the relationship between the Federal observers that have been on our vessels over the past few years and our fishing captains is excellent and we have attempted to cooperate with every request made to us by the observer program throughout this period of time.

Sec. 3.2.3 Measures to Address Net Slippage

We support Sec. 3.2.3.2 Option 2 requiring the use of a released catch affidavit for 'slippage events' and understand that these affidavits are already in use, with the support of vessel owners and captains.

We are opposed, however, to the continued application of the Closed Area 1 Sampling Provisions (Sec. 3.2.3.3), either within Closed Area 1 or elsewhere, because of the requirement that all fish be brought on board for sampling and inspection by the observer. As we have repeatedly pointed out during the development of Amendment 5 there are significant operational restrictions that make it impossible, or dangerous, to bring the pump and codend or brailer over the rail during fishing activities on midwater trawl fishing vessels. Our captains tell us that the observers have no problem seeing what remains in the net after pumping, while the net remains alongside the vessel and, as we indicate above, our captains have no problem providing visual access to the net and codend so that the observer can do his or her job.

We are strongly opposed, however, to all of the options listed in Sec. 3.2.3.4, Options 4A through 4D (proposing catch reduction and trip termination), as being simply punitive in nature and not being constructive to the ongoing cooperation between our captains and the observers on our vessels. In addition, we urge the Council and the Agency to repeal the Closed Area I regulations since there is no indication that incidental catches in Closed Area I differ significantly from those in other areas where the herring fishery operates and due to the fact that there is no data to indicate that the herring fishery is having any significant mortality effect on any groundfish species, either inside or outside of Closed Area I.

It is important, however, to retain in regulation that fish can be released throughout the herring fishery if the vessel operator finds that:

1. Pumping the catch could compromise the safety of the vessel;
2. Mechanical failure precludes bringing some or all of the catch aboard the vessel; or
3. Spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.

Finally, as we all know, the Council's habitat and groundfish committees are moving towards either eliminating Closed Area I or modifying the area due to its lack of relevance today as either a groundfish protection or habitat protection area, making regulations specific to the area equally irrelevant to managing the herring fishery today or in the future.

Sec. 3.2.4 Maximized Retention Alternative (Experimental Fishery)

We support Sec. 3.2.4.1, the no action alternative. Herring vessels would continue to operate under the regulations and possession limits for any fisheries for which they possess permits. Amendment 5 would add other regulatory changes, which we could support consistent with our comments, and would aid observers in their responsibility to see and sample catches.

The herring fishery has taken place in this region for more than 100 years and was the first fishery to agree to hard quotas, more than a decade ago, with the approval of the Federal FMP by the Council and Agency, in 2001. The idea that the herring fishery should be operated as an experimental fishery has been suggested by advocates who clearly would like to eliminate the majority of the fishery and the vessels in it. This proposal only has punitive value and should be summarily rejected by the Council.

Sec. 3.3 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

Sec. 3.3.2 River Herring Monitoring/Avoidance

The public hearing document tells us that the long-term goal of this section of the proposed amendment is to adopt river herring bycatch avoidance strategies in the time and areas where interactions with the herring fishery are observed or anticipated.

At the same time, the Magnuson-Stevens Fishery Conservation and Management Act's National Standard Nine requires that "*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.*" National Standard One requires that "*conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the United States fishing industry.*" The Atlantic herring fishery is not considered overfished, nor is overfishing occurring, so maintaining OY in the fishery must be a Council priority.

We agree with the amendment's goal, since it has now become clear to us that minimizing the incidental catch of alosine species has recently become both a public and a Council interest and we recognize our duty under the law to reduce the incidental catch of these fish.

As this amendment has developed over the last few years, however, we have come to the realization that most of the river herring monitoring and avoidance strategies proposed by the Council in the amendment do not recognize the temporal and spatial variations dictating where river herring will be from year to year, or even from day to day, and that the extensive areas that are proposed to be closed threaten our ability to continue to catch herring, either to provide an important baitfish for the region's lobster and crab fisheries or to export high quality, nutritional herring for human consumption when international markets are available to us under favorable terms.

Consequently, during the past two years, we have been working with other boat owners, organized as the Sustainable Fisheries Coalition (SFC), and in partnership with the Massachusetts Division of Marine Fisheries (DMF) and the UMASS Dartmouth School of Marine Science and Technology (SMAST), to replicate a bycatch avoidance project already in use in the scallop fishery, to reduce the incidental catch of yellowtail flounder; an approach recognized as effective by this Council.

Our project, funded for the past two years through the National Fish and Wildlife Foundation, and with recent financial support from the Nature Conservancy to allow for the participation in the project by small mesh bottom trawl fishermen, is already working to create awareness of the issue within the fleet and direct effort away from where river herring species are known to be on a daily, real time basis. At this time, we are seeking additional funding through the MAFMC RSA program, so that this low cost, real time program can continue into the next fishing year. This program includes a goal of monitoring 50% of trips that are landed, so that incidental catches can be identified and quantified.

Within this context, we support Sec. 3.3.2.2.4 Option 4, a two-phase bycatch avoidance approach based on the SFC/SMAST/DMF project, as the only option that will work to reduce the incidental catch of river herring in the herring fishery and allow for the continued production of optimum yield from the Atlantic herring resource. The project should involve all vessels directing on Atlantic herring, including Category A, B, C and D permit holders. VMS is essential to the success of this project and therefore, all Category D permitted vessels directing on Atlantic herring should be required to have VMS on board.

Sec. 3.3.5 River Herring Catch Caps

We do not support the Council considering a biologically-based river herring catch cap through a framework adjustment to the herring FMP or the herring specifications process with this amendment. It is our understanding that the PDT has not made a recommendation for a catch cap because there is insufficient information upon which to base one. The relative mortality effects of incidental catches in the herring fishing, and would be critically important to understand before setting a biologically-based catch cap.

Sec. 3.4 MANAGEMENT MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

As stated above, we believe that there is no relationship between incidental catches in the Atlantic herring fishery and the groundfish closed areas. The GFCAI provisions (CFR §648.80) should be repealed upon implementation of this amendment for this reason and access to the groundfish closed areas should be retained for both herring midwater trawlers and purse seiners, through a LOA issued by the agency, as had been the case for many years.

In response to a previous legal challenge to midwater trawlers' rational access to GFCAI and other mortality closures, in a brief to a Federal court in June 2009, Agency attorneys wrote, "*even if bycatch in the herring fishery (was) hundreds of times the level suggested by the data, then there would be no compelling reason to suspect that haddock or other groundfish stocks (are) imperiled.*" The Agency also clarified in its brief that, "*by contrast, the directed groundfish fishery's total allowable catch of haddock is...500 times the (existing) herring bycatch cap*" and "*for those stocks that are undergoing overfishing, the bycatch in the herring fishery is so miniscule that the measures sought (evicting herring vessels) could not prevent overfishing of these stocks.*"

In conclusion we strongly support Sec. 3.4.1 *Alternative 2 – Pre-Closed Area I provisions*, which would reestablish criteria for midwater trawl vessel access to the groundfish closed areas based on provisions prior to the implementation of the Closed Area I rule.

Thank you for your attention to and your consideration of our comments. We look forward to continuing to work with you and the members of the Council towards the implementation of reasonable, additional monitoring requirements in the Atlantic herring fishery, through the implementation of Amendment 5, to ensure a sustainable Atlantic herring resource and fishery for many years into the future.

With best regards,

Jeff Reichle

Jeffrey B. Reichle
President

Mr. Paul Howard
New England Fishery Management Council
50 Water Street
Newburyport, MA 01550

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

March 27, 2012

Mr. Howard:

We the undersigned representing the traditional single boat bottom trawl Herring Fishery, offer the following comments on Amendment 5 to the Atlantic Herring FMP.

3.1.5 Management Measurers-FMP Adjustments

Option 2 Require Dealers to accurately weigh all fish

The majority of Herring landed are pumped out of vessels into tanker trucks or vat, (tub) trucks. Water is necessary to pump fish and will always vary in amount depending on many variables . Simply weighing a truck empty and then full will not provide an accurate fish weight.

The Council and NMFS should accept the calculation used by dealers and processing plants to determine weight of fish purchased. Regardless of type or size of trucks, a calculation from pounds to dollars is applied. i.e. 22 vat truck at 1800 lbs. per vat equals 39,600 lbs.

Processing plants and bait distributers randomly after removing water, weigh any number of vats on each truck and average the weight to calculate weight of fish being purchased.

Once there is acceptance to the above calculation then sub-option 2C becomes the next required action.

We do not support increasing the frequency of VTR and Dealer Reports.
The new requirement implemented in late 2012 requires all vessels to electrically report Herring catches and discards by area the day the fish are caught. This new reporting requirement should be sufficient to maintain weekly VTR and Dealer Report submissions. This new law was not yet in effect when Amend 5 document was created.

3.2.1 Catch Monitoring at Sea

The Pate/Touchtone Report clearly states that management actions implemented by the council and the agency have lacked sufficient review as to their effectiveness, and intended or unintended results.

Considering that beginning with the development of Amend 4 to the Herring FMP in 2008 the level both at sea observer coverage and dockside monitoring Increased significantly for the Herring fishery, we recommend that the Herring Committee and the Council request the Herring P.D.T. to do a technical analysis on a vessel by vessel basis to determine the performance of each vessel in the fishery. We believe that the number of observed trips and the level of dockside monitoring combined with improved species identification protocols will provide data that would be superior to earlier years of observations and better determination of how the fishery currently performs.

Our rational for this analysis would be to provide current, accurate data that would be used in the decision making process for Amend. 5.

From personal experience over many years of fishing we are confident that the Herring Fishery is the second cleanest fishery in New England behind only the lobster fishery.

It is our belief that significant by catch events occur NOT across the fleet, but with only a small number of vessels and often times the same vessels.

We suggest that the Council and the Agency utilize this analysis to provide an incentive to the fleet to fish responsively and recognize those that consistently perform well with a level of observer coverage that meets the NEFSC recommended coverage.

Those vessels that have been identified with higher and more frequent by catch interactions would be required a higher level of Observer coverage until such time that they can demonstrate reduced by catch interactions.

3.3.2.2.4 River Herring Monitoring/ Avoidance

We support Alternative 2-Option 4

Rational-This winters mild conditions and above average sea temperature would have resulted in all options in AMED 5 with monitoring /avoidance areas missing the mark by 1,000%. The only way to have a successful by-catch avoidance program is in real time. This seasons MADMF and SMAST Program will provide data to support long term by catch avoidance strategies in real time that can be extremely effective.

OTHER RECOMMENDATIONS

1- Separate by catch data prior to amendment 4 by increasing the threshold for directed herring trips from 1,000lbs. to 10,000 lbs (minimum) .

   The current threshold of 1,000 lbs. does not differentiate between a mixed small mesh trip and a directed herring trip.

2. Require observers on directed herring trips to ask the Captain before sailing if there are any herring aboard and how many.

   Rational-Herring that have been reported and landed, then taken back to sea to be discarded would have an explanation for discarding. i.e. poor quality, size, no market for sale.
   It should be noted that herring vessels may take fish back to sea if trucks for off loading are not available when needed. As trucks become available, the fish carried over as well additional fish would be off-loaded.

Signature:	Print Name:	Address:
Steve O Folkett	Steve Folkett Fv Heather Lynn	165 Thoreau lane whidbey island WA 98278
Scott Babcock	Scott Babcock	LOIS VIRGINIA
Perry Beno	Perry Beno	Lois Virginia
Scott Babcock Jr	Scott Babcock Jr	Lois Virginia
[illegible]	[illegible]	[illegible]
Neil Robertson	Neil Robertson	RJ Engine
Daniel Tabor	Daniel Tabor	RE Engine
Mary C O'Rourke	Mary C Rourke	TRAWLWORKS
Steve Tabor	Steve Tabor	Trawlworks
[illegible]	Jim CORDICE	TRAWLWORK
[illegible]	PETER KLENK	TRAWLWORKS
[illegible]	RICHARD BOITEAU	TRAWLWORKS
[illegible]	[illegible]	[illegible]
[illegible]	Andrew C. Folkett	Heather Lynn
[illegible]	Mark Balstei	Heather Lynn
[illegible]	Heather Folkett	Andrew + Steven
[illegible]	[illegible]	[illegible]
[illegible]	KEVIN Jones	Heather lynn
[illegible]	[illegible]	Heather lynn
Danny McCalley	DANNY MCCALLEY	FV CHALLENGER
[illegible]	FELIX E GILL	15 Willow Ave 02554

Signature:	Print Name:	Address:
Robert Westcott	ROBERT WESTCOTT	POINT JUDITH, R.I. 02882
Glenn Westcott	GLENN WESTCOTT	Point Judith, R.I. 02882
	Joshua Westcott	Point Judith, RI 02882
	Nicholas Westcott	Point Judith, R.I. 02882
	THOMAS MITCHELL	POINT JUDITH, R.I. 02882
	Jonathan Knight	Wakefield RI, 02879
	BARRY KNAPP	710 CROWELL MILL RD.
	LOUISE MORRIS	17 Rockwood Dr RI 02879
Rebecca J Monahan	Rebecca Monahon	West Kingston, RI 02892
	Fred Matteri	113 Lewiston Ave, W Kingston, RI 02892
	DONALD HOULE	THE BAIT CO.
	Michael Hall	Town Dock
	Timothy Carroll	22 Harcourt Ave Wakefield RI
	Donald D. Fox	615 South Road Wakefield RI 02879
	Shaun Champlin	18 Leicester Ave Narragansett RI 02882
	DEBORAH CHAMPLIN	556 Pt Judith Rd Narragansett RI 02882
	PAUL CHAMPLIN	556 Pt Judith Road, Narra, RI 02882
	Robert Hubbard	811 Ocean Rd Narr RI 02882
Robert R Ferraro	Robert R. FERRARO	55 Lambert ST. NARRA RI 02882
	Robert R Ferraro JR	255 Old North Rd Kingston RI 02881
	JANICE C SEVEGNY	119 Fedderick Farm Rd NARRA RI
	Joseph A. Murphy	2 Stevenson Way Narra, RI 02882
	Philip Ruhle Jr	28 Serenity Way Peacedale RI
	JUDITH A. FREDERICKSON ESQ.	66 MAIN ST #3 WAKEFIELD RI
MARIA J. MALLEY ESQ	MARIA J. MALLEY	#5 30 Sweetmeadows Narragansett, RI
	Jerry Sullivan	86 Conch Rd, Narragansett, RI
	JAMES HAGUE	35 WOODWARD AVE NARRA RI
	[illegible]	[illegible]

Joan O'Leary

From: Chris Lish <lishchris@yahoo.com>
Sent: Sunday, April 08, 2012 11:32 AM
To: comments
Subject: Comments on Draft Amendment 5

Sunday, April 8, 2012

Paul J. Howard, Executive Director

50 Water Street, Mill #2

Newburyport, MA 01950

Subject: Comments on Draft Amendment 5

Dear Capt. Howard, New England Fishery Management Council,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem. Over four years ago, the public called for--and the New England Fishery Management Council (NEFMC) committed to--improving the management of industrial fishing in New England. Now, after several years of deliberation and tens of thousands of public comments, it's time to deliver on that promise of reform.

> "As we peer into society's future, we--you and I, and our government--must avoid the impulse to live only for today, plundering for our own ease and convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow."
>
> -- Dwight D. Eisenhower

I am especially concerned about populations of river herring, which have declined by 99 percent and are so depleted that Atlantic seaboard states are forced to close traditional fisheries and deprive recreational anglers and the public of this important resource. Most Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait and the NMFS is now considering listing river herring under the Endangered Species Act. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch in the industrial fishery

targeting a different species, Atlantic herring.

> "For in my experience it seems well-nigh impossible to obtain a hearing on behalf of Nature from any other standpoint than that of human use."
>
> -- John Muir

Since the initiation of Amendment 5, these problems have continued to get worse. The National Marine Fisheries Service (NMFS) has repeatedly proven unable to enforce Atlantic herring quotas, the first step in fishery management, due to inadequate catch monitoring. In addition, the practice of slipping catch at sea continues to undermine efforts to identify and record everything that is caught by herring vessels. Alarming interactions with groundfish also continue, as midwater trawl fishermen recently demanded and received a five-fold increase in their haddock bycatch allowance.

> "Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method."
>
> -- Theodore Roosevelt

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

> "Only after the last tree has been cut down, only after the last river has been poisoned, only after the last fish has been caught, only then will you realize that money cannot be eaten."
>
> -- The Cree People

Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns. Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet. I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

- A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
- 100 percent at-sea monitoring on all mid-water trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
- An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleet-wide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
- A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

"Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish--indeed, all the living creatures of prairie and woodland and seashore--from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement."

-- Theodore Roosevelt

I urge you, as trustees of our nation's marine resources, to fulfill your duty to conserve and manage these resources sustainably by approving this long-awaited revision without further delay.

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

-- Aldo Leopold

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,

Christopher Lish

Olema, CA

RECEIVED
APR 6 2017
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Comments from Norpel an American company on Amendment 5

Having attended the public comment sessions at Fairhaven Massachusetts and Warwick Rhode Island I was appalled at the audience comments. Comments included "foreign boats fishing"," pair trawling catching everything in their path including whales seals and dolphins"," catching all the groundfish", "over fishing"," the reason the River Herring declined"," smoking guns etc." This is a result of PEW propaganda started before Amendment 1 and has continued to date. PEW through numerous organizations CHOIR, CCHFA, CLF, the Herring Alliance and Midcoast Fishermen's Association to name a few, have avoided the facts generate by government and state agencies generating hatred for mid-watering and advocating racial discrimination. I haven't heard one coherent argument from PEW that warrants 100% observer coverage.

Mid-water fishing is described as a small mesh fishery by NMFS and NEFMC. This is very misleading because a mid-water net has 15 to 20 foot mesh at the mouth and back the net until we get to the next sheet. Each sheet back the net halves the mesh size until we get to four inch mesh at the back of the net. The brailler is attached to this part of the net which has two inch mesh to hold the fish the net guided back to it. The opening in the brailler is less than 100 square feet and usually less than 60 square feet hardly the size of a football field regardless of net size. A groundfish net has only 6 inch mesh at the mouth by comparison. Because the mid-water net has such large mesh at the mouth Ground fish with the will not recognize the twine pattern and will not be guided to the Brailler.

Haddock are defined as a groundfish by NMFS and NEFMC. This is very misleading because people now believe haddock to be on the bottom. Haddock are rarely if ever on the bottom and could better be described as a Mezzanine fish (up off the ground floor). For haddock to get caught by a mid-water net they need to be swimming in line with the direction of the tow and in the middle of the net so that they get back to where the 12" mesh is. This mesh can then guide them to the brailler. If the fish swim off line to the tow, they will swim out through the big mesh. The observer data from 2010 can attest to this in that there were three large incidences and a fourth would have closed the fishery. The overabundance of Haddock and their behavior I described resulted in this anomaly.

Demanding 100% observer coverage where industry pays for it, is spiteful and intended to bankrupt the industry. Unlike the public NEFMC, I would hope, would look at observer data, dockside data and see if 100% coverage is warranted. PEW and their minions can lie and slander themselves at public comment, generate hatred and racism. I would hope council, having the facts available to them that show the fishery to be the cleanest fishery with respect to by catch (with the exception of lobster fishing) can view 100% observer coverage as needless and cost burdensome.

100% observer coverage will eliminate the smaller boats in the directed herring fishery and the larger boat will initially absorb the cost which will in turn be passed on to the end user: the lobster fisherman primarily. After Amendment 1 came in in 2006, there were 6 plants freezing Herring for food in New England, The Atlantic Frost, Marrs, Dumstine, Stinson, Cape Seafoods and Norpel. The latter two survived Amendment 1. There were 15 boats full time herring fishing with category A permits when Amendment 1 came to pass. Now there are only nine due to bankruptcies caused by gear restrictions

and unrealistic catch caps. Norpel had three designated herring boats and for financial reasons caused by gear restrictions and unrealistic haddock catch caps, had to stop fishing them.

Norpel and Cape Seafoods freeze herring for food consumption primarily and ship this food to Africa and South America. The people who eat our product in these countries are the poorest in these countries and this is the cheapest protein they can afford. Norpel is 100% American owned and operated. It operates under federal and state regulations. It abides by FDA, Massachusetts department of Health, EPA, DEM, NMFS, NOAA, OSHA, ICE, IRS and Homeland Security to name but a few state and federal organizations. The company employs up to 70 people withholding taxes for state and federal government as well as paying taxes. We have to adhere to minimum wage laws and under these burdens can operate competitively in a world market. This should be commended when many American companies are floundering with high operating cost and higher energy cost. Instead, we are vilified by PEW minions in public comments like "too efficient industrial trawlers". Norpel cannot pass on the cost of 100% observer coverage to these poor people, all we will do is price ourselves out of the market and go bankrupt.

If NEFMC insists 100% observer coverage necessary it employs Massachusetts Department of Fisheries (Paul Dodoti), the federal observer program, Massachusetts DEM, NMFS, NOAA enforcement and the USCG are not doing their job. This requires that NEFMC recommend to NMFS and the Secretary of Commerce for a forensic investigation as to why they would allow a fishery to catch everything in their path with such oversight. My feeling is PEW has bought and paid for seats on the NEFMC as a vote for 100% coverage would suggest.

River herring declined dramatically 40 years ago. Mid-watering for herring didn't start until the late 90's and realistically until after 2001. There has been no appreciable increase or decrease in the river population since then. EDF sponsored a study of the river herring hot spots which indicated just about all of New England waters. This would mean banning herring fishing with mid-water (small mesh) net in New England waters in the winter months. After the discrimination of gear type Amendment 1 instituted, it is unlikely PEW minions can sell this "snake oil" again.

Option 4 is a real time avoidance program and promises the best possibility of river herring avoidance going forward. Because the mid-water boats didn't get rid of the river herring, getting rid of the mid-water boats cannot possible bring them back.

Slippage is a term all too familiar to CHOIR. It is where a tuna boat catches one fish, remain fishing and if they catch a second, they then slip the least valuable over the side to comply with the law. This term has then been manifested on mid-water fishing. The only reason a mid-water herring boat would slip or trip a bag of fish is (1) If he cannot pump them aboard due to dog fish in them

(2) Mechanical difficulty or compromising the stability of the boat whereby the observer, crew or boat maybe jeopardized.

Any restriction more than having the skipper sign an affidavit explaining his action would be vindictive and capricious.

Sincerely

Eoin Rochford

Plant manager Norpel

Town of Wellfleet

Shellfish Advisory Board ~ Natural Resources Advisory Board

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

April 5, 2012
Paul J. Howard - Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Re: Comments on Draft Amendment 5

Dear Mr. Howard,

We're writing to commend the New England Fishery Management Council for taking some bold steps in the form of draft Amendment 5 to address issues regarding the monitoring, and regulating of the mid-water fishery for Atlantic Herring.

In Wellfleet, we've observed a steady decline in our inshore fish populations, which we believe has occurred in large part due to overfishing at the bottom of the food chain. Atlantic Herring, River Herring, Menhaden, Mackerel and various other well known forage species make up the bulk of the forage base for those fish higher up the food chain inhabiting our waters. These predators and prey provide recreational and commercial fishing opportunities that draw tourists and fishermen to our area in pursuit of them. A robust inshore fishery drives a healthy local economy for which all of our residents are highly dependent upon.

River Herring have a storied history throughout coastal New England. Unfortunately, for the past 7 years a ban on their possession has been in effect for much of the Atlantic seaboard due to a collapse in their population. Since 2009, we've been documenting river herring as they ascend the Herring River through a well coordinated effort of local volunteers. Observed numbers have steadily declined each year. Despite these facts, large mid-water trawlers often catch more river herring in one tow as bycatch than we see in our Wellfleet run in an entire year. This depletion of a common resource must stop now.

In response to your request for comments on the draft amendment, we note that there are many references to monitoring bycatch, and to eliminating to the extent possible the wasteful practice of dumping (slippage). Accordingly, we request the following be included in the final document:

- 100% observer coverage ***(Section 3.2.1 Alternative 2)*** on every mid-water trawl boat in the herring fishery to assure accurate accounting of all bycatch and slippage.
- Immediate implementation of a river herring catch cap based on recent catch, until a biologically based limit can be established (***Section 3.3.5, modified to require immediate implementation***).
- A system to discourage wasteful dumping of catch ***(Section 3.2.3.4 Option 4D)***, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port.
- No mid-water trawling for herring in areas closed to groundfishing ***(section 3.4.4 Alternative 5).***
- Acknowledgement that Atlantic Herring provide key ecological functions, and will be managed accordingly.
- Assurance that the ecological services, and ecosystem benefits provided by Atlantic herring and river herring will be considered as taking priority over any commercial interests when determining future management strategies.

Thank you for considering our comments. We appreciate the immense amount of work that has gone into preparing this draft document. We're hopeful that fisheries managers will continue to embrace a sensible, ecosystem based approach to fisheries management - to the ultimate benefit of our local fish populations, and all those groups dependent upon them.

Sincerely,

John Duane, on behalf of:

Town of Wellfleet Natural Resources Advisory Board:
John Riehl, John Duane, Ned Hitchcock

Town of Wellfleet Shellfish Advisory Board:
Barbara Austin, Barbara Brennessel, John Duane, Joel Fox
James O'Connell, Rebecca Taylor, Helen Miranda Wilson

I would like to take this opportunity to comment on the different proposals in amendment 5

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

To address the issues in amendment 5, I want to first point out that PEW Charitable Trust, through different organizations has launched a multimillion dollar campaign against mid water fishing for Herring in New England waters. As a former fisherman and processer, my expertise is in catching and processing fish and not in Legislation, Media manipulation and Political manipulation.

When amendment 1 went in to effect in 2006, the fishing industry had 30 days to sue NMFS for the discrimination of gear type and if not it could not be revisited. While we were considering what were our alternatives the deadline passed and the decision was a moot point.

We felt that we could survive fishing on Georges Bank , which is area 3. The Haddock population on Georges was enormous at this time. An interesting think about Haddock is even though the NMFS and the NEFMC call Haddock ground fish they are seldom if ever on the ground. The net that effectively catches Haddock is a high rise bottom net where the head rope slightly leads the foot rope. The reason for this is the fish are off the bottom 1 to 2 fathom typically and they can detect the foot rope of the net coming along the bottom to catch them. So they try to swim ahead of it but tire quickly because they are poor swimmers and swim up in the water column. This is why the head rope has to lead the foot rope slightly (to prevent them escaping over the top of the net) so they can now be caught by the net.

Now let us look at a mid-water net and how this fishes. The mid water nets are considered and discussed in public and at council as a small mesh fishery. Again this is very misleading. A herring mid water net has minimum 15 foot mesh size at the mouth some have even bigger mesh 21 foot.

Each sheet back the net the mesh size halves until we get to the brailler at the back of the net which has 2 inch mesh to retain the fish caught by the net. PEW and their minions keep telling the public about the 2" mesh and never mention the 15' or 21' mesh at the front of the net. Regardless of how big the net is the brailler opening is less the 100 square feet and usually less than 60 square feet.

The reason the net catches herring is very interesting. The schooling nature of the fish is critical to fishing with these big meshes. If one watches schooling fish swim they appear to swim randomly but all turn in unison without bumping into one another. 2 or 3 decades ago a marine biologist explained to me that schooling fish can sense the fish next to it by the vibrations in the water.

When the mid water net is towed it is like towing a very leaky funnel. However the twine vibrated as it is being towed and some of the fish get funneled to the brailler at the back. To catch a haddock who do not recognize this big twine pattern the fish need to be exactly swimming in the middle of the water and are aligned with the direction the net is being towed so they can get back were the mesh is small enough to catch them.

If they swim any little bit off line to the direction of the tow they will swim out through the big mesh at the front of the net. In 2010 there were three large random incidences in about 100 tows. One more incidence would have closed the herring fishery for everyone including seiners until May of 2011. So

industry got together and decided not to pursue any more herring in area 3 where there were vast quantities of haddock. NMFS and council were asked to address and unreasonably low Haddock quota based on their biomass. Industry was again ignored even though any normal individual analyzing the facts would agree it to be a reasonable request. That year the observers were carried at 85% of the time on the mid-water boats going to Area3.

When Demersal fish (with the exception of haddock who are too high in the water column) come into the mouth of a mid-water net assuming they go over the foot rope there is no reason why they would go back to the brailler since the bottom sheet behind the foot rope elevates at about 12 degrees from the horizontal so there is no guidance to get them to the brailler hence the very low level of by catch in the observer data. The mid water nets are expensive to build and to tow because the drag resistance in the water. If the mesh were smaller they would be more expensive to build and harder to tow resulting in a far greater fuel bill.

Fuel for a mid-water boat is usually between 800 and 1200 gallons per day or $3200 to $5000 per day for the bigger boats. Fishing in area 1A before 2006 a boat could get to the fishing grounds and back every day keeping fuel expenses to a minimum. When the boats were forced to go to Area 3 to fish there was one day to the grounds one day back and one to two days fishing at a cost of $12,000 to $20,000 just in fuel. So from a commercial point of view let us look at how much fish requires to pay the fuel bill. At $0.10 per lb. 200,000 lbs. of fish or 133,000 lbs. @ $0.15 per lb.

Commercial fishing requires you make money so the cost to fish cannot be greater than the value of the fish caught or if it is for any period of time the cost exceeds the catch the fisherman goes bankrupt. Sport fishing does not have this fiscal burden to deal with.

The argument is made that these huge boats with enormous nets can catch every fish in their path and I feel I have described why the net cannot do this and the cost to fish mid watering is so great if there isn't an overabundance of the target species (Herring) the boats cannot afford to go fishing. The way these boats fish is they find the fish in a dense enough school to fish on their sounders and sonar and then shoot the net towing until they get a sensor or two to trigger or else they haul back and look again. They cannot afford to tow and dump fish as the NGO's are saying.

These boats are burning maybe 50 gals. of fuel steaming but this figure increases to 80 or 90 gals. per hour for the tow period. To fish effectively you first find a dense enough concentration of fish so your tow time is minimized and make a profit.

In 2008 or 2009 a Michael Fogarthy from the fish science center in Woods Hole made a presentation to the NEFMC explaining that the overabundance of Herring in Georges Banks directly impacted the Right Whale population in the area (by eating too much of the zoo plankton in the water so the whales had to find another area with greater density of plankton) and indirectly impacted the Cod fish recovery because of the Herring carnivorous habits devouring Cod larvae.

The Cod roe hatches and the hatchlings are called larvae and their only food source is the chloro plankton in the top few feet of the water column. When there is an overabundance of herring in the

area they feast on these Cod larvae and we then get a poor recruitment of Cod. No sooner had Dr Fogarthy finished his presentation to the council the herring quota was cut "on a precautionary measure". The study did take place on Georges over a number of years. Recently the Cod fish in the GOM is deemed in trouble from over fishing. The most logical answer to the collapse of the cod fish in the GOM is probably in Fogarthy's study on the overabundance of Herring but again the council due to political pressure or selective amnesia didn't even consider this.

The herring in New England Waters has small size and low body fat for age and year class because they are too many fish for the food source in the area. This is documented fact so my understanding is other species in the eco system have to suffer eg the Cod fish in the GOM.

To regulate a fishery correctly you need to understand how it is operated and the natural driving habits of the fishery. Bait is the main driving force in the Herring fishery. Food quality fish is the secondary one. Stinson seafood in Maine was a food processor for over 100 years and was put out of business by amendment 1.

A seine boat can catch 1000 ton in a single set when the fish are behaving correctly and nothing when they are not. Mid water fishing for herring started in the 1990's because it was more consistent at catching fish even though it couldn't catch as much as a seiner. The market was primarily bait but Stinson soon realized that mid-water boats didn't catch a lot but would catch fairly consistently. Soon the bigger seiners changed to mid-watering to ensure they kept their market. Seiners require carriers because when they do catch they cannot possible hold the huge quantity of fish they catch.

Herring gorge themselves on krill April to June and the fish have their stomachs distended and extremely high enzymes in them. The fish tend to blow open their bellies in the RSW tank and the smaller fish break down in the water as if being digested. These fish have very limited market value and are use as bait. Few if any boats fish at this time of the year because limited ability to sell this poor quality of fish.

During July, August and September the Bait market in Maine buys most of the fish. August and September we can buy excess fish that the bait market will not absorb. In area 1A the states have certain landing days that the boats can land. This causes a race to fish when the mid-water boats are allowed to fish in the middle of October. They go out a few days before the landing days to ensure they fill up and the end result is the fish are only suitable for bait due to age.

Area 3 fish cannot safely be caught after November because of inclement weather. The fiscal responsibility on the skipper to make the trip pay isn't worth the risk of the trip. Most years the boats cannot fish November or December because the fish are usually not in Area 2 and the quota is caught in 1A and 1B. The boats are realistically fishing about 7 months of the year. Herring are not sedentary like scallops they migrate from the GOM and George to area 2 which is southern New England water in the winter normally. This year a large body of fish stayed in the GOM all winter because of unusually warm conditions. In the spring the fish normally migrate to the GOM and Georges.

Since Herring amendment 1 went into effect in 2006 there were 15 boats mid-watering in the New England states primarily fishing for herring most of the year. There are only 9 left actively fishing primarily for Herring. There were 6 plants that bought and process Herring and now there are 2 left operating. I clearly remember reading amendment 1 would have no appreciable effect on the community. I can assure council I witnessed millions of dollars being lost by the boats being bankrupted and plant not get a steady supply of fish. The communities that worked in these plants also lost their incomes. The question I have to ask is

Is the Herring stock more or less robust as a result of amendment 1?

Is the community better off as a result of amendment 1?

The cutting the Herring quota on the precautionary measure would suggest NO to the first question.

Seeing the depletion of boats in the directed fishery, the lack of competitors buying the fish and the number of bankruptcies. The communities are being economically devastated by this.

The reason it was such a failure is it was driven by a multimillion dollar campaign funded by PEW through Cape Cod Hook and Line, the Conservation Law Foundation, Earth Justice and the Herring Alliance etc. These people had no vested interested in Herring fishing yet they convinced everyone we were the greatest evil on New England waters manipulating facts, political contributions and controlling the New England Management council.

I read an article in the Harvard Business Review about these tax free charitable organizations. It stated that when they were founded they had great aspirations and did some good but now they exist just to exist. I cannot say I agree with the last part when I witnessed the destruction they have perpetrated in New England fisheries.

When Amendment 5 was being developed the PEW minions proposed several different scenarios all of which would put tremendous financial pressure on the boats bankrupting some, so we would then have less boats getting more of the resource. When less people have the resource the community gets less benefit from the resource.

PEW have developed their own science making Herring the main food source for all species in the New England Waters coming up with the catch phrases fodder species, local depletion, industrial trawlers and net slippage almost like a game show. This is not a game show and people have invested lot money creating numerous jobs in an underutilized fishery on NMFS recommendations.

The proposal to carry 100% observer coverage is not a problem for us so long as the government or PEW pays 100% of it. The cost to the smaller boats that carry 40 or 60 tons would bankrupt them or force them out of the fishery. Sometimes the boats go to Georges and do a broker (not catch enough fish to cover their expenses) and if they had to pay for an observer this would make it impossible to pursue the fishery. This is not scalloping where the product off the boat is worth $10 per lb. as this fish is worth

between $0.07 per lb. and $0.15 per lb. The recreational fishermen keep reiterating at the meetings the fishing is modified when an observer is aboard. This is not financially viable because of the cost of doing a trip is so great we have to stay focused on being profitable so it isn't reasonable to assume you can modify your fishing habits when you have an observer 85% of the time on Georges because of the possibility of towing in the ground fish closed area. The shore side observer data can attest to this statement.

When a Herring boat leaves to go on a fishing trip on Georges because of the present rule - having to have an observer to fish in the GFCA - he has to take an observer in case the herring are in the closed area. When this measure was introduced industry naively welcomed it. We felt this measure would emphatically vindicate us. The scary reality is nobody looks at the observer data except to manipulate it and say we catch everything in the path of the net.

The decision to fish in the closed area is based on the skipper seeing enough fish there to warrant setting on the fish. The skipper usually traverses the GFCA on the way to the Cultivator shoals which is traditionally a good area to fish Herring. If there is an Observer aboard he can now set the net in the GFCA if he sees enough fish there. Herring are very migratory and tend to move a lot over the course of a year.

The fiscal pressure on these boats each trip to catch a full boat load each trip is enormous particularly since the mackerel aren't showing up in New England waters this last two years and the fact they are banned from fishing inshore-GOM. The additional expense these boats are under because of fuel prices and the added steaming time to and from the ground will bankrupt or force some of the smaller boats out of the fishery.

Maybe this is the intension of amendment 5. Assuming a boat left to fish on Georges without an observer because none was available and the only fish he saw was in the ground fish closed area he would have to go ashore without any fish and his next trip would have to cover the $40K or $50K fuel bill the pair of boats burned on the previous trip. Any idea of terminating a boats trip as a punitive measure would be draconian and a malicious intent to bankrupt the boats in the fishery.

Slippage is a term I find very offensive. I heard in use in the 1990's in Gloucester. I was talking to a rod and reel tuna fisherman who told me he hooked up early in the morning and caught a 400 lb. fish. The term slip was used toying with the intent of the law. He told me he was trying for a bigger fish and he could "slip" the smaller fish over the side. Why would a mid-water boat go to the trouble of catching fish and let them go? Or as the document suggests slippage.

There needs to be a very good reason why a skipper would dump a bag of fish. The idea that the skipper knows there is by catch in the net without pumping it aboard to deceive an observer is asinine. If you get into the scourge of the ocean (Dogfish) you will not be able to pump the dog fish. It is actually very difficult to dump them sometime because their coarse skin hangs up in one another and in the brailler, sometimes tearing the brailler. The other reason the skipper might need to dump the bag is because of mechanical difficulty or the seas picking up where he may endanger the lives of the crew or the stability of the boat. Mid water fishing is a commercial enterprise not a catch and release as the discussion on

the slippage implies. Option 2 a release catch affidavit should be the only option considered under slippage.

River Herring by catch is being studied by SMAST at the moment. The program is watching the River herring incidence by rigorous dock side monitoring. When they discover higher levels of river herring they report to the boats the area such incidents occurred so they can avoid the area for the next week or so. By closing down further areas there is no proof that it will avoid catching river herring unless you bankrupt the fleet. River herring populations dropped dramatically in the 1970's and 1980's long before the mid water boats showed up.

The mid-water boat and pair trawlers weren't operating in any numbers until the late 90's and after 2000. The river herring didn't change population appreciably up or down in this period so there is no need for council to make any rulings on the river herring at this point in time. The SMAST study (option 4) should be allowed to continue and after it is finished see has it held reduce the by catch appreciable. With proper data and not hearsay an anecdotal evidence the council can implement stricter measures which may put the boats out of business.

Having attended numerous meetings on the development of this document what I find scary is the ignorance of the public that are commenting on the document. They didn't take the time to read any of the data with the exception of the CHOIR and Herring Alliance propaganda and my greatest worry is the council will rule in the same manner. Comments like overfish were used when it isn't occurring and hasn't occurred in the last 30 years catching everything in the way of the net yet the observer data proves otherwise. Pew through their minions have educated the public with lies anecdotal information and racial hatred as was heard at Fairhaven public comment session.

The mid-water boats are said to be too efficient. If they weren't efficient they wouldn't be in business. The demand to carry 100% observer coverage is driven by Pew to bankrupt the fishery. Only the biggest boats will survive and the cost is going to be push on the consumer the Maine lobsterman primarily. Since 2006 when amendment 1 went into effect the cost of bait has trebled in price yet the document mention only a slight increase may occur.

The other end users are the Nigerians and Egyptians in Africa. These people are the poor people in these country and herring and mackerel are the only protein they can afford. The increased cost cannot be pushed on to them because they don't have the money. The result will be closing the last two plants Norpel and Cape Seafoods. Last year because of the high cost of operating fishing vessels in this fishery and the unyielding nature of council to alleviate a miniscule Haddock catch cap the owners of Norpel sent one vessel to the west coast and the other vessel is up for sale and hasn't fished in over a year.

Cape Seafoods is in a similar dilemma with the Voyager up for sale and hasn't fished for over two years. The Western Venture is also for sale. When I viewed the shorten version of the document pages 77 to 83 that Lori Steel wrote, she is more than aware of the impact these measures will have on industry from the VEC5 column on section 3.4.1. Unfortunately subconsciously she put status quo as a positive for industry. This leads me to believe the intent of Amendment 5 is to cripple the industry; status quo

would normally be view as neutral. The question is do council care? Predicated on how they dealt with the Haddock issue I think not.

When I look at the goals and objectives page 13 item 5 optimum yield which will provide the greatest overall benefit to the nation. Amendment 5 is contrary to all of this. Item 7 minimize race to fish. The states got together to make landing days from area 1A. This forces a race to fish which has not been addressed in the document.

Eoin Rochford

Joan O'Leary

From: John Hanley <john.hanley@innovativestone.com>
Sent: Wednesday, April 11, 2012 1:44 PM
To: comments
Subject: Herring limits

Dear Mr. Howard,

I was elated to read about the limitations that were recently enacted on herring limits for the Atlantic Herring Mid Water Trawl Fleet. However, active enforcement is needed to stop the basic instincts of the commercial fishing industry – to catch until there is nothing left to catch.

I am a relatively recent convert to catch and release fly fishing for striped basss in coastal Maine estuaries. The fish populating has been steadily and rapidly declining for the past five years at least, according to my own experience as well as that of the local salts who frequent the areas that I do. My own investment in equipment and lodging is easily in the tens of thousand of dollars, and I plan to keep fishing for stripers as long as they keep showing up. Despite having caught many hundred, if not thousands of these fish over the years, I have released every fish back into the waters. As do most of my colleagues, I fish for the thrill, not for subsistence. If I need fish, I go to the supermarket for farm raised fish. The natural stocks need to recover from chronic overfishing, and it all starts with the herring.

Please register my support for the initiatives outlined below by Patrick Paquette of the Massachusetts Striped Bass Association to help the herring recover, and thereby helping the stocks of stripers, tuna and herring recover to more sustainable levels.

1. 100 percent at-sea monitoring (Section 3.2.1.2 Alternative 2) on all category A & B midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life.

2. Discourage the wasteful dumping of catch, Section 3.2.3.4 Alternative 4D including the fleet-wide limit of five slippage events per management area. Operational discards are dumping of valuable natural resources and must be included.

3. No herring mid water trawling in areas established to promote rebuilding of ground fish populations (Section 3.4.4 Alternative 5).

4. We cannot wait for new science to protect river herring. We support an immediate catch cap based on recent catch. To limit what is currently being killed as by catch is a good start. We support Section 3.3.5 only if modified to require immediate implementation of a catch cap. Managers will soon vote on a new set of rules to regulate industrial trawlers, vessels which scoop up tons of baitfish off our coast each year.

Thank you for hearing my concerns.

John E. Hanley
CHIEF FINANCIAL OFFICER

Innovative Stone™

Infinite Possibilities, Worldwide Capabilities

INNOVATIVE GLOBAL BRANDS, LLC
130 Motor Parkway, Hauppauge, NY 11788

THE PEW ENVIRONMENT GROUP

RECEIVED
APR 16 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

April 16, 2012

Paul J. Howard
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Mr. Howard,

The Pew Environment Group has collected 36,544 comments from individuals asking the New England Fishery Management Council to take specific steps to manage the Atlantic herring fishery through Amendment 5 to the Atlantic Herring Fishery Management Plan.

The enclosed CD includes copies of many of the letters, and a spreadsheet listing all the signers. Please note that many of these letters have been personalized or include additional comments.

Below you will find a summary the responses from Atlantic states (18,395), and on subsequent pages there is a table of all comments received by state. Please include a summary of these comments for the April NEFMC meeting.

Connecticut: 921
District of Colombia: 79
Delaware: 149
Florida: 1,859
Georgia: 389
Massachusetts: 2,266
Maryland: 911
Maine: 452
North Carolina: 1,237
New Hampshire: 411
New Jersey: 1,605
New York: 4,461
Pennsylvania: 2,112
Rhode Island: 262
South Carolina: 187
Virginia: 1,094

Thank you,

Greg Wells
Associate, Northeast Fisheries Program

Pew Environment Group | The Pew Charitable Trusts
59 Temple Place, Suite 1114 | Boston, MA 02111| p: 617.728.0300
www.PewEnvironment.org

State	Comments collected
Alaska:	75
Alabama:	140
Arkansas:	97
Arizona:	702
California:	5051
Colorado:	683
Connecticut:	921
District of Colombia:	79
Delaware:	149
Florida:	1859
Georgia:	389
Hawaii:	172
Iowa:	172
Idaho:	103
Illinois:	1029
Indiana:	394
Kansas:	154
Kentucky:	196
Louisiana:	135
Massachusetts:	2266
Maryland:	911
Maine:	452
Michigan:	691
Minnesota:	447
Missouri:	340
Mississippi:	78
Montana:	108
North Carolina:	1237
North Dakota:	22
Nebraska:	79
New Hampshire:	411
New Jersey:	1605
New Mexico:	352
Nevada:	251
New York:	4461
Ohio:	700
Oklahoma:	132
Oregon:	691

Pennsylvania:	2112
Rhode Island:	262
South Carolina:	187
South Dakota:	35
Tennessee:	332
Texas:	1213
Utah:	154
Virginia:	1094
Vermont:	111
Washington:	1050
Wisconsin:	526
West Virginia:	87
Wyoming:	32
TOTAL	**36544**
TOTAL US ONLY	**34990**
Atlantic States	**18395**

Example of 36,544 Batch
Emails Rec'd to date

Mr. P Henry
300 Park Terrace Dr
Stoneham, MA 02180-4438

Mar 16, 2012

Paul Howard
New England Fishery Management Council

Subject: Re: Atlantic Herring Fishery Management Plan

Dear Paul Howard,

Over four years ago, the public called for and the New England Fishery Management Council (NEFMC) committed to improving the management of industrial fishing in New England. Now, after several years of deliberation and tens of thousands of public comments, it's time to deliver on that promise of reform.

Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns. Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet.

Since the initiation of Amendment 5, these problems have continued to get worse. The National Marine Fisheries Service (NMFS) has repeatedly proven unable to enforce Atlantic herring quotas, the first step in fishery management, due to inadequate catch monitoring. In addition, the practice of slipping catch at sea continues to undermine efforts to identify and record everything that is caught by herring vessels. Alarming interactions with groundfish also continue, as midwater trawl fishermen recently demanded and received a five-fold increase in their haddock bycatch allowance.

Moreover, river herring populations remain depleted, forcing Atlantic seaboard states to close traditional fisheries and deprive recreational anglers and the public of this important resource. NMFS is now considering listing river herring under the Endangered Species Act.

I urge you, as trustees of our nation's marine resources, to fulfill your duty to conserve and manage these resources sustainably by approving this long-awaited revision without further delay. In particular, I strongly support:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of the catch cap).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage of catch, including a fleet-wide allowance of five slippage events for

each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for the opportunity to comment and for your sustained commitment and support of these priority reforms.

Sincerely,
Mr. P Henry

Cape Cod
Conservation
District

270 Communication Way, Unit 1-H, Hyannis, MA 02601 • PO Box 678, Barnstable, MA 02630
tel: (508) 771-8757 • fax: (508) 771 6509 • e mail: cccd@capecodccd.org

Mr. Paul Howard
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

RECEIVED
APR 17 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

March 8, 2012

Dear Mr. Howard,

The Cape Cod Conservation District is writing to comment on the draft of Amendment 5 to the Atlantic Herring Fishery Management Plan.

The District has been engaged in activities for the past 42 years to improve passage for river herring to their spawning grounds. River herring play an important cultural and ecological role on Cape Cod and their arrival every spring marks the end of a long winter. The District is currently working on the Cape Cod Water Resources Restoration Project – a partnership with the USDA Natural Resources Conservation Service to restore tidal flow to restricted salt marshes, improve water quality on shellfish beds, and improve passage for river herring. In 2012 we will build five new fish ladders and restore tidal flow to four salt marsh systems.

We applaud your efforts to address the bycatch of river herring in the Atlantic Herring fishery. We believe that Amendment 5 to the Atlantic Herring Fishery Management Plan should include provisions that require observers to be present on all vessels that target Atlantic Herring, that the entire catch of these vessels should be provided to the observers for inspection, and that an overall limit or "catch cap" of river herring should be established for each fishing year.

The District will continue to work on projects that protect and increase the populations of river herring in the fresh and brackish waters of Cape Cod. We look forward to knowing that efforts are being made to conserve river herring in their saltwater environment as well. We hope that by working together the moratorium on harvest from Massachusetts rivers can be lifted.

Sincerely,

Lee Davis
Chair, Board of Supervisors, Cape Cod Conservation District

Alan J Evelyn
326 East Dover Street
Valley Stream, NY 11580-4749
capt.al@fishtaxiny.com

RECEIVED
APR 16 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Doug Grout, Chair
NEFMC Herring Oversight Committee
50 Water Street, Mill #2
Newburyport, MA 01950

April 13th, 2012

Re: Herring Amendment 5 DEIS

Dear Chair Grout,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

The mismanagement the herring fishery must stop. The large mid water trawlers are depleting this resource at an unacceptable rate. The Council must address the serious destructive practices of this gear type/practice when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By implementing the above practices/policies, the Council will begin to address the most critical problems in this fishery. Please protect this valuable fishery from the destructive mid water trawls and approve these measures.

Thank you for listening to my opinion.

Alan J Evelyn

BOARD OF TRUSTEES

Niaz Dorry
NAMA Coordinating Director
Gloucester, MA

Ted Hoskins
Board President
Stonington Fisheries Alliance
Blue Hill, ME

Madeleine Hall-Arber, Ph.D.
Board Vice President
MIT Center for Marine Social Sciences
Boston, MA

Amanda Beal
Board Clerk
Maine Eat Local Food Coalition
Freeport, ME

Jamey Lionette
Board Treasurer
City Growers & City Fresh Foods
Jamaica Plain, MA

Bill Adler
Massachusetts Lobstermen's Association
Scituate, MA

Charles Curtin
Environmental Science Faculty
Antioch College, NH

Shannon Eldredge
Fishing Family
Chatham, MA

Louis Frattarelli
Commercial Fisherman
Bristol, RI

Karen Masterson
Owner, Nourish Restaurant
Lexington, MA

Neil Savage
Educator
Exeter, NH

Ed Snell
Commercial Fisherman
Portland, ME

STAFF

Niaz Dorry
Coordinating Director

Boyce Thorne Miller
Science Coordinator

Brett Tolley
Community Organizer

Cynthia Bush
Finance Coordinator & Program Assistant

April 18, 2012

RECEIVED
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Paul J. Howard, Executive Director,
New England Fishery Management Council
50 Water Street, Mill #2,
Newburyport, MA 01950

The Northwest Atlantic Marine Alliance (NAMA) is a regional organization supporting the community-based commercial fishermen of New England and the coastal communities in which they live, consistent with our mission to restore and enhance an enduring marine ecosystem. NAMA's history of weighing in on the herring fishery dates back to the discussions that led to the creation of the first herring fishery management plan in 2000. As you know, we were also party to a 2005 joint legal petition (with the Midcoast Fishermen's Association of Maine) asking the Department of Commerce to ban the herring midwater trawl fleet from groundfish closed areas.

Herring are critical to a healthy marine food chain and ecosystem. As such it is unclear that fishing them at all is justifiable, but certainly the fishery should be seriously restricted. Traditional fixed gear herring fisheries – which consisted of appropriately scaled purse seines and stop seine/weirs - did not appear to have a dramatic impact on the ecosystem, but more modern industrial scale trawl and purse seine fisheries do. Not only is the loss of herring available to the food chain important, but we now know that the herring fishery continues to catch significant groundfish bycatch – especially haddock. This is very important to the groundfishery which is experiencing lean years. In a recent report, an international group of marine scientists has called for cuts in commercial fishing for sardines, herring and other so-called forage fish whose use as food for fish farms is soaring (*Too Many Small Fish Are Caught, Report Says*, NY Times, 4-2-12). The report suggests that catch should be cut in half for some fisheries to protect populations of both the fish and the natural predators that depend on them.

Given the evidence of damaging impacts of industrial fishing of forage fish worldwide, herring Amendment 5 comes none too soon to help alleviate some of that impact in New England. Therefore, NAMA supports the strongest measures be adopted in Amendment 5 and we welcome their application to purse seine vessels as well as trawl vessels. NAMA would like to express its support for the following measures to be included in Amendment 5:

1) Relevant to Section 3.2.1, the Council should implement 100% observer coverage on A&B herring vessels, which account for 97-98% of the landings. We therefore support alternative #2.

2) Relative to Section 3.1.2, we support the expansion of possession limits to include purse seine operations; the elimination of the VMS

power-down provision; and in requirement for dealer permits at-sea.

3) Relative to Section 3.2.2.2, we generally support measures that improve sampling and the increased information that may be generated, and we are supportive of application of these measures to purse seine as well as trawl vessels.

4) Relative to section 3.2.3.4, the Council should implement Closed Area 1 provisions with termination of trips after five dumping events have been reported. This provision should reduce the dumping of catch and bycatch by category A and B vessels. We support alternative 4D.

5) Relative to Section 3.4.4, as we have continued to say for over a decade, the Council should prohibit vessels participating in herring fishing from fishing in groundfish closed areas. The proposal addresses only midwater trawlers, however, and we believe industrial scale purse seiners should be explicitly included. Midwater trawl vessels were given access to the closed areas based on the assumption that their nets remain high in the water so they do not catch any groundfish. Now this has been demonstrated to be untrue, and in fact, they agree they do catch groundfish, sometimes in significant numbers. Therefore they should be subject to groundfish closures. And without an explicit direction for the depth of purse seine vessels' gears, purse seines with nets designed to fish in deeper fathoms can have interaction with groundfish. We support alternative 5.

6) Relative to section 3.3 – measures to address river herring bycatch – we prefer the closed area approach in Alternative 3, as it is more protective of river herring and is more likely to be effectively enforced.

Thank you for the opportunity to comment on Amendment 5. While we don't believe the amendment addresses the core problem of impacts on the marine ecosystem by industrial scale fishing, we believe the right decisions for Amendment 5 will go a long way toward making sure the impacts are no greater than regulations allow.

Yours truly,



Boyce Thorne Miller
Science Coordinator

MAINE
Lobstermen's Association, Inc.
11 Western Avenue, Suite 1 • Kennebunk, ME 04043
Phone: 207-967-4555 • Fax: 866-407-3770
www.mainelobstermen.org

RECEIVED
APR 18 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Mr. Paul Howard
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

April 19, 2012

Dear Mr. Howard:

The Maine Lobstermen's Association (MLA) is providing comments on the proposals under consideration for Amendment 5 to the Fishery Management Plan for Atlantic Herring. The MLA is an industry-based fishing organization whose mission is to advocate for a sustainable lobster resource and the fishermen and communities that depend on it.

One of MLA's primary areas of focus in recent years has been on ensuring a steady and sustainable bait supply for Maine lobstermen. In 2011, Maine lobstermen hauled in a record harvest of nearly 104 million pounds with an ex-vessel value of approximately $331 million, generating an estimated near billion dollars in economic activity for the state. Maine's lobster industry is the economic backbone of Maine's coastal communities because it is an owner-operated fishery which ensures that revenue generated from landings is spent locally.

The fate of the herring management plan is extremely important to the Maine lobster industry because it is highly dependent upon herring as bait for our fishery. Data from Maine Department of Marine Resources Port Sampling program shows that herring was used in 59% of trap hauls by Maine lobstermen in 2011. The Maine lobster industry has diversified its bait supply following the cuts to the Area 1A herring quota beginning in 2007 when herring was used in 83% of traps hauled. Despite the reduction since then, herring is still the primary source of bait use by Maine lobstermen.

The MLA strongly supports sustainable management of the herring resource, based on the best scientific information, and supports the Council's efforts to improve catch monitoring in the commercial fishery through Amendment 5. The MLA offers the following input to the Council:

- The MLA supports implementing measures to weigh the catch across the fishery to improve the accounting of all fish landed.

- The MLA supports 100% observer coverage for Category A and B vessels which account for 97%-98% of the landings, with no sunset provision. The cost of observer coverage should be carefully monitored and controlled. The observer rates for the Atlantic fleet must be on par with other regions of the US. Given the importance of sustainably managing the herring fishery, government funds should be secured to help pay for this comprehensive observer coverage.

  As the primary consumer of herring, any cost incurred by the herring fleet will inevitably be passed onto the lobster industry. The MLA's weekly monitoring of bait prices shows that the lobster industry has already absorbed a 28% increase in the cost of bait during the peak fishing months of July through November over the three years from 2007 ($21/bushel) to 2010 ($27/bushel). With the tightening of profit margins in the lobster industry due to soft boat price and increased operating expenses, the lobster industry cannot afford to absorb the cost of implementing comprehensive observer coverage in the herring industry. Controlling the cost of observer coverage and securing government funding will be critical to ensure successful implementation of 100% observer coverage.

- The MLA supports the sampling of all catch with trip termination after ten dumping events per area. These measures are similar to what has been successfully implemented in Closed Area 1.

- The MLA is concerned about midwater trawl vessel access to groundfish closed areas. These vessels should only be allowed access with 100% observer coverage with a full accounting of all fish caught in order to strictly adhere to bycatch limits.

Thank you for your consideration of our comments.

Sincerely,

Patrice McCarron

Patrice McCarron
Executive Director

CAPE SEAFOODS, INC.
3 STATE PIER
GLOUCESTER, MA 01930, USA
Tel: 978-283-8522: Fax: 978-283-3133
email: dave@capeseafoods.com

and

WESTERN SEA FISHING COMPANY
3 STATE PEIR, GLOUCESTER, MA 01930
Tel: 978-283-7996

RECEIVED
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

April 10th, 2012

Capt. Paul J. Howard
Executive Director
50 Water Street, Mill #2
Newburyport, MA 01950
By Email to: comments@nefmc.org

Re: **Comments on Draft Amendment 5**

Dear Captain Howard:

Cape Seafoods Inc is a processing facility, based in Gloucester Massachusetts, capable of handling, grading, packing, freezing and storing Atlantic Herring. The Company is a major supplier of fresh, salted and frozen herring to the Massachusetts and Maine lobster fisheries. Western Sea Fishing Company owns and operates three purpose built mid-water trawlers which land their herring catches to Cape Seafoods. These vessels are equipped with refrigerated sea water tanks ensuring landings of top quality fresh herring. At the height of the fishing season approximately 60 people are working for one or other of the companies.

Please accept these comments on Draft Amendment 5 (A5) to the Fishery Management Plan (FMP) for Atlantic Herring.

We understand that the National Marine Fisheries Service (NMFS) will be publishing a Draft Environmental Impact Statement (DEIS) on A5, on April 20, 2012, and that we will have an additional opportunity to comment on that document, which may be different than the Public Hearing Document (PHD); the source of these comments. We reserve the right to provide additional or amended comments to the Council and NMFS once we have the opportunity to review the DEIS.

Our comments follow the order of issues and options outlined in the PHD:

Sec. 3.1 PROPOSED ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM

Sec. 3.1.1 Regulatory Definitions (Transfer at Sea and Offload)

We support the establishment of regulatory definitions for *transfer at sea* and *offload* as an intent to clarify the regulatory definition of existing fishing operations, including clarifying that pair trawling does not represent a transfer at sea, increase the potential for accurate reporting in the fishery and minimize the potential for catch to be double-counted.
We request that a definition of "*Localized Depletion*" be included in this Amendment as it does not appear in the plan at the moment.

Sec. 3.1.2 Administrative/General Provisions

We support the proposed regulatory change that would clarify that vessels working cooperatively in the herring fishery are subject to the most restrictive possession limit associated with any of the vessels.
The amendment refers to "paired purse seine operations", which is a description that we are not familiar with in the Atlantic herring fishery; traditionally, any purse seine skiff being used to set a purse seine has been considered part of the purse seiner itself and not a "paired vessel."

We support the amendment's intent to make VMS power-down provisions consistent with the multispecies, scallop and surf clam/ocean quahog fleet and allow VMS units to be powered down after the issuance of a Letter of Exemption (LOE), if the vessel is expected to be out of the water or not fishing for an extended period of time.

We support the establishment of a new Federal At-Sea Herring Dealer permit for carrier vessels or other vessels selling Atlantic herring to any entity since the intent is to improve reporting in the fishery. We encourage the agency to ensure that double-counting of landings is minimized through this change.

Sec. 3.1.3 Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea

We support 3.1.3.2 Option 3, which would provide flexibility for herring carriers to either utilize a VMS for declaration, thereby eliminating the minimum seven-day enrollment period and allow for engagement in other activities, or maintain the status quo (minimum seven day enrollment period with LOA restrictions), which would accommodate smaller carrier vessels that do not utilize VMS.

We support 3.1.3.3 Option 1, which would make no changes to current provisions regarding the transfer of fish at sea. It is our understanding that current reporting requirements are adequate to determine and segregate catches and allow for the transfer of herring at sea to vessels without a herring permit, for personal use as bait.

Sec. 3.1.4 Trip Notification Requirements

We support a combination of 3.1.4.2 Option 2 and 3.1.4.3 Option 3, which would expand and standardize current trip notification requirements throughout the herring fishery, as we understand the proposal. We understand that Option 2 would not reach Category D vessels fishing in Area 2 (because the current language stems from that implementing the haddock catch cap) and, therefore, why Option 2 is limited only to fishing for herring with midwater trawl gear.

For the purposes of this amendment, however, all areas and gear types should be considered as part of these notification requirements.

Option 3, however, seems to include all fishing activity in Area 2, and in other herring management areas, and require both observer and enforcement notifications regardless of gear type used. It is our understanding that the small mesh bottom trawl fleet can also take river herring as an incidental catch, not only in the Gulf of Maine but also in Area 2 during the winter months, so it only makes sense that all vessels working in the directed herring fishery, whether it be with an A, B, C or D permit, be required to both call for observers before fishing and notify NMFS law enforcement before landing, so that monitoring activities, both at sea and shoreside, can provide the most complete picture of what is being caught and landed in the fishery.

Based upon herring fishery landings and other data that has been reviewed during the development of Amendment 5, our understanding is that the number of Category D vessels that would be regulated under this change, and others proposed in this amendment, would be less than 10% of the number Category D permits issued.

Specifically, Page 6 of the PHD tells us that 2,258 Category D herring permits were issued in 2010 while Table 49, at page 200 of the Council's DEIS tells us that less than 100 of these permit holders landed herring in recent years.

There seems to be a clear need to rationalize the number of Category D herring permits that are being issued by the agency. We strongly support a requirement that all Category D permit holders have VMS on board, when engaged in the directed fishery for herring, and we anticipate that the number of herring Category D permits applied for would likely drop dramatically if this requirement were imposed. We do not see a VMS requirement as a significant economic burden on a vessel today and expect that most of these 100 Category D permitted vessels landing herring may already be required to have VMS on board through other permit requirements.

Sec. 3.1.5 Reporting Requirements for Federally Permitted Herring Dealers

We support 3.1.5.2 Option 2, which would require dealers to accurately weigh all fish, and *Sub-Option 2B*, requiring dealers who do not sort by species to document, for individual landing submissions, how they estimated the relative composition of a mixed catch, to facilitate both quota monitoring, incidental catch analysis and cross-checking with other data sources.

We are opposed to 3.1.5.2, *Sub-Option 2C*, which would require dealers to obtain vessel confirmation of SAFIS transaction records to minimize data entry errors at the first point of sale. This proposal seems to be focused on minimizing discrepancies between vessel hails (an estimate of what is on board) and actual amounts of herring that is purchased by dealers. It places fishermen and dealers in a potentially adversarial, competitive regulatory posture that should be reserved for the Agency, as we understand what is being proposed.

If catch is weighed and sorted after landing, dealer reports should become the primary data source for quota monitoring by the Agency, as we understand to already be the case today. Weighing and sorting will make dealer reports more accurate than they are today and eliminate the need for fishermen and dealers to compare their reports, and put fishermen in a position so that they could be penalized if estimates and actual weights vary, which they will certainly continue to do.

Sec. 3.1.6 Changes to Open Access Permit Provisions for Limited Access Mackerel Vessels in Area 2/3

We support 3.1.6.2 Option 2, which would establish a new open access herring permit for limited access mackerel fishery participants, in Areas 2/3 only, who do not have a limited access herring permit. This permit would be associated with a 20,000 pound possession limit for herring and would assist these vessels by providing a reasonable incidental catch allowance of herring to allow them to be able to fish for mackerel and may reduce discards of herring. This amount equates roughly to the 25,000 pound mackerel incidental catch allowance, provided by the MAFMC for vessels fishing for herring, in all herring management areas, which was established in Amendment 11, the mackerel limited access amendment.

We also urge the Council to begin now to plan for allocating a significant set-aside of Atlantic herring, and explore other options during the upcoming specifications process, such as taking days out of the herring fishery, to facilitate an Atlantic mackerel fishery in the future that is not severely limited by lack of availability of Atlantic herring, as is the case this year.
This year, the expiration of the Area 2 herring quota will keep potentially more than 50 million pounds of mackerel from being harvested, at the same time that herring continue to be widely available in Area 2, according to accounts we have received from vessel captains. Many vessels are tied up today due to this fact and millions of dollars of wasted mackerel quota will not be taken due to the failure of the Agency and the NEFMC to set-aside herring quota for this purpose, as we requested when the current specifications were established.

We estimate that a 10,000 metric ton set-aside may be adequate for this purpose, given the size of the current mackerel quota, and since the herring-to-mackerel mixing ratio can often be as much as 30%. It is our hope that the ongoing assessment will provide an opportunity to return the Area 2 quota to a level exceeding 30,000 metric tons, as has been the case in the past, to facilitate a mackerel fishery in the future.

Sec. 3.2 CATCH MONITORING: AT-SEA

3.2.1 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels

Throughout the development of Amendment 5, we have argued that the herring fishery should not be singled out as being required to pay for excessive levels of observer coverage, beyond what the Agency and Council may prioritize through the SBRM process; a treatment similar to other fisheries managed by the Council.

We have taken this position because we believe that the herring fishery is one of the 'cleanest' fisheries in the region, and that this fact continues to be borne out by the data coming out of both the at-sea observer program and the shoreside monitoring program, a program that we believe should be continued in the region.

We have heard herring PDT members say that there is a limit as to the precision and accuracy of catch data accumulated through the observer program, even if the coverage level were to be at 100%.

Even so, we and the majority of other Category A-permitted herring vessels owners are willing to support observer coverage levels of 100 per cent in the herring fishery, for a limited period of time, because we remain convinced that the data will continue to show that incidental catches in

this fishery are not of significant biological concern to haddock, shad, river herring or any other regional fishery stocks. We are taking this position as a challenge to our detractors, who so far have shown no interest in the actual data coming from current monitoring programs and who continue to make unsubstantiated claims about how the herring fishery operates. We will take observers at a 100% rate to continue to demonstrate that the herring fishery is a responsible fishery.

We take this position with a couple of caveats, however. First, we do not support maintaining 100% observer coverage levels in the herring fishery forever since we do not believe this coverage rate is necessary and because the expense can be significant. We suggest that a 100% requirement be temporary and only last two years, after which time the PDT should be tasked to analyze the data and report to the Council as to whether or not this level of coverage is necessary to adequately monitor the herring fishery in the future.

Second, we are only willing to purchase observer coverage, beyond those levels that may be allocated through the SBRM process and up to 100%, if the daily cost can equate to the $325 a day rate paid by the West Coast H&G fleet, a fleet whose observer coverage rates have been suggested as a model for the herring fishery during the development of Amendment 5 by those who argue that we are under regulated and operating unsustainably. We are opposed to paying any higher daily rate since this represents a cost that would not be sustainable in the low value Atlantic herring fishery.

Third, we only support a temporary, 100% observer program in the herring fishery if the program would authorize the Agency to provide a vessel with a waiver if a Federal observer, or an observer from an approved observer service provider, is not available for a particular trip. We simply cannot afford to have our vessels tied up if an observer is not available to us for some reason and we are willing to both take and pay for an observer on that trip.

Sec. 3.2.2 Management Measures to Improve/Maximize Sampling At-Sea

We support the addition of the provisions listed in Sec. 3.2.2.2, which are intended to improve sampling by observers at-sea and we understand that many of these provisions are already in place; these include requirements for a safe sampling station, requirements for 'Reasonable Assistance', requirements to provide notice, requirements for trips with multiple vessels, improving communication on pair trawl vessels and providing visual access to the net and codend. It is our understanding that the relationship between the Federal observers that have been on our vessels over the past few years and our fishing captains is excellent and we have attempted to cooperate with every request made to us by the observer program throughout this period of time.

Sec. 3.2.3 Measures to Address Net Slippage

We support Sec. 3.2.3.2 Option 2 requiring the use of a released catch affidavit for 'slippage events' and understand that these affidavits are already in use, with the support of vessel owners and captains.

We are opposed, however, to the continued application of the Closed Area 1 Sampling Provisions (Sec. 3.2.3.3), either within Closed Area 1 or elsewhere, because of the requirement that all fish be brought on board for sampling and inspection by the observer. As we have repeatedly pointed out during the development of Amendment 5 there are significant operational

restrictions that make it impossible, or dangerous, to bring the pump and codend or brailer over the rail during fishing activities on midwater trawl fishing vessels. Our captains tell us that the observers have no problem seeing what remains in the net after pumping, while the net remains alongside the vessel and, as we indicate above, our captains have no problem providing visual access to the net and codend so that the observer can do his or her job.

We are strongly opposed, however, to all of the options listed in Sec. 3.2.3.4, Options 4A through 4D (proposing catch reduction and trip termination), as being simply punitive in nature and not being constructive to the ongoing cooperation between our captains and the observers on our vessels. In addition, we urge the Council and the Agency to repeal the Closed Area I regulations since there is no indication that incidental catches in Closed Area I differ significantly from those in other areas where the herring fishery operates and due to the fact that there is no data to indicate that the herring fishery is having any significant mortality effect on any groundfish species, either inside or outside of Closed Area I.

It is important, however, to retain in regulation that fish can be released throughout the herring fishery if the vessel operator finds that:

1. Pumping the catch could compromise the safety of the vessel;
2. Mechanical failure precludes bringing some or all of the catch aboard the vessel; or
3. Spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.

Finally, as we all know, the Council's habitat and groundfish committees are moving towards either eliminating Closed Area I or modifying the area due to its lack of relevance today as either a groundfish protection or habitat protection area, making regulations specific to the area equally irrelevant to managing the herring fishery today or in the future.

Sec. 3.2.4 Maximized Retention Alternative (Experimental Fishery)

We support Sec. 3.2.4.1, the no action alternative. Herring vessels would continue to operate under the regulations and possession limits for any fisheries for which they possess permits. Amendment 5 would add other regulatory changes, which we could support consistent with our comments, and would aid observers in their responsibility to see and sample catches.

The herring fishery has taken place in this region for more than 100 years and was the first fishery to agree to hard quotas, more than a decade ago, with the approval of the Federal FMP by the Council and Agency, in 2001. The idea that the herring fishery should be operated as an experimental fishery has been suggested by advocates who clearly would like to eliminate the majority of the fishery and the vessels in it. This proposal only has punitive value and should be summarily rejected by the Council.

Sec. 3.3 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

Sec. 3.3.2 River Herring Monitoring/Avoidance

The public hearing document tells us that the long-term goal of this section of the proposed amendment is to adopt river herring bycatch avoidance strategies in the time and areas where interactions with the herring fishery are observed or anticipated.

At the same time, the Magnuson-Stevens Fishery Conservation and Management Act's National Standard Nine requires that "*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.*" National Standard One requires that "*conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the United States fishing industry.*" The Atlantic herring fishery is not considered overfished, nor is overfishing occurring, so maintaining OY in the fishery must be a Council priority.

We agree with the amendment's goal, since it has now become clear to us that minimizing the incidental catch of alosine species has recently become both a public and a Council interest and we recognize our duty under the law to reduce the incidental catch of these fish.

As this amendment has developed over the last few years, however, we have come to the realization that most of the river herring monitoring and avoidance strategies proposed by the Council in the amendment do not recognize the temporal and spatial variations dictating where river herring will be from year to year, or even from day to day, and that the extensive areas that are proposed to be closed threaten our ability to continue to catch herring to provide an important baitfish for the region's lobster fisheries and other markets.

Consequently, during the past two years, we have been working with other boat owners, organized as the Sustainable Fisheries Coalition (SFC), and in partnership with the Massachusetts Division of Marine Fisheries (DMF) and the UMASS Dartmouth School of Marine Science and Technology (SMAST), to replicate a bycatch avoidance project already in use in the scallop fishery, to reduce the incidental catch of yellowtail flounder; an approach recognized as effective by this Council.

Our project, funded for the past two years through the National Fish and Wildlife Foundation, and with recent financial support from the Nature Conservancy to allow for the participation in the project by small mesh bottom trawl fishermen, is already working to create awareness of the issue within the fleet and direct effort away from where river herring species are known to be on a daily, real time basis. At this time, we are seeking additional funding through the MAFMC RSA program, so that this low cost, real time program can continue into the next fishing year. This program includes a goal of monitoring 50% of trips that are landed, so that incidental catches can be identified and quantified.

Within this context, we support Sec. 3.3.2.2.4 Option 4, a two-phase bycatch avoidance approach based on the SFC/SMAST/DMF project, as the only option that will work to reduce the incidental catch of river herring in the herring fishery and allow for the continued production of optimum yield from the Atlantic herring resource. The project should involve all vessels directing on Atlantic herring, including Category A, B, C and D permit holders. VMS is essential to the success of this project and therefore, all Category D permitted vessels directing on Atlantic herring should be required to have VMS on board.

Sec. 3.3.5 River Herring Catch Caps

We do not support the Council considering a biologically-based river herring catch cap through a framework adjustment to the herring FMP or the herring specifications process with this amendment. It is our understanding that the PDT has not made a recommendation for a catch cap because there is insufficient information upon which to base one. The relative mortality

effects of incidental catches in the herring fishing, and would be critically important to understand before setting a biologically-based catch cap.

Sec. 3.4 MANAGEMENT MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

As stated above, we believe that there is no relationship between incidental catches in the Atlantic herring fishery and the groundfish closed areas. The GFCAI provisions (CFR §648.80) should be repealed upon implementation of this amendment for this reason and access to the groundfish closed areas should be retained for both herring midwater trawlers and purse seiners, through a LOA issued by the agency, as had been the case for many years.

In response to a previous legal challenge to midwater trawlers' rational access to GFCAI and other mortality closures, in a brief to a Federal court in June 2009, Agency attorneys wrote, "*even if bycatch in the herring fishery (was) hundreds of times the level suggested by the data, then there would be no compelling reason to suspect that haddock or other groundfish stocks (are) imperiled.*" The Agency also clarified in its brief that, "*by contrast, the directed groundfish fishery's total allowable catch of haddock is...500 times the (existing) herring bycatch cap*" and "*for those stocks that are undergoing overfishing, the bycatch in the herring fishery is so miniscule that the measures sought (evicting herring vessels) could not prevent overfishing of these stocks.*"

In conclusion we strongly support Sec. 3.4.1 *Alternative 2 – Pre-Closed Area I provisions*, which would reestablish criteria for midwater trawl vessel access to the groundfish closed areas based on provisions prior to the implementation of the Closed Area I rule.

Thank you for your consideration of our comments. We look forward to continuing to work with you and the members of the Council towards the implementation of reasonable, additional monitoring requirements in the Atlantic herring fishery, through the implementation of Amendment 5, to ensure a sustainable Atlantic herring resource and fishery for many years to come.

With best regards,

Dave Ellenton

General Manager / VP Cape Seafoods Inc
V/P Western Sea Fishing Company



New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. "Rip" Cunningham, Jr., *Chairman* | Paul J. Howard, *Executive Director*

Written Comments received for Draft Amendment 5 to the Herring FMP

These are comments received during the NEPA comment period (April 20, 2012 – June 4, 2012)

Anthony LiCausi
64 Linden Rd
Melrose, Ma 02176
Tonyalc1@comcast.net

May 14th, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman for over 40 years, I have seen firsthand the negative impacts on fish that prey on herring created by the large mid-water trawlers. These boats have been able to fish with rules that are totally inadequate to sustain the fishery given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including by catch of river herring, cod, haddock, Bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that un-sampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring mid-water trawl vessels from fishing in ground fish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your consideration,

Anthony LiCausi

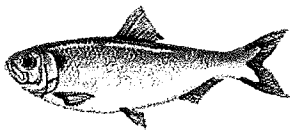
Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:07 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Herrring amendments
Attachments: May 14th Herring Comment.docx

---------- Forwarded message ----------
From: **Cody Hallett** <cody-1012@hotmail.com>
Date: Mon, May 14, 2012 at 7:35 AM
Subject: Comments on Herrring amendments
To: heramendment5@noaa.gov

Attached is a file regarding the herring amendments

Alewife Harvesters of Maine



"Conserving to preserve Maine's heritage

RECEIVED
MAY 15 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Captain Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

April 30, 2012

Re: Amendment 5 to the Atlantic Herring FMP

Dear Capt. Howard,

I am writing to submit comments on Amendment 5 to the Atlantic Herring Fishery Management Plan from the Alewife Harvesters of Maine (AHM). AHM is a 501(c)(6) organization dedicated to preserving river herring (alewife primarily, but also blueback herring) runs and the heritage of alewife fisheries across the state of Maine. Amendment 5 is of great interest to our organization as it represents the first significant attempt to manage interactions between the oceanic fishery for Atlantic herring and the in-river fisheries for river herring. AHM has a philosophy of partnership and willingness to work with any stakeholder interested in sustainable fisheries. We believe that the Atlantic herring fishery is important in the region, both for herring fishermen and lobstermen (who are also the primary customers of our harvesters), and that the two herring fisheries can sustainably co-exist.

River herring fisheries are now held to a high standard of sustainability following passage of Amendment 2 to the ASMFC's Shad and River Herring Interstate Management Plan. The burden of proof for sustainability has shifted to river herring harvesters along the coast, and we must now demonstrate adequate stock status, monitoring and management in order for harvest to persist. Conversely, harvest of river herring by the Atlantic herring fleet is unmanaged, and Amendment 5 presents our first opportunity to rectify that imbalance.

Accordingly, AHM particularly supports the following two alternatives in the amendment:

Section 3.2 – Catch monitoring at sea
Support Alternative 2 in section 3.2.1.2 (100% coverage) with funding Option 2 (federal + industry).

The debate over bycatch impacts on river herring populations has been hampered by limited and noisy data collected to summarize the volume of bycatch. Improving the quantity and quality of data can allow both better understanding of impacts and development of more effective solutions. Ongoing work to map genetic profiles of alewives along the coast will allow bycatch impacts to be linked to particular geographic regions if biological samples are collected as part of the monitoring program. The volume of the Atlantic herring fishery coupled with

PO Box 51, Dresden, Maine, 04342 (207) 737-9052, (207) 441-3006 jeffreypiercerr@roadrunner.com

the dire status of many river herring populations outside of Maine means complete monitoring is essential to finding a balance between the two fisheries.

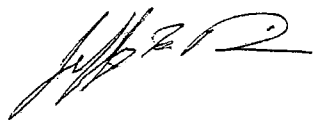
Section 3.3 – Measures to address river herring bycatch
Support Alternative 3 (protection areas) with Option 2 (triggered closures).

Ideally, we would implement a river herring bycatch cap. However, that is probably impractical in the near term until we can determine a number that is not so low as to be meaningless and so high as to be economically devastating for the herring fleet. The increased monitoring supported above will help us arrive at appropriate catch cap levels. In the meantime, closing known bycatch hotspots when a threshold is reached seems to find the right balance between minimizing economic impacts on the herring fleet, and by extension the lobster fishery, and achieving meaningful and lasting reductions.

Also, we note that the fleet communication and avoidance system being developed and tested by the Sustainable Fisheries Coalition, SMAST and Massachusetts DMF has tremendous potential to help the fleet avoid triggered closures, as well as avoiding a bycatch cap, if management moves in that direction eventually. However, that program alone is inadequate because there are no actions required by the fleet in response to hitting threshold bycatch levels. Until regulatory action or a legally binding contract within the fleet creates the needed requirements, this program will best serve as a prototype for controlling bycatch, best employed within the framework of other regulations.

Thank you for considering the views of AHM. We look forward to working with NEFMC in continuing to improve sustainable management for New England fishermen.

Sincerely,



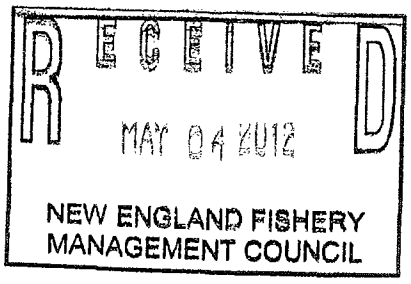
Jeffrey Pierce
Executive Director and Founder

PO Box 51, Dresden, Maine, 04342 (207) 737-9052, (207) 441-3006 jeffreypiercerr@roadrunner.com

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

May 4, 2012



Mr. Daniel Morris, Acting NMFS Regional Administrator
Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930
HerAmendment5@noaa.gov

Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950
phoward@nefmc.org
comments@nefmc.org

Re: Public Comment on Draft Amendment 5 to the Atlantic Herring Fishery Management Plan and its Draft EIS No. 20120104. *See* Notice Of Availability, 77 Fed. Reg. 23713 (Apr. 20, 2012).

Dear Mr. Morris and Mr. Howard,

On behalf of Michael S. Flaherty, Captain Alan Hastbacka, and the Ocean River Institute (together "Mr. Flaherty") please accept these comments on Amendment 5 and its DEIS. It is Mr. Flaherty's view that blueback herring, alewife, American shad, and hickory shad (together "River Herring") must be added to the Atlantic herring FMP because these stocks are without question involved in the fishery and in need of conservation and management. *See Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 9, 2012), 16 U.S.C. § 1852(h)(1), and 50 C.F.R. § 600.310(d)(1). The "river herring catch cap in a future" alternative, *see* Amendment 5 DEIS, § 3.3.5 at p. 76, should be modified to add these species to the FMP as stocks in the fishery, and a trailing action should be initiated immediately to set the actual ACLs, AMs, and other required management measures, similar to Alternative set 9b-9e currently contained in the Mid-Atlantic Fishery Management Council's Amendment 14 to the Squid, Mackerel, Butterfish FMP DEIS, attached as Exhibit 1.

The documents listed below and either included as attachments to this letter, or provided through citation because their file size is too large to easily transmit, support the requested action. Please include all of these documents in the Amendment 5 administrative record and ensure that they are considered as part of your deliberations on Amendment 5:

1625 MASSACHUSETTS AVENUE NW, SUITE 702 WASHINGTON, DC 20036
T: 202.667.4500 F: 202.667.2356 E: dcoffice@earthjustice.org W: www.earthjustice.org

1. The NMFS finding that a listing of river herring under the Endangered Species Act as a "threatened" species may be warranted. *See* 76 Fed. Reg. 67652 (Nov. 2, 2011), attached as Exhibit 2.
2. The ASMFC's American Shad Stock Assessment Report No. 07-01, entitled *American Shad Stock Assessment Report for Peer Review* – Volume I (Stock Assessment Overview (August 2007)), Volume II (State-Specific Assessments for Maine to Delaware River and Bay (August 2007), and Volume III (State-Specific Assessments for Maryland to Florida (August 2007)), all available at: http://www.asmfc.org/ (follow link to Managed Species, follow link to Shad and River Herring, see Stock Assessment Reports).
3. The ASMFC's American Shad Peer Review Report of the American Shad Stock Assessment Report No. 07-01, entitled *Terms of Reference & Advisory Report to the American Shad Stock Assessment Peer Review*, attached as Exhibit 3 and also available at: http://www.asmfc.org/ (follow link to Managed Species, follow link to Shad and River Herring, *see* Stock Assessment Reports).
4. The ASMFC's River Herring Stock Assessment Report No. 12-02, available at: http://www.asmfc.org/meetings/2012SpringMtg/ShadandRiverHerringManagementBoard_2.pdf.
5. The ASMFC's River Herring Peer Review of Stock Assessment Report No. 12-02, entitled *Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review,* attached as Exhibit 4 and also available at: http://www.asmfc.org/ (follow link to Meetings, follow link to ASMFC Spring Meeting, follow link to Shad and River herring Management Board Materials #2, pp. 1-36. The Stock Assessment Report and the Peer Review Report were accepted for management use by the ASMFC on May 1, 2012.
6. The MAFMC's Alternative Set 9 to the MAFMC's Draft EIS for Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, attached as Exhibit 1 and also available at: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm pp. 82-88, 189-195.
7. The MAFMC's Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP), available at: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm (follow link to Full Amendment 14 Draft Environmental Impact Statement is available: Click Here).
8. Judge Kessler's Opinion in the United States District Court for the District of Columbia, *Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 9, 2012), attached as Exhibit 5.

Thank you for considering these comments. Mr. Flaherty, Mr. Hastbacka, and the Ocean River Institute intend to comment further on Amendment 5 as part of CHOIR or the Herring Alliance, and may also supplement these comments individually as well.

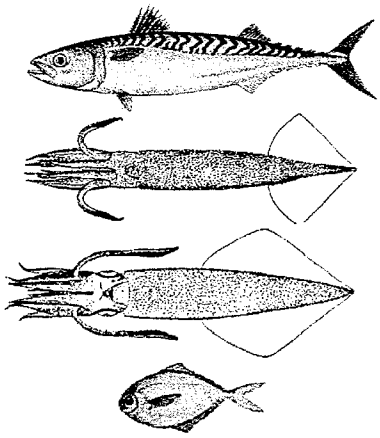
Sincerely,

/s/ Roger Fleming

Roger Fleming, Attorney
Erica Fuller, Attorney
Earthjustice
rfleming@earthjustice.org
efuller@earthjustice.org

AMENDMENT 14 TO THE ATLANTIC MACKEREL, SQUID, AND BUTTERFISH (MSB) FISHERY MANAGEMENT PLAN (FMP)

Draft Environmental Impact Statement
The Executive Summary will serve as the Public Hearing Document



----------April 2012 ----------

Mid Atlantic Fishery Management Council
in cooperation with
the National Marine Fisheries Service (NOAA Fisheries)

A Publication of the Mid-Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award No. NA10NMF4410009

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

1.0 TABLE OF CONTENTS

1.0 TABLE OF CONTENTS 2

1.1 LIST OF TABLES 5
1.2 LIST OF FIGURES 7

2.0 EXECUTIVE SUMMARY 9

2.1 SUMMARY OF THE ALTERNATIVES AND THEIR IMPACTS 12
2.1.1 Alternative Set 1: Additional Vessel Reporting Measures 13
2.1.2 Alternative Set 2 – Additional Dealer Reporting Measures 21
2.1.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures 25
2.1.4 Alternative Set 4 - Port-side and Other Sampling/Monitoring Measures 38
2.1.5 Alternative Set 5 – At-Sea Observer Coverage Requirements 43
2.1.6 Alternative Set 6 - Mortality Caps 53
2.1.7 Alternative Set 7 – Restrictions in areas of high RH/S catch 61
2.1.8 Alternative Set 8 – Hotspot Restrictions 71
2.1.9 Alternative Set 9 – Addition of RH/S as "Stocks in the Fishery" in the MSB FMP 82
2.2 SUMMARY TABLES 90
2.3 INITIAL AREAS OF CONTROVERSY 103
2.4 CONSIDERED BUT REJECTED MANAGEMENT ACTIONS 103
2.5 REGULATORY BASIS FOR THE AMENDMENT 105

3.0 LIST OF ACRONYMS AND ABBREVIATIONS 106

4.0 INTRODUCTION AND BACKGROUND 110

4.1 PROBLEMS/NEEDS FOR ACTION AND CORRESPONDING PURPOSES AND BACKGROUND 110
4.2 HISTORY OF FMP DEVELOPMENT 114
4.3 FMP GENERAL MANAGEMENT OBJECTIVES/GOALS 116
4.4 MANAGEMENT UNIT/SCOPE 116

5.0 MANAGEMENT MEASURES AND ALTERNATIVES 117

5.1 ALTERNATIVE SET 1: ADDITIONAL VESSEL REPORTING MEASURES 119
5.1.1 Statement of Problem/Need for Action 119
5.1.2 General Rationale & Background 119
5.1.3 Management Alternatives 120
5.2 ALTERNATIVE SET 2: ADDITIONAL DEALER REPORTING MEASURES 126
5.2.1 Statement of Problem/Need for Action 126
5.2.2 General Rationale & Background 126
5.2.3 Management Alternatives 126
5.3 ALTERNATIVE SET 3: AT-SEA OBSERVATION OPTIMIZATION MEASURES 130
5.3.1 Statement of Problem/Need for Action 130
5.3.2 General Rationale & Background 130
5.3.3 Management Alternatives 131
5.4 ALTERNATIVE SET 4 - PORT-SIDE, 3RD PARTY, AND OTHER SAMPLING/MONITORING MEASURE 137
5.4.1 Statement of Problem/Need for Action 137
5.4.2 General Rationale & Background 137
5.4.3 Management Alternatives 138
5.5 ALTERNATIVE SET 5 - AT-SEA OBSERVER COVERAGE REQUIREMENTS 144
5.5.1 Statement of Problem/Need for Action 144
5.5.2 General Rationale & Background 144
5.5.3 Management Alternatives 145
5.6 ALTERNATIVE SET 6 - MORTALITY CAPS 161
5.6.1 Statement of Problem/Need for Action 161
5.6.3 General Rationale & Background 161
5.6.4 Management Alternatives 162

5.7 ALTERNATIVE SET 7 – RESTRICTIONS IN AREAS OF HIGH RH/S CATCH 170
5.7.1 Statement of Problem/Need for Action *170*
5.7.2 General Rationale & Background *170*
5.7.3 Management Alternatives *172*
5.8 ALTERNATIVE SET 8 – HOTSPOT RESTRICTIONS 178
5.8.1 Statement of Problem/Need for Action *178*
5.8.2 General Rationale & Background *178*
5.8.3 Management Alternatives *179*
5.9 ALTERNATIVE SET 9 - ADD RH/S STOCKS AS "STOCKS IN THE FISHERY" WITHIN THE MSB FMP ... 189
5.9.1 Statement of Problem/Need for Action *189*
5.9.2 General Rationale & Background *189*
5.9.3 Management Alternatives *194*

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT 196

6.1 PHYSICAL ENVIRONMENT 196
6.2 BIOLOGY OF THE MANAGED RESOURCES 197
6.2.1 Atlantic mackerel (mackerel) *197*
6.2.2 Illex illecebrosus *201*
6.2.3 Butterfish *203*
6.2.4 Longfin Squid *204*
6.2.5 River Herrings (blueback herring and alewife) *210*
6.2.6 Shads (American and hickory) *213*
6.2.7 Atlantic Herring *215*
6.3 NON-TARGET SPECIES (FISH) 216
6.4 HABITAT (INCLUDING ESSENTIAL FISH HABITAT (EFH)) 224
6.5 ENDANGERED AND PROTECTED SPECIES 225
6.5.1 Description of species that are known to interact with MSB fisheries *228*
6.5.2 Atlantic Trawl Gear Take Reduction Plan *233*
6.5.3 Description of Turtle Species with Documented Interactions with the MSB Fisheries *236*
6.5.4 Birds *237*
6.5.5 Atlantic Sturgeon *238*
6.5.6 Description of Candidate Species for Listing Under the ESA *240*
6.6 FISHERY, PORT, AND COMMUNITY DESCRIPTION (HUMAN COMMUNITIES) 241
6.7 FISHERY AND SOCIOECONOMIC DESCRIPTION 242
6.7.1 Atlantic mackerel (mackerel) *242*
6.7.2 Illex illecebrosus *254*
6.7.3 Atlantic butterfish *261*
6.7.4 Longfin Squid *268*

7.0 ANALYSIS OF THE IMPACTS OF THE ALTERNATIVES 277

7.1 ALTERNATIVE SET 1: ADDITIONAL VESSEL REPORTING MEASURES 279
7.2 ALTERNATIVE SET 2 – ADDITIONAL DEALER REPORTING MEASURES 301
7.3 ALTERNATIVE SET 3: ADDITIONAL AT-SEA OBSERVATION OPTIMIZATION MEASURES 314
7.4 ALTERNATIVE SET 4 - PORT-SIDE AND OTHER SAMPLING/MONITORING MEASURES 341
7.5 ALTERNATIVE SET 5 – AT-SEA OBSERVER COVERAGE REQUIREMENTS 352
7.6 ALTERNATIVE SET 6 - MORTALITY CAPS 373
7.7 ALTERNATIVE SET 7 – RESTRICTIONS IN AREAS OF HIGH RH/S CATCH 394
7.8 ALTERNATIVE SET 8 – HOTSPOT RESTRICTIONS 412
7.9 ALTERNATIVE SET 9 – ADDITION OF RH/S AS "STOCKS IN THE FISHERY" IN THE MSB FMP 437

8.0 CUMULATIVE EFFECTS ASSESSMENT 447

8.1 SIGNIFICANT CUMULATIVE EFFECTS FROM PROPOSED ACTION AND ASSESSMENT GOALS 449
8.2 GEOGRAPHIC BOUNDARIES 449
8.3 TEMPORAL BOUNDARIES 450
8.4 IDENTIFY OTHER ACTION AFFECTING THE RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES OF CONCERN. 450

8.5 RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES IDENTIFIED IN SCOPING IN TERMS OF THEIR RESPONSE TO CHANGE AND CAPACITY TO WITHSTAND STRESSES 461
8.6 STRESSES AFFECTING THE RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES AND THEIR RELATION TO REGULATORY THRESHOLDS 461
8.7 BASELINE CONDITION FOR THE RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES 465
8.8 CAUSE-AND-EFFECT RELATIONSHIPS BETWEEN HUMAN ACTIVITIES AND RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES 469
8.9 MAGNITUDE AND SIGNIFICANCE OF CUMULATIVE EFFECTS 469

9.0 CONSISTENCY WITH THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT 472

9.1 NATIONAL STANDARDS 472
9.2 OTHER REQUIRED PROVISIONS OF THE MAGNUSON-STEVENS ACT 473
9.3 ESSENTIAL FISH HABITAT ASSESSMENT 476

10.0 RELATIONSHIP TO OTHER APPLICABLE LAW 477

10.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) 477
10.1.1 Introduction 477
10.1.2 Development of EIS 478
10.1.3 List of Preparers and DEIS Distribution List 478
10.2 MARINE MAMMAL PROTECTION ACT (MMPA) 481
10.3 ENDANGERED SPECIES ACT (ESA) 481
10.4 COASTAL ZONE MANAGEMENT ACT 481
10.5 ADMINISTRATIVE PROCEDURES ACT 482
10.6 INFORMATION QUALITY ACT 482
10.7 PAPERWORK REDUCTION ACT 484
10.8 IMPACTS RELATIVE TO FEDERALISM/E.O. 13132 484
10.9 ENVIRONMENTAL JUSTICE/E.O. 12898 485
10.10 REGULATORY FLEXIBILITY ACT/E.O. 12866 485
10.10.1 Regulatory Impact Review and Initial Regulatory Flexibility Analysis (IRFA) 485
10.10.2 Description of Management Objectives 485
10.10.3 Description of the Fisheries 485
10.10.4 Statement of Problem/Need for Action 486
10.10.5 Description of the Alternatives 486
10.10.6 Economic Analysis 486
10.10.7 Determination of Significance under E.O. 12866 486
10.10.8 Initial Regulatory Flexibility Analysis 487
10.10.9 Reasons for Considering the Action 487
10.10.10 Objectives and Legal Basis for the Action 487
10.10.11 Description and Number of Small Entities to Which the Rule Applies 488
10.10.12 Recordkeeping and Reporting Requirements 489
10.10.13 Duplication, Overlap, or Conflict with Other Federal Rules 489
10.10.14 Economic Impacts on Small Entities 489

11.0 LITERATURE CITED 490

12.0 INDEX 523

13.0 APPENDICES 524

5.9 Alternative Set 9 - Add RH/S Stocks as "Stocks in the Fishery" within the MSB FMP

5.9.1 Statement of Problem/Need for Action

The overall existing federal/state/regional management framework may be insufficient to adequately conserve RH/S stocks (see Section 6.2 for a summary of RH/S stock statuses). Adding RH/S stocks as "stocks in the fishery" in the MSB FMP would not fix every problem but would bring some additional resources to bear on RH/S problems, though that may mean that other management priorities receive less resources.

Note: It is not possible to develop all of the measures (especially essential fish habitat or EFH) that would be necessary for the FMP not to be deficient if any RH/S species were officially added as stocks in the fishery in this document. Instead, selection of an Alternative Set 9 action alternative would "kick off" another Amendment to fully add stocks to the MSB FMP in a manner that would keep the plan in compliance with the Magnuson Stevens Act. The Act's required provisions for management plans are included below.

5.9.2 General Rationale & Background

Current Management

The Atlantic States Marine Fisheries Commission (Commission) manages RH/S with its Interstate Fishery Management Plan for Shad and River Herring (FMP) under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). Shad and river herring management authority lies with the coastal states and is coordinated through the Commission. Responsibility for compatible management action in the Exclusive Economic Zone (EEZ) from 3-200 miles from shore lies with the Secretary of Commerce through ACFCMA in the absence of a federal fishery management plan. Comprehensive assessments are not currently available for RH/S but most indications point to depressed runs in most river systems.

The ASMFC implemented river herring moratoria for all states on Jan 1, 2012 except those states (e.g. Maine which landed over 1,000,000 pounds of river herring in 2010) that have approved sustainable fishing plans. The ASMFC will have implemented shad moratoria for all states by Jan 1, 2013 except those states have approved sustainable fishing plans. Ocean shad fisheries have been phased out for all states but some in-river fisheries still exits.

The ASMFC 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 fisheries meet this definition of sustainability through the development of sustainability targets which must be achieved and maintained. All river systems are allowed to maintain a catch and release recreational fishery. States and jurisdictions are also required to identify local significant threats to shad critical habitat and develop a plan for mitigation and restoration. Recommendations for river herring habitat improvement have also been approved by the ASMFC.

Approved sustainable fishing plans vary by state and are available by contacting the ASMFC (asmfc.org), but the main point is that by 2013, any state landings of RH/S should be sustainable (ASMFC 2011).

Habitat restoration efforts have focused on improved fish passages around dams and dam removal with 100s of projects completed in that last 25 years. Each project opens up varying additional river miles to anadromous fish passage and spawning (Pers Com Kate Taylor, ASMFC). These are often joint state-federal projects with cooperation between the states, NOAA, U.S. Fish and Wildlife (U.S. F&WS), and private organizations such as American Rivers. Hundreds of millions of dollars have been spent on such activities over the last 25 years (pers com, Larry Miller, U.S. F&WS). Additional information on current RH/S stock status is available in Section 6.2 and detailed information on the RH/S stocks and fisheries is available in the ASMFC's annual RH/S status update, available at: http://www.asmfc.org/shadRiverHerring.htm.

While states cannot make regulations in federal waters (beyond three miles), state requirements can have impacts on federal vessels since vessels must transit state waters to land their fish. It is not entirely clear how impending state moratoria will impact federal vessels since some are just coming online and they may differ between the states. However, some states like Virginia are prohibiting all possession of any river herring in addition. This means that a vessel with incidental river herring catch onboard from fishing in federal waters would be in violation once it entered state waters. Other states, may prohibit retention of river herring caught in state waters but allow transiting. Once the Final EIS is written there should be additional clarity on the various state regulations for 2012.

Magnuson Stevens Act

The Magnuson Stevens Act (MSA) states the following regarding Council responsibilities: "...Each Council shall...for each fishery under its authority that requires conservation and management, prepare and submit to the Secretary (A) a fishery management plan..."

Regarding Councils' authorities, MSA states: "The Mid-Atlantic Fishery Management Council shall consist of the States of New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and North Carolina and shall have authority over the fisheries in the Atlantic Ocean seaward of such States..."

NMFS has published guidelines (available at: http://www.nmfs.noaa.gov/msa2007/catchlimits.htm) in the Federal Register regarding MSA's National Standard 1 (NS1) which states: "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 NS1 Final Rule states: "The relevant Council determines which specific target stocks and/or non-target stocks to include in a fishery." Regarding non-target species like RH/S, the rule states "They may or may not be retained for sale or personal use. Non-target species may be included in a fishery and, if so, they should be identified at the stock level." The rule also describes a concept called ecosystem component species but it is not clear what obligations that would trigger other than standard MSA provisions to reduce bycatch under National Standard 9. Regardless, guidance that ecosystem component species should "Not be likely to become subject to overfishing or overfished... in the absence of conservation and management measures" and "Not generally be retained for sale or personal use" would seem to preclude designation of RH/S as ecosystem component species.

Given the preceding paragraph, it would seem to be at the discretion of the Council whether to adopt RH/S as "stocks" in the fishery within the MSB FMP. Doing so essentially would add RH/S as managed resources just like the squids, mackerel, and butterfish and would trigger requirements including status determination criteria, ACLs/AMs, EFH designations, and rebuilding if necessary.

Given that the Atlantic States Marine Fisheries Commission (ASMFC) already has a plan to manage RH/S, it would appear viable to either continue to address the RH/S incidental catch that occurs in the Councils' existing managed fisheries cooperatively with the ASMFC or to add one or more of the RH/S species to the MSB FMP depending on the Council's judgment about which route will provide for optimal management.

One question that has surfaced repeatedly has been could the Council add river herring or shad as stocks in the fishery but use the ACL/AM flexibility provisions of the NS1 guidance to defer to ASMFC for primary management as the NPFMC is considering for salmon and deferring to Alaska? This could theoretically allow the designation of EFH and result in greater federal resources without having to deal with ACLs for these currently data-poor stocks. There are several key issues however, which become evident when reviewing analysis for updating the NPFMC's salmon plan (http://www.fakr.noaa.gov/npfmc/), where Alaska has primary authority even though it is a federally managed species. First, Alaska has a long history of well-documented successful/sustainable management with salmon. Second, the salmon situation is different in that RH/S landings, and certainly discards, appear not nearly as well documented (especially at the species level) as salmon. Existing or pending ASMFC moratoriums will likely address most of the landings control, but not address discarding in state or Federal fisheries. For these reasons it currently seems likely that the establishment ACLs and AMs would be necessary. This is at least the viewpoint of the Amendment 14 FMAT and NOAA GC, though the Council looks forward to getting additional perspectives on this topic during the public input process.

The ACL flexibility guidelines also still require consistency with Magnuson (alternatives to ACLs/AMs would have to essentially achieve the same results). So even if primary management could be ceded to the ASMFC, the Council's suite of management measures would still have to function as ACLs/AMs. Thus the Council would still have to implement hard caps on its other managed species to control overall catch. Further, even if ASMFC had primary responsibility, the Council would still have to limit incidental catch in its directed fisheries based on the best available science about what catch level is consistent with sustainability and/or rebuilding as well as accounting upfront for whatever catch (landings and/or discards) occurs in state waters. Thus while there might not be ACLs/AMs on paper, the caps on incidental catch in Council-managed fisheries would need to have the same function as ACLs/AMs in order to be consistent with the Magnuson Act and the National Standard One final rule guidelines. Again however, this is the viewpoint of the Amendment 14 FMAT and NOAA GC and the Council looks forward to getting additional perspectives on this topic during the public input process.

If RH/S were added to the MSB FMP, the Magnuson Act states that fishery management plans 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;

(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;

(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;

(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;

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing 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, economic information necessary to meet the requirements of this Act, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

(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;

(7) describe and identify essential fish habitat (EFH) 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;

(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;

(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 analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for—

(A) participants in the fisheries and fishing communities affected by the plan or amendment;

(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;

(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;

(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;

(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;

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

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery and;

(15) establish a mechanism for specifying annual catch limits (ACLs) 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 (AMs).

5.9.3 Management Alternatives

NOTE ON COMBINATIONS: All of the action alternatives in the set could be adopted individually or together.

9a. No-action

Under the no-action alternative, primary RH/S management would continue to rest with the states as coordinated through the ASMFC as described above in section 5.9.2. The states would continue to address catch in state waters and address habitat improvements through collaborative work with NOAA, U.S. F&W Service, and private partners. From the Council perspective, RH/S would continue to be managed as a bycatch species, with bycatch to be minimized to the extent practicable. The Council could also continue to consider discretionary measures designed to reduce retained incidental catch (bycatch is defined as discards in the MSA) as it is doing in Amendment 14.

9b. Add blueback herring as a stock in the MSB FMP.

9c. Add alewife as a stock in the MSB FMP.

9d. Add American shad as a stock in the MSB FMP.

9e. Add hickory shad as a stock in the MSB FMP.

The Council could add none, one, or any combination of these species as "stocks" in the fishery. Selecting any of the action alternatives would result in the Council immediately beginning another amendment to add all of the provisions 1-15 above to the FMP for any species that is added. Such a process would likely take another 1-2 years to complete, with the development of ACLs/AMs (or ACL alternatives) and essential fish habitat designations taking the most time and being the most substantive of those provisions.

If an assessment was available and if it contained accepted reference points, any need for rebuilding that was indicated by those reference points could also lead to major actions.

Since RH/S are already managed by the ASMFC, and since substantial catches of RH/S take place in state waters, the plan would likely have to be a joint plan with the ASMFC. It is possible that the Council could attempt to defer primary management of catches (ACLs) to the ASMFC as discussed below.

Once the species were added through the follow-up amendment, NMFS would begin conducting habitat consultations for any identified EFH for federal and/or federally permitted actions (i.e. non-fishing impacts). An evaluation of fishing activities impacts on RH/S habitat and consideration of measures to minimize such impacts would also take place, possibly in the follow-up amendment or possibly afterward through another action.

In the amendment to implement the MSA provisions for a "stock in the fishery," the Council would have to decide whether to implement standard ACLs with accountability measures or make the case that an alternative equivalent could function as an ACL (this applies to any RH/S species that were added). In the first case, the Council's SSC would have to provide an Acceptable Biological Catch (ABC) (regardless of whether information was available on sustainable catch levels), which would be the ACL,

and then all sources of mortality would have to be accounted for and controlled to ensure that the ACL was not exceeded. Such controls could involve RH/S retention limits, retention prohibitions, and or measures to reduce discards from relevant gear types such that ACLs would not be exceeded.

In the second case, the Council would have to make the case that alternative management measures are taking the place of an ACL, in the way that the North Pacific Fishery Management Council has made the case that Salmon moratoria in certain federal waters plus Alaska's escapement-based management measures effectively create a justifiable alternative approach to Council-derived ACLs/AMs. Their argument hinges on the fact that the State of Alaska monitors catch in all of the salmon fisheries and manages salmon holistically by incorporating all the sources of fishing mortality on a particular stock or stock complex in calculating the escapement goal range. As explained above, overfishing is prevented by in-season monitoring and data collection that indicates when an escapement goal is not being met. When the data indicate low run strength due to natural fluctuations in salmon abundance, Alaska Department of Fish & Game closes the fishery to ensure the escapement goal range is reached. Biological escapement goal (BEG) means the escapement that provides the greatest potential for maximum sustained yield. BEG is the primary management objective for escapement (NPFMC 2011).

In order to pursue a similar path a be consistent with the MSA, it would appear that the Council would have to make that argument that the States were pursuing management based on biologically-based escapement goals and that those goals had taken all sources of mortality into account, including ocean-intercept fishing mortality. This may be problematic especially in states with moratoriums because they do not know the status of their runs (most) – if they do not know the status of their runs it would seem to be difficult to make the case that whatever at-sea mortality occurs has been accounted for and that taking everything into consideration a sustainable outcome would result.

The two ACL/AM approaches described above would be options for the Council to explore if it decided to move forward with adding any RH/S species as stocks in the MSB FMP.

Note: Due to the difficulty in identifying the two river herrings and the two shads in landings data it is assumed that for ACL/AM purposes that they could be addressed together (i.e. a river herring ACL and a shad ACL).

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 111024651–1650–01]

RIN 0648–XA739

Listing Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List Alewife and Blueback Herring as Threatened Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: 90-day petition finding; request for comments.

SUMMARY: We, NMFS, announce a 90-day finding for a petition to list alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) as threatened under the Endangered Species Act and to designate critical habitat concurrent with a listing. We find that the petition presents substantial scientific information indicating the petitioned action may be warranted. Accordingly, we will conduct a review of the status of alewife and blueback herring, collectively referred to as river herring, to determine if the petitioned action is warranted. To ensure that the review is comprehensive, we solicit information pertaining to this species from any interested party.

DATES: Information related to this petition finding must be received by January 3, 2012.

ADDRESSES: You may submit comments, identified by the RIN 0648–XA739, by any of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal *http//www.regulations.gov.* Follow the instructions for submitting comments.
- *Mail or hand-delivery:* Assistant Regional Administrator, NMFS, Northeast Regional Office, 55 Great Republic Drive, Gloucester, MA 01930.

All comments received are a part of the public record and will generally be posted to *http://www.regulations.gov* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information.

NMFS will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF file formats only.

The petition and other pertinent information are also available electronically at the NMFS Web site at *http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/RiverHerringSOC.htm.*

FOR FURTHER INFORMATION CONTACT: Kim Damon-Randall, NMFS, Northeast Regional Office (978) 282–8485 or Marta Nammack, NMFS, Office of Protected Resources (301) 713–1401.

SUPPLEMENTARY INFORMATION:

Background

On August 5, 2011, we, the National Marine Fisheries Service (NMFS), received a petition from the Natural Resources Defense Council (NRDC), requesting that we list alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) each as threatened throughout all or a significant portion of their range under the Endangered Species Act (ESA). In the alternative, they requested that NMFS designate distinct population segments (DPS) of alewife and blueback herring as specified in the petition (Central New England (CNE), Long Island Sound (LIS), Chesapeake Bay (CB) and Carolina for alewives, and CNE, LIS, and CB for blueback herring). The petition contains information on the two species, including the taxonomy; historical and current distribution; physical and biological characteristics of the species' habitat and ecosystem relationships; population status and trends; and factors contributing to the species' decline. NRDC also included information regarding the possible DPSs of alewife and blueback herring as described above. The petition addresses the five factors identified in section 4(a)(1) of the ESA: (1) Present or threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or man-made factors affecting the species' continued existence.

ESA Statutory Provisions and Policy Considerations

Section 4(b)(3)(A) of the ESA (16 U.S.C. 1533(b)(3)(A)) requires that we make a finding as to whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating the petitioned action may be warranted. ESA implementing regulations define substantial information as the amount of information that would lead a reasonable person to believe the measure proposed in the petition may be warranted (50 CFR 424.14(b)(1)). In determining whether substantial information exists for a petition to list a species, we take into account several factors, including information submitted with, and referenced in, the petition and all other information readily available in our files. To the maximum extent practicable, this finding is to be made within 90 days of the receipt of the petition (16 U.S.C. 1533(b)(3)(A)), and the finding is to be published promptly in the **Federal Register**. If we find that a petition presents substantial information indicating that the requested action may be warranted, section 4(b)(3)(A) of the ESA requires the Secretary of Commerce (Secretary) to conduct a review of the status of the species. Section 4(b)(3)(B) requires the Secretary to make a finding as to whether the petitioned action is warranted within 12 months of the receipt of the petition. The Secretary has delegated the authority for these actions to the NOAA Assistant Administrator for Fisheries.

The ESA defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range (ESA section 3(6))." A threatened species is defined as a species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (ESA section 3(19))." As stated previously, under section 4(a)(1) of the ESA, a species may be determined to be threatened or endangered as a result of any one of the following factors: (1) Present or threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting its continued existence. Listing determinations are made solely on the basis of the best scientific and commercial data available, after conducting a review of the status of the species and taking into account efforts made by any state or foreign nation to protect such species.

Under the ESA, a listing determination can address a species, subspecies, or a DPS of a vertebrate species (16 U.S.C. 1532 (16)). NRDC presents information in the petition proposing that DPSs of alewife and blueback herring are present in the United States and indicating that it may be appropriate to divide the population

into DPSs of alewife and blueback herring as specified in the petition. If we find that listing at the species level is not warranted, we will determine whether any populations of these species meet the DPS policy criteria, and if so, whether any DPSs are endangered or threatened under the ESA.

Life History of Alewife and Blueback Herring

Alewife and blueback herring are collectively referred to as "river herring." Due to difficulties in distinguishing between the species, they are often harvested together in commercial and recreational fisheries, and managed together by the Atlantic States Marine Fisheries Commission (ASMFC). Throughout this finding, where there are similarities, they will be collectively referred to as river herring, and where there are distinctions they will be identified by species.

River herring can be found along the Atlantic coast of North America, from the maritime provinces of Canada to the southeastern United States (Mullen *et al.*, 1986; Shultz *et al.*, 2009). The coastal ranges of the two species overlap, with blueback herring found in a greater and more southerly distribution ranging from Nova Scotia down to the St. John's River, Florida; and alewife found in a more northerly distribution, from Labrador and Newfoundland to as far south as South Carolina, though the extreme southern range is a less common occurrence (Collette and Klein-MacPhee, 2002; ASMFC, 2009a; Kocik *et al.*, 2009). Adults are most often found at depths less than 100 m (328 ft) in waters along the continental shelf (Neves, 1981; ASMFC, 2009a; Shultz *et al.*, 2009).

River herring have a deep and laterally compressed body, with a small, pointed head with relatively large eyes, and a lower jaw that protrudes further than the upper jaw (Collette and Klein-MacPhee, 2002). The dorsal fin is small and slightly concave, pelvic fins are small, pectorals are moderate and low on the body, and the caudal fin is forked (Collette and Klein-MacPhee, 2002).

The coloring varies, ranging from dark blue and bluish green to grayish green and bluish gray dorsally; and silvery with iridescence in shades of green and violet on the sides and abdomen. In adults, there is often a dusky spot that is located at eye level on both sides behind the margin of the gill cover. The colors of alewife are thought to change in shade according to substrate as the fish migrates upstream, and sea run fish are thought to have a golden cast to their coloring (Collette and Klein-MacPhee, 2002).

Blueback herring and alewife are similar in appearance; however, there are some distinguishable characteristics: Eye diameter and the color of the peritoneum. The eye diameter with alewives is relatively larger than that of blueback herring. In blueback herring, the snout length is generally the same as the eye diameter; however with alewives, the snout length is smaller than the diameter of the eye (Collette and Klein-MacPhee, 2002). In alewives, the peritoneum is generally pale/light gray or pinkish white, whereas the peritoneum in blueback herring is generally dark colored and either brown or black, and sometimes spotted (Collette and Klein-MacPhee, 2002; ASMFC, 2009a).

River herring are anadromous, meaning that they migrate up coastal rivers in the spring from the marine environment, to estuarine and freshwater rivers, ponds, and lake habitats to spawn (Collette and Klein-MacPhee, 2002; ASMFC, 2009a; Kocik *et al.*, 2009). They are highly migratory, pelagic, schooling species, with seasonal spawning migrations that are cued by water temperature (Collette and Klein-MacPhee, 2002; Schultz, 2009). Depending upon temperature, blueback herring typically spawn from late March through mid-May. However, they have been documented spawning in the southern parts of their range as early as December or January, and as late as August in the northern range (ASMFC, 2009a). Alewives generally migrate earlier than other alosine fishes, but have been documented spawning as early as February to June in the southern portion of their range, and as late as August in the northern portion of the range (ASMFC, 2009a). It is thought that river herring return to their natal rivers for spawning, and do exhibit natal homing. However, colonization of streams where river herring have been extirpated has been documented; therefore, some effective straying does occur (ASMFC, 2009a).

Throughout their life cycle, river herring use many different habitats ranging from the ocean, up through estuaries and rivers, to freshwater lakes and ponds. The substrate preferred for spawning varies greatly and can include substrates consisting of gravel, detritus, and submerged aquatic vegetation. Blueback herring prefer swifter moving waters than alewife (ASMFC, 2009a). Nursery areas can include freshwater and semi-brackish waters; however, little is known about their habitat preference in the marine environment (Meadows, 2008; ASMFC, 2009a).

Analysis of Petition and Information Readily Available in NMFS Files

In the following sections, we use the information presented in the petition and in our files to: (1) Describe the distribution of alewife and blueback herring; and (2) evaluate whether alewife and blueback herring are at abundance levels that would lead a reasonable person to conclude that listing under the ESA may be warranted due to any of the five factors listed under section 4(a)(1) of the ESA.

Abundance

The NRDC asserts that alewife and blueback herring populations have suffered dramatic declines over the past 4 decades (ASMFC, 2008). The NRDC cites the ASMFC as stating that alewife and blueback herring harvest averaged almost 43 million pounds (19,504 metric tons (mt)) per year from 1930 to 1970. NRDC also cites ASMFC (2008) in stating that peak harvest occurred in the late 1940s and early 1950s and was highest in Virginia and North Carolina. The NRDC notes that commercial landings of river herring began declining sharply coastwide in the 1970s. However, ASMFC (2009a) reports that 140 million pounds (63,503 mt) of river herring were commercially landed in 1969, marking the peak in river herring catch; this is a discrepancy from what is stated in the petition. From the peak landings in 1969, landings declined to a point where domestic landings recently (2000–2007) exceeded only 2 million pounds (907 mt) yearly (ASMFC, 2009a). Declines in catch per unit effort (CPUE) have also been observed in two rivers for blueback herring and for alewife, and declining trends in CPUE for the combined species were also observed in two out of three rivers examined (ASMFC, 2009a).

ASMFC (2009a) also reports declines in abundance through run size estimates for river herring combined, as well as for individual species of alewife and blueback herring. Abundance declined in seven out of fourteen rivers in New England from the late 1960s to 2007, with no obvious signs of recovery; however, since 2004, there have been some signs of recovery in five out of fourteen rivers (ASMFC, 2009a). Coastwide declines have been observed, particularly in southern New England (Davis and Schultz *et al.*, 2009). In the Connecticut River the number of blueback herring passing Holyoke Dam declined from 630,000 in 1985 to a low of 21 in 2006 (Schultz *et al.*, 2009).

ESA Section 4(a)(1) Factors

Present or Threatened Destruction, Modification or Curtailment of Habitat or Range

In the petition, the NRDC states that habitat alterations, loss of habitat, and impaired water quality have contributed to the decline of river herring since colonial times. NRDC further states that climate change now poses an increasing threat as well. NRDC states that dams and turbines block access to spawning and foraging habitat, may directly injure or kill passing fish, and change water quality through alterations in flow and temperature, which NRDC asserts is significantly impacting river herring. NRDC cites ASMFC (2009b) which indicates that flow variations caused by dams, particularly hydropower dams, can displace eggs as well as disrupt migration patterns, which will adversely affect the survival and productivity of all life stages of river herring as well as other anadromous fish. ASMFC (2009b) indicates that increased flows at dams with fishways can also adversely affect the upstream migration of adults, impeding their ability to make it up through the fishway, as well as the downstream migration of juveniles, causing an early downstream migration and higher flows through sluiceways resulting in mortality. According to NRDC, dams have caused river herring to lose access to significant portions of their spawning and foraging habitat. In addition to altering flow and changing environmental parameters such as temperature and turbidity, NRDC indicates that dams, particularly hydropower dams, cause direct mortality to various life stages of river herring through entrainment and impingement in turbines, and changing water pressures. In addition, NRDC states that turbines used in tidal hydroelectric power plants may impact river herring with each tidal cycle as the fish migrate through the area.

Dredging and blasting were also identified by NRDC as significant threats to river herring. The petition cites ASMFC (2009b), asserting that increased suspended sediment, changes in water velocities, and alteration of substrates through dredging can directly impact river herring habitat. In addition, NRDC asserts that these operations may affect migration patterns and spawning success, and they can directly impact gill tissues, producing near fatal effects (NMFS, 1998; ASMFC, 2009b).

The NRDC also asserts that water quality poses a significant threat to river herring through changes in water temperature and flow, introduction of toxic pollutants, discharge, erosion, and nutrient and chemical run-off (ASMFC, 2009b). NRDC states that "poor water quality alone can significantly impact an entire population of alewife or blueback herring." ASMFC (2008) notes that significant declines in dissolved oxygen (DO) levels in the Delaware River during the 1940s and 1950s from heavy organic loading made portions of the river during the warmer months of the year uninhabitable to river herring. ASMFC (2008, 2009a) indicates that river herring abundance is significantly affected by low DO and hypoxic conditions in rivers and that these conditions may also prevent spawning migrations.

River herring susceptibility to toxic chemicals and metals was also identified by NRDC as a threat to the species. The NRDC asserts that river herring are subjected to contaminants through their habitat, which may be contaminated with dioxins, polychlorinated aromatic hydrocarbons, organophosphate and organochlorine pesticides, polychlorinated biphenyls, and other hydrocarbon compounds, as well as toxic metals. Citing ASMFC (1999), the NRDC states that because of industrial, residential, and agricultural development, heavy metal and various types of organic chemical pollution has increased in nearly all estuarine waters along the Atlantic coast, including river herring spawning and nursery habitat. NRDC asserts that these contaminants can directly impact fish through reproductive impairment, reduced survivorship of various life stages, and physiological and behavioral changes (ASSRT, 2007; 75FR 61872).

The NRDC also identified climate change as a threat to river herring habitat. According to NRDC, the spatial distribution, migration, and reproduction of alewife may be affected through rising water temperatures caused by climate change. Citing the International Panel on Climate Change (IPCC) (2001), NRDC states that fish larvae and juveniles may have a high sensitivity to water temperature and suggests that headwaters and rivers may be more vulnerable; thus, the effects of climate change may be more significant to anadromous species, which utilize a multitude of habitats. According to ASMFC (2009b), as water temperatures rise, the upstream spawning migration of alewife declines, and will mostly cease once temperatures have risen above 21 degrees Celsius. In addition to increasing water temperatures, climate change may affect river herring through increased precipitation that may affect rivers and estuaries along the coast. Citing Kerr *et al.* (2009), the NRDC reports that a 10 percent increase in annual precipitation is expected in the Northeast United States from 1990 to 2095 and that precipitation has already increased 8 percent over the past 100 years (Markham and Wake, 2005). As increased water flows may affect anadromous fish migration, increased precipitation and the potential for flooding in rivers due to climate change may pose a significant threat to river herring (Limburg and Waldman, 2009).

Overutilization for Commercial, Recreational, Scientific or Education Purposes

The NRDC identified direct harvest, bycatch, and incidental catch as significant threats to river herring. River herring were historically fished through inshore fisheries, and constitute one of the oldest fisheries in North America (Haas-Castro, 2006). Commercial landings of river herring reached nearly 34,000 metric tons (mt) in the 1950s, but in the 1970s, landings fell below 4,000 mt. According to ASMFC (2008), foreign commercial exploitation of river herring in the 1960s led to drastic declines in abundance of river herring. Annual commercial landings over the past decade have varied from 137 mt to 931 mt, and 90 percent of this catch was typically harvested by Maine, North Carolina, and Virginia fisheries (Haas-Castro, 2006). Historically, river herring were targeted for food, bait and fertilizer purposes; however, they are currently most often used for bait in commercial fisheries (Collette and Klein-MacPhee, 2002). The NRDC contends that declines in river herring abundance are greatly affected by commercial overharvest, noting that direct harvest of river herring currently takes place in Maine, New Hampshire, New York, New Jersey, some rivers in Delaware, Maryland, Virginia, and South Carolina.

Bycatch and incidental catch were also identified by NRDC as resulting in significant mortality of river herring, stating that this catch occurs in both state and Federal waters. NRDC asserts that the anadromous life history of river herring presents the potential for increased bycatch due to the species schooling behavior at congregation sites throughout different portions of migration. Citing Lessard and Bryan (2011), NRDC indicates that "hot spots" of bycatch and incidental catch have been found in the winter between Cape Cod and Cape Hatteras, in the spring with blueback herring in the southern region, and in the fall in the Gulf of Maine and Georges Bank. The NRDC states that a variety of sources including landings records, log books, portside sampling efforts, and the NMFS observer program provide information

on bycatch and incidental catch, asserting that most of these sources are likely to underestimate the amount of bycatch that occurs.

The NRDC cites Lessard and Bryan (2011) in stating that the majority of bycatch of river herring is taken with mid-water otter paired trawls, and that catch with this gear type appears to be increasing from 2000–2008, with an estimation of around 500,000 to 2.5 million pounds (227 to 1,134 mt) of river herring caught annually as bycatch. In addition, the NRDC asserts that the Atlantic herring and Atlantic mackerel fisheries are increasing their use of single and pair mid-water trawls, and are using larger, more efficient nets, increasing the effort and efficiency in this fishery. The petition further outlines specific overharvesting issues within the Damariscotta, Hudson, Delaware, Potomac, Chowan, Santee-Cooper, and the St. John's Rivers, as well as Chesapeake Bay and Albermarle Sound.

Predation and Disease

The NRDC identifies predation and disease as another threat facing river herring. Citing the Maine Department of Marine Resources (ME DMR) (2003), NRDC states that river herring may be preyed upon by striped bass, bluefish, tuna, cod, haddock, halibut, American eel, brook trout, rainbow trout, brown trout, lake trout, landlocked salmon, smallmouth bass, largemouth bass, pickerel, pike, white and yellow perch, seabirds, bald eagle, osprey, great blue heron, gulls, terns, cormorants, seals, whales, otter, mink, fox, raccoon, skunk, weasel, fisher, and turtles. It asserts that the decline of some populations of river herring is due to increased predation, citing ASMFC (2008) as noting a concern with increasing striped bass abundance, and identifying predation by striped bass as contributing significantly to the decline of river herring in some rivers. Additionally, many species of cormorants along the coast are increasing in abundance, and predation on alosines by cormorants has been increasing, although Dalton *et al.* (2009) suggested that the double-crested cormorant is not believed to pose an immediate threat to the recovery of alewife in Connecticut.

According to the NRDC, significant cumulative mortality can occur with viral hemorrhagic septicemia, which is a viral infection known to infect certain anadromous fish, including river herring. Additionally, NRDC asserts that when levels of suspended solids are present during spawning, alewife eggs are significantly more likely to contract a naturally occurring fungus infection.

Inadequacy of Existing Regulatory Mechanisms

The NRDC states that state and Federal regulatory mechanisms are insufficient and contributing to drastic declines in river herring populations that continue throughout all or a significant portion of the species' ranges. Due to difficulties in distinguishing between the species, alewife and blueback herring are managed together by the ASMFC as river herring. NRDC states that ASMFC has the authority to develop and issue interstate fishery management plans (FMP) for fisheries administered by the state agencies and will coordinate management with Federal waters.

According to NRDC, ASMFC adopted an amendment to the coast-wide FMP for American shad and river herring in 2009, to specifically address the declining river herring populations coastwide. The petition asserts that this amendment is not likely to protect river herring sufficiently, as it "does not require, and is not likely to result in, adequate measures to reduce significant incidental catch and bycatch/bycatch mortality of these species, particularly in federal waters." NRDC also asserts that this amendment does not address non-fishing stressors on river herring sufficiently. The petition further states that four states have already had prohibitions on the harvest of river herring in place, and even with this prohibition on all harvest, these states have continued to see declines.

The petition notes that river herring are not subject to the requirements and protections of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) because they are not currently managed under an FMP as a stock, and therefore, are not federally managed in regard to overfishing and depleted stocks under the MSA. Even though river herring are caught and sold as bycatch, and FMPs are meant to minimize bycatch, the NRDC asserts that any provisions in FMPs meant to address bycatch of river herring have proven to be ineffective and inadequate. NRDC further asserts that bycatch reporting is inadequate and limited and that there are currently no FMPs under the MSA that specifically address bycatch and bycatch mortality of river herring.

The NRDC notes that currently the Mid-Atlantic Fisheries Management Council (MAFMC) is developing two amendments to two separate FMPs that include proposals for improving the monitoring of bycatch of river herring in these fisheries; however, it asserts that it was unknown whether the bycatch monitoring measures for river herring would be included in the final amendment.

NRDC also indicates that under the MSA or the Atlantic Coast Fisheries Act, NMFS has the potential to initiate emergency rulemaking or other actions to reduce bycatch of river herring in small mesh fisheries, but has declined to do so thus far. NRDC further notes that NMFS has declined to take emergency rulemaking actions for bycatch of river herring in small-mesh fisheries in New England and the Mid-Atlantic.

Federally managed stocks are required to have essential fish habitat (EFH) designated under the MSA; however, since river herring are not considered a federally managed stock under the MSA, EFH has not been designated for this species. A provision under the 1996 amendments to the MSA provides for comments from regional councils on activities that may affect anadromous fish habitat; however, the NRDC asserts that this provision has not provided any significant modifications to activities affecting anadromous fish habitat.

In addition to fisheries, the petition indicates that Federal laws and regulations have also failed to protect river herring and their habitat from threats such as poor water quality, dredging, and altered water flows. The petition briefly describes the Clean Water Act (CWA), the Federal Power Act (FPA), and the Anadromous Fish Conservation Act, and identifies where these regulations present inadequacies that are failing to protect river herring. NRDC notes that the CWA should limit discharge of pollutants into navigable waters and that some progress has been made in terms of industrial sources. NRDC also concludes that the CWA has not "adequately regulated nutrients and toxic pollutants originating from non-point sources." In addition, some permits for dredging and excavation require permitting from the Army Corps of Engineers, and NRDC notes that these may benefit river herring through placing restrictions on the timing and location of activities in river herring habitats. The FPA allows for protection of fish and wildlife that may be affected by hydroelectric facilities. As mentioned previously, NRDC asserts that fish passage at hydroelectric facilities can be inefficient, and the dams themselves affect water flow which can pose a significant threat to river herring. Thus, according to NRDC, FPA protections for river herring are inadequate. The NRDC further states that the Anadromous Fish Conservation Act does not require any measures for river herring that would improve

habitat, reduce bycatch, or mitigate other threats to river herring, and therefore provides inadequate protection for the species. The NRDC notes that there are Federal protections that may benefit river herring which are intended for other anadromous species such as Atlantic salmon and shortnose sturgeon; however, it asserts that any benefits from these protections are minor and insufficient to fully protect river herring.

Other Natural or Manmade Factors Affecting Its Existence

The petition describes other natural or manmade factors that may be affecting river herring, including invasive species, impingement, entrainment, and water temperature alterations. The petition states that invasive species may threaten food sources for alewives and blueback herring. ASMFC (2008) describes the negative effect zebra mussel introduction to the Hudson River had on phytoplankton and zooplankton, and subsequently water quality. According to ASMFC (2008), a decrease in both micro and macro zooplankton as well as phytoplankton improved water clarity and increased shallow water zoobenthos by 10 percent. Early life stages of river herring feed on zooplankton as well as phytoplankton (ASMFC, 2008). Strayer *et al.* (2004) hypothesized that the introduction of this invasive species created competition for availability of the preferred food source of early life stages of river herring, and found that larval river herring abundance decreased with increased zebra mussel presence. Thus, according to the petition, invasive species introduction and subsequent water quality changes which may affect plankton abundance can decrease the abundance of early life stages of river herring.

As described previously, the petition asserts that various life stages of river herring may be impinged or entrained through water intake structures from commercial, agricultural, or municipal operations. These intake structures alter flow, and may cause direct mortality to various life stages of river herring if they are impinged or entrained by the intake. In addition, aside from direct mortality, the petition asserts that intakes alter flow, which can affect water quality, temperature, substrate, velocity, and stream width and depth. NRDC suggests that these alterations can affect spawning migrations as well as spawning and nursery habitat, which could pose a significant threat to river herring.

Petition Finding

Based on the above information, which indicates ongoing multiple threats to both species as well as potential declines in both species throughout their ranges, and the criteria specified in 50 CFR 424.14(b)(2), we find that the petition presents substantial scientific and commercial information indicating that the petitioned action concerning alewife and blueback herring may be warranted. Under section 4(b)(3)(A) of the ESA, this positive 90-day finding requires NMFS to commence a status review of the species. During our status review, we will review the best available scientific and commercial information, including the effects of threats and ongoing conservation efforts on both species throughout their ranges. Alewife and blueback herring are now considered to be candidate species (69 FR 19976; April 15, 2004). Within 12 months of the receipt of the petition (August 5, 2011), we will make a finding as to whether listing alewife and/or blueback herring as endangered or threatened is warranted, as required by section 4(b)(3)(B) of the ESA. If listing these species is not warranted, we will determine whether any populations of these species meet the DPS policy criteria (61 FR 4722; February 7, 1996), and if so, whether any DPSs are endangered or threatened under the ESA. If listing either species (or any DPS) is warranted, we will publish a proposed listing determination and solicit public comments before deciding whether to publish a final determination to list them as endangered or threatened under the ESA.

References Cited

A complete list of the references used in this finding is available upon request (see **ADDRESSES**).

Information Solicited

To ensure the status review is based on the best available scientific and commercial data, we solicit information pertaining to alewife and blueback herring. Specifically, we solicit information in the following areas: (1) Historical and current distribution and abundance of these species throughout their ranges; (2) population status and trends; (3) any current or planned activities that may adversely impact these species, especially as related to the five factors specified in section 4(a)(1) of the ESA and listed above; (4) ongoing efforts to protect and restore these species and their habitat; and (5) any biological information (life history, morphometrics, genetics, etc.) on these species. We request that all information be accompanied by: (1) Supporting documentation such as maps and bibliographic references; and (2) the submitter's name, address, and any association, institution, or business that the person represents.

Peer Review

On July 1, 1994, NMFS, jointly with the U.S. Fish and Wildlife Service, published a series of policies regarding listings under the ESA, including a policy for peer review of scientific data (59 FR 34270). OMB issued its Final Information Quality Bulletin for Peer Review on December 16, 2004. The Bulletin became effective on June 16, 2005, and generally requires that all "influential scientific information" and "highly influential scientific information" disseminated on or after that date be peer reviewed. The intent of the peer review policy is to ensure that decisions are based on the best scientific and commercial data available. Independent peer reviewers will be selected to review the status review report from the academic and scientific community, tribal and other Native American groups, Federal and state agencies, the private sector, and public interest groups.

Authority: 16 U.S.C. 1531 *et seq.*

Dated: October 27, 2011.

John Oliver,

Deputy Assistant Administrator for Operations, National Marine Fisheries Service.

[FR Doc. 2011–28430 Filed 11–1–11; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 622

[Docket No. 100217095–1652–02]

RIN 0648–AY56

Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Reef Fish Fishery of the Gulf of Mexico; Amendment 32

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

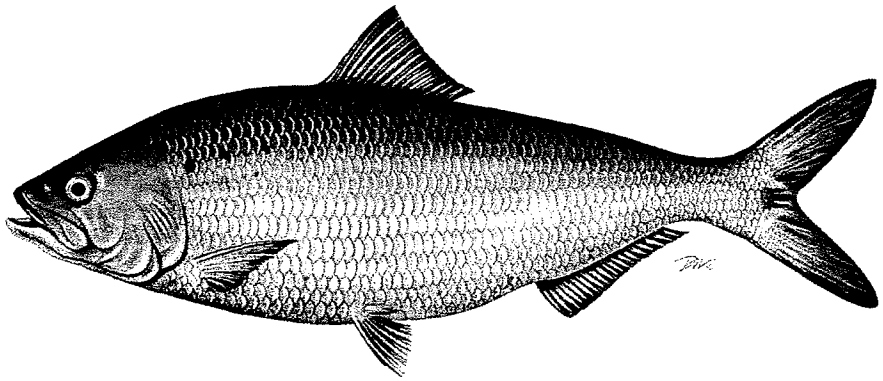
ACTION: Proposed rule; request for comments.

SUMMARY: NMFS proposes to implement management measures described in Amendment 32 to the Fishery Management Plan for the Reef Fish

Stock Assessment Report No. 07-01
of the

Atlantic States Marine Fisheries Commission

Terms of Reference & Advisory Report
to the American Shad Stock Assessment Peer Review



August 2007

Working towards healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015

Stock Assessment Report No. 07-01
of the

Atlantic States Marine Fisheries Commission

Terms of Reference & Advisory Report
to the American Shad Stock Assessment Peer Review

Conducted on
July 16-20, 2007
Alexandria, Virginia

Prepared by the
ASMFC American Shad Stock Assessment Peer Review Panel

Dr. Karin Limburg, Panel Chair, State University of New York
Dr. Jamie Gibson, Department of Fisheries and Oceans, Canada
Dr. Bill Pine, University of Florida
Dr. Terrance Quinn, University of Alaska
Dr. Norma Jean Sands, National Marine Fisheries Service

A publication of the Atlantic States Marine Fisheries Commission pursuant to National Oceanic and Atmospheric Administration Award No. NA05NMF4741025



Table of Contents

TABLE OF CONTENTS ii

PREFACE iii

ACKNOWLEDGEMENTS v

INTRODUCTION 1

TERMS OF REFERENCE FOR THE AMERICAN SHAD STOCK ASSESSMENT PEER REVIEW 2

A. Compile and Determine Adequacy of Available Life History Data for Each Stock 2
B. Compile and Determine Adequacy of Available Fishery-Dependent and/or Independent Data as Indices of Relative Abundance for Each Stock. 5
C. Determine Most Appropriate Method of Estimating Natural Mortality. 6
D. Determine Which Assessment Analyses are Most Appropriate to Available Data for Each Stock. Assessment Methods Will Range from Simple Trend Analysis to More Complex Models. 7
E. Estimate Biological Reference Points for Each Stock Where Possible. 9
F. Determine Current Status of Each Stock Where Possible 14
G. Develop Recommendations for Needed Monitoring Data and Future Research. 16
H. Describe the Locations and Amounts of Shad And River Herring Bycatch in Commercial Fisheries for Mackerel, Sea Herring, and Other Pelagic Species and Estimate the Contribution of that Bycatch to Fishing Mortality. 18

ADVISORY REPORT 19

A. Stock Status 19
B. Stock Identification and Distribution 19
C. Management Unit 20
D. Landings 20
E. Data and Assessment 20
F. Biological Reference Points 20
G. Fishing Mortality 20
H. Recruitment 21
I. Spawning Stock Biomass 21
J. Bycatch 22
K. Other Comments 22
L. Perspectives 22
M. Sources of Information (Literature Cited) 28

Preface

Summary of the ASMFC Peer Review Process

The Stock Assessment Peer Review Process, adopted in October 1998 and revised in 2002 and 2005 by the Atlantic States Marine Fisheries Commission (ASMFC or Commission), was developed to standardize the process of stock assessment reviews and validate the Commission's stock assessments. The purpose of the peer review process is to: (1) ensure that stock assessments for all species managed by the Commission periodically undergo a formal peer review; (2) improve the quality of Commission stock assessments; (3) improve the credibility of the scientific basis for management; and (4) improve public understanding of fisheries stock assessments. The Commission stock assessment review process includes an evaluation of input data, model development, model assumptions, scientific advice, and a review of broad scientific issues, where appropriate.

The Benchmark Stock Assessments: Data and Assessment Workshop and Peer Review Process report outlines options for conducting an external peer review of Commission managed species. These options are:

1. The Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) conducted by the National Marine Fisheries Service (NMFS), Northeast Fisheries Science Center (NEFSC).
2. The Southeast Data and Assessment Review (SEDAR) conducted by the National Marine Fisheries Service, Southeast Fisheries Science Center (SEFSC).
3. The Transboundary Resources Assessment Committee (TRAC) reviews stock assessments for the shared resources across the USA-Canada boundary and is conducted jointly through the National Marine Fisheries Service and the Canada Department of Fisheries and Oceans (DFO).
4. A Commission stock assessment Peer Review Panel conducted by 3-5 stock assessment biologists (state, federal, university). The Commission Review Panel will include scientists from outside the range of the species to improve objectivity.
5. A formal review using the structure of existing organizations (i.e. American Fisheries Society, International Council for Exploration of the Sea, or the National Academy of Sciences).

Twice annually, the Commission's Interstate Fisheries Management Program (ISFMP) Policy Board prioritizes all Commission managed species based on species management board advice and other prioritization criteria. The species with highest priority are assigned to a review process to be conducted in a timely manner.

In July 2007, the Commission convened a Stock Assessment Peer Review Panel comprised of members with an expertise in stock assessment methods and/or anadromous species and their life history. The review for the American shad stock assessment was conducted at the Crowne Plaza Hotel in Alexandria, Virginia from July 16 - 20, 2007. Prior to the Review Panel meeting, the Commission provided the Review Panel Members with an electronic and hard copy of the 2007 American Shad Stock Assessment Report.

The review process consisted of an introductory presentation of the completed 2007 stock assessments by river system. Each presentation was followed by general questions from the Panel. The final two days involved a closed-door meeting of the Review Panel during which the documents and presentations were reviewed and a report prepared.

The report of the Review Panel is structured to closely follow the terms of reference provided to the stock assessment team.

Acknowledgements

The Atlantic States Marine Fisheries Commission thanks all of the individuals who contributed to the development of the American Shad Stock Assessment Report and the Terms of Reference and Advisory Report. The Commission extends its appreciation to the members of the American Shad Stock Assessment Peer Review Panel (Dr. Karin Limburg - Chair, State University of New York College of Environmental Science and Forestry; Dr. Jamie Gibson, Canada's Department of Fisheries and Oceans; Dr. Bill Pine, University of Florida; Dr. Terrance Quinn, University of Alaska; and Dr. Norma Jean Sands, National Marine Fisheries Service, Northwest Fisheries Science Center) for their efforts to evaluate the stock assessment and developing this Terms of Reference and Advisory Report.

The Commission and American Shad Peer Review Panel thank the ASMFC American Shad Technical Committee and Stock Assessment Subcommittee (SASC) members who developed the consensus stock assessment report, especially Andy Kahnle (New York Department of Environmental Conservation) for his dedication to the completion of the stock assessment, serving as Chair of the SASC, and presenting the report to the American Shad Peer Review Panel. We would also like to thank Russ Allen, New Jersey Department of Environmental Protection; Kathy Hattala, New York Department of Environmental Conservation; Michael Hendricks, Pennsylvania Fish & Boat Commission; Patrick Kilduff, Atlantic States Marine Fisheries Commission; John Olney, Virginia Institute of Marine Science; and Bob Sadzinski, Maryland Department of Natural Resources for their useful and clear presentations on the state-specific data and assessments.

The American Shad Peer Review Panel would like to thank Erika Robbins, Melissa Paine, Dr. Genny Nesslage, and Megan Caldwell from the ASMFC for logistical and administrative support during the peer review and preparation of the report.

Introduction

The American shad was, historically, one of the most important exploited fish species in North America (Stevenson 1899; Limburg et al. 2003). In the late 19th century, annual harvests reached over 50 million pounds (22.7 x 10^3 mt). Since then, the stocks declined due to a combination of overfishing, pollution, and habitat loss due to dam construction; over 4,000 km of spawning habitat have been lost (Limburg et al. 2003). In recent years, coastwide harvests are on the order of 500-900 mt, nearly two orders of magnitude lower than in the late 19th century.

The stocks of American shad in their native range along the North American East Coast are currently at all-time lows. The Shad and River Herring Technical Committee of ASMFC undertook the fourth assessment of American shad in 2007, through the Stock Assessment Subcommittee (SASC). Earlier assessments were conducted in 1984, 1988 and 1998 (ASMFC 1985, 1988, 1998).

The current assessment contains an extensive compilation of data from many sources and examines status at the river-stock level from some 30 different stocks. The SASC was mandated to use an inclusive, stakeholder-based approach. Hence, the SASC obtained its data from all local, regional, and federal management agencies, and used information from independently funded academic studies as well. The result was a 1,200+ page document; certainly one of the most comprehensive collections of fisheries related data ever assembled for this species.

This review contains a careful examination of eight Terms of Reference (TORs), i.e., information goals and analyses, to which the American shad SASC had committed. An Advisory Report follows our review of the TORs. We have included a new section in the Advisory Report called "Perspectives" because of the availability of long-term data and historical accounts that allow us to speculate on what the unexploited stocks may have looked like, and to help us interpret the "shifting baseline" (Pauly 1995) phenomenon as it applies to American shad. Several sentences found throughout the document are bolded to add emphasis.

The Review Panel commends the SASC for a well-organized, well-developed, and thoughtful report. The SASC worked hard to separate out "the hard facts" from more speculative analyses and more creative modeling. The members of the SASC are to be commended for their careful and cautious approach. The SASC is also to be commended for taking "the long view" where possible, in order to incorporate much historical information and give perspective to the current assessment.

American Shad Peer Review Panel:

Karin Limburg, State University of New York (Chair)
Jamie Gibson, DFO Canada
Bill Pine, University of Florida
Terry Quinn, University of Alaska – Fairbanks
Norma Jean Sands, NOAA Northwest Fisheries Science Center

Terms of Reference for the American Shad Stock Assessment Peer Review

A. Compile and determine adequacy of available life history data for each stock

The American Shad SASC compiled data from a wide range of state and federal sources. Life history and biological data included age, age-at-maturity, and number of previous spawnings (from scale analyses), length-at-age, weight-at-age, growth parameters (using von Bertalanffy or Gompertz models), fecundity (mostly from studies conducted in the 1950s), and natural mortality estimates. Other parameters included juvenile (mostly young-of-year, but also age-1) abundance indices and in some cases juvenile lengths. Table 1 lists some of the relevant indices that were compiled into the assessment report. Dams are noted because of their importance as an impediment to migration and also as a source of mortality, if passageways are in use.

The SASC did a highly commendable job at compiling the available data. It also scrutinized the data and commented on the quality of the data for each stock. The Panel did well with size-at-age analyses where the age data were reliable. The SASC also identified problems with sample size and design of monitoring, issues that are complicated because of shad's use of multiple spawning habitats along the length of natal river systems, and which can be further exacerbated by hydrology (floods and droughts).

A fundamental issue that hinders the assessments is that aging is very difficult for some of the American shad stocks. An ASMFC-sponsored scale aging workshop (using known-age scales from the Delaware River) revealed that scale readers with long experience tended to under-estimate the ages of older fish (McBride et al. 2005). Besides under-aging, scale erosion during the spawning run can sometimes extend back beyond previous spawning marks. Scales are metabolically active, and in cases where fish migrate long distances in unidirectional flows, such as the Delaware River, scales become quite eroded, presumably as they are "mined" for calcium.

The SASC and Technical Committee are well aware of the problem, and validation trials are in progress in a number of watersheds. The validations consist of marking otoliths of hatchery shad with oxytetracycline (OTC), releasing the fish, and monitoring for recaptures that occur several years later. This should be a substantial help in resolving some of the aging errors, and the Review Panel encourages as many such experiments as possible to be done, particularly in systems where scales are difficult to read. **Once reliable aging can be done, it will enable the use of better modeling methods for more stocks.**

The SASC pointed out that American shad is a species well known for its life history variations with latitude (e.g., Leggett and Carscadden 1978, Limburg et al. 2003), but did not emphasize this in its report. The Review Panel felt that such information would have been useful to summarize, and to compare current parameters to historic data.

In summary, **the life history data compiled was sufficient for the assessment at hand,** and the study identifies areas of uncertainty where improvements can be made. Such improvements could lead to the development of stock-specific management plans where necessary for populations at various levels of abundance. Furthermore, improved data

will enable the development of models and plans that may require other life history parameters, such as stock-recruit parameters, more detailed estimates of mortality (natural and human-driven), growth, maturity, counter-gradient growth variation, and ecosystem interactions.

Table 1. Summary of key biological, life history, and abundance indices reported for American shad, for the river/bay systems in the 2007 stock assessment. An "x" denotes the item was found in the report; "(x)" indicates data were considered unreliable by SASC & Panel; "●" was used by SASC to denote an index that went into the assessment, "O" denotes that an index was present, but not used, & "?" unreliable scales of Delaware River fish cast doubt upon age, maximum age, & repeat spawning estimates. Z = total mortality, M = natural mortality, FD = Fishery Dependent, FI = Fishery Independent, & JAI = Juvenile Abundance Indices.

State	River	Basic Biology				Relative Abundance Indices			
		Length	Weight	Sex	Age	FD Commercial	FD Recreational	FI Adult	JAI
ME	Merrymeeting Bay							O	O
	Kennebec								●
	Androscoggin	x		x	x				●
	Saco	x		x	x			●	
NH	Exeter	x		x	x			●	
MA	Merrimack	x	x	x	x			●	
RI	Pawcatuck	x		x	x			●	●
CT, MA	Connecticut	x	x	x	x	O	O	●	●
NY	Hudson	x	x	x	x	●	●	●	●
NY, PA, NJ, DE	Delaware River & Bay	x		x	(x)			●	●
MD	Nanticoke			x	x			●	●
PA, MD	Susquehanna River & Flats	x	x	x	x	O	O	●	●
MD, DC, VA	Potomac	x		x	x	●		●	●
VA	York	x		x	x	●	O	●	●
	James	x		x	x	●	O	●	●
	Rappahannock	x		x	x	●	O	●	●
NC	Albemarle Sound	x		x	x	●	O	●	O
	Roanoke	x		x	x		O	●	
	Tar-Pamlico	x		x	x	●	O	●	
	Neuse	x		x	x	●	O	●	
	Cape Fear	x		x	x	●	O	●	
SC	Winyah Bay					●			O
	Waccamaw	x		x	x	●		O	
	Great Pee Dee					●			
	Santee	x		x	x	●	●	●	O
	Cooper	x		x		●	●	O	
	Combahee					●			
	Edisto	x		x	x	●		O	O
SC, GA	Savannah					●	O		
GA	Altamaha	x	x	x	x	●		●	O
	Ogeechee					●	●		O
FL	St. Johns	x	x	x		O	●	●	

Table 1 (continued). Summary of key biological, life history, and abundance indices reported for American shad, for the river/bay systems in the 2007 stock assessment. An "x" denotes the item was found in the report; "(x)" indicates data were considered unreliable by SASC & Panel; "●" was used by SASC to denote an index that went into the assessment, "O" denotes that an index was present, but not used, & "?" unreliable scales of Delaware River fish cast doubt upon age, maximum age, & repeat spawning estimates. Z = total mortality, M = natural mortality, FD = Fishery Dependent, FI = Fishery Independent, & JAI = Juvenile Abundance Indices.

Jurisdiction	River	Life history variables						Dams
		Max Age	Repeat Spawning	Maturity	Fecundity	Z	M	
ME	Merrymeeting Bay							
	Kennebec							x
	Androscoggin							x
	Saco					x		x
NH	Exeter	x				x		x
MA	Merrimack	x	x			x		x
RI	Pawcatuck	x	x	x		z		x
CT, MA	Connecticut	x	x	?	x	x	x	x
NY	Hudson	x	x	x	x	x	x	
NY, PA, NJ, DE	Delaware River & Bay	?	?					
MD	Nanticoke	x	x			x		x
PA, MD	Susquehanna River & Flats	x	x	x		x		x
MD, DC, VA	Potomac	x	x			x		x
VA	York	x	x			x		
	James	x	x			x		
	Rappahannock	x	x			x		
NC	Albemarle Sound	x	x			x		
	Roanoke	x	x			x		x
	Tar-Pamlico	x	x			x		
	Neuse	x	x			x		x
	Cape Fear	x	x			x		
SC	Winyah Bay							
	Waccamaw	x						
	Great Pee Dee							
	Santee	x						x
	Cooper							x
	Combahee							
	Edisto	x						
SC, GA	Savannah							x
GA	Altamaha	x				x		x
	Ogeechee							
FL	St. Johns							

B. Compile and determine adequacy of available fishery-dependent and/or independent data as indices of relative abundance for each stock.

The SASC presented clearly which indices were available, compiled those indices, described their source, and identified the life stage to which each index applies. The indices included catch-per-unit-effort (CPUE) from various fisheries, direct counts (mostly at fish passageways), fishery-independent surveys, creel surveys for recreational fisheries, and juvenile abundance indices (JAIs). In some cases, where fish could be observed passing through a discrete area, an "area-under-the-curve" approach was used to index populations. This method, which integrates fish counts over time, was used in five river systems (Hudson, James, York, Rappahannock, and Altamaha Rivers). Every river system had at least one index available (Table 1), although the number of years of data varied considerably.

Trends in indices were compared within and between systems to evaluate the consistency of the indices. **The SASC and Review Panel noted the strong need to continue to collect and evaluate indices** such as counts at fish passage facilities, JAIs, etc., to determine the degree to which these inform and support estimates of adult abundance and reflect climatic factors, modifications in passage, and so on. It was noted that linkages between life stages and between indices could be improved in the future. Most shad do not mature before 5 years of age. Due to the resulting times lags and autocorrelation issues, long-term collections need to be put in place (or continued where they exist) once techniques have been worked out and accepted.

Indices were not synthesized using a single overall approach that could be used to develop population dynamics models. Such efforts could be conducted in the future as the time series become longer.

The Review Panel was concerned that very few estimates of uncertainty were presented with the index data. **The Panel encourages the SASC to produce and present uncertainty estimates (standard errors) for all indices.**

The Review Panel was also puzzled about what the JAIs were actually indexing. Seldom was there a direct relationship between a juvenile or other young-of-year (YOY) index (e.g., post yolk-sac larvae or PYSL) and an adult index. It is unclear whether this is because of the limitations of the time series, the way the data were collected, or because of other exogenous processes (e.g., an ocean intercept fishery). Most of the presented JAIs were calculated using data collected throughout the nursery areas and included YOY of varying sizes and ages. Abundance of YOY American shad is thought to be determined by a combination of density dependent and environmental factors acting within nursery areas, as well as the process of emigration to the sea (Crecco and Savoy 1988; Limburg 1996). When the JAI includes more than one life stage, thereby integrating over these processes, it becomes unclear whether it is intended to be an index of spawner abundance during that year, or an index of year class strength that is meant to index subsequent returns as the cohort matures. Collection and analysis of size and/or age data as part of the juvenile surveys may aid in determining the utility of these data series.

C. Determine most appropriate method of estimating natural mortality.

Natural mortality (*M*) remains one of the most important but difficult life history parameters to estimate for fish stocks (Vetter 1988). Direct estimates of *M* are sometimes possible when tagging or telemetry data are available (Hearn et al. 1998; Hightower et al. 2001), but most often *M* is approximated using some aspect of species life history and environment. The SASC chose Hoenig's method (Hoenig 1983), a widely used approach to estimate *M* from the longevity of the stock. The role that *M* plays in the assessment is primarily in the calculation of biological reference points; *M* is also used in combination with catch curves to partition total mortality into fishing mortality (*F*) and *M*. The SASC's rationale for using Hoenig's method was to use a simple, widely accepted approach for a group of geographic regions where longevity information was available. Natural mortality values were determined for New England (0.38), Hudson River (0.30), York River (0.35), and Albemarle Sound (0.42) stocks (Table 1.1.5-1 in the 2007 American Stock Assessment Report). Thus, as expected by the SASC, *M* increases from north to south due to the decrease in longevity and the decrease in repeat spawning frequency (the most southerly populations are semelparous).

In the previous assessment (ASMFC 1998), *M* was assumed to vary with age, with an *M* of 0.3 for ages 1-3, and with a range of higher values of *M* for older ages, under the supposition that mature fish would have higher mortality due to spawning. The higher values for the older aged fish were also different spatially for the Hudson River, northern rivers, and southern rivers (Table 1.1.5-1, 2007 American Shad Stock Assessment Report). The approach in the current assessment differs, because the SASC chose to perform a sensitivity study to assess how changes in *M* altered assessment outputs (see TOR-D). In this sensitivity analysis, four scenarios were examined, one where *M* changed over age, from 0.51 at age-1 to 0.19 at age-14 using a method from (Boudreau and Dickie 1989), and three other scenarios where *M* was held constant across ages at different values (*M*= 0.3, 0.5, and 0.7; Table 1.1.5-4, 2007 American Shad Stock Assessment Report).

The Panel concurred with the SASC approach because the time-honored method of Hoenig is widely used, and more importantly, the SASC did a good job of examining the influence of *M* on the benchmarks that were calculated. **However, future efforts should focus on better determination of natural mortality, because biological reference points (BRPs) were very sensitive to the values of *M* used.** M is the population parameter that has the largest effect on benchmarks.

As a first step, the panel recommends that alternate life history methods should be investigated for the calculation of *M* (e.g., Alverson-Carney, Pauly, Gunderson; see Quinn and Deriso 1999, section 8.3), because these methods use additional life history information such as growth and reproduction and may help to expand or narrow the range of potential *M* values. Second, the SASC should consider whether field work could be done to determine *M* experimentally. A well-designed tagging program should be able to estimate a precise *M* value while also providing additional information of interest related to fishing mortality, age and growth, fish movement, and stock identification (see TOR-G). Third, the SASC should also consider a sensitivity scenario like that in the previous assessment, in which natural mortality increases with age.

It may also be interesting to consider a scenario in which M has a U-shaped distribution with age: high at younger and older ages and low at middle ages. This scenario would account for predation mortality at younger ages and spawning mortality at older ages.

In the current assessment, natural mortality is a parameter that encompasses various sources of mortality, including natural mortality (e.g., predation, disease), unmeasured fishing effects (e.g., bycatch, ocean fishery), and unmeasured anthropogenic effects (e.g., mortality due to dams and pollution). As the world moves to embrace ecosystem-based management, it will be necessary to separate natural and anthropogenic sources of mortality for better understanding the ecosystem. **The Panel recommends that the SASC move towards explicitly separating natural mortality M from mortality from anthropogenic sources** (Advisory Report, Section G).

D. Determine which assessment analyses are most appropriate to available data for each stock. Assessment methods will range from simple trend analysis to more complex models.

The SASC considered a variety of assessment approaches and ultimately used simple indices, catch-curve analyses, and biomass per-recruit models to assess American shad stocks. The core of the assessment is a comparison of catch-curve estimates of total mortality (Z) to benchmark Z values calculated by using a biomass-per-recruit model. Per-recruit models are widely used to estimate appropriate fishing mortality rates in conjunction with management goals. A key aspect of per-recruit models is that no knowledge of the stock-recruitment relationship is required for their calculations, because the model determines yield and biomass on a per recruit basis so harvest decisions are based on information once the fish have recruited. Data inputs for this type of model include an estimate of M, selectivity patterns, and information on weight-at-age and proportion mature-at-age. Key assumptions in per-recruit models are that fishing does not affect growth or recruitment, and that natural mortality and growth are constant with stock size (no compensation). The main output from a per-recruit model is a mortality target for the management objective, generally a level of F_{30}-F_{40} representing fishing mortality rates that would maintain biomass-per-recruit at the given percentage of the unfished stock (Quinn and Deriso 1999). Higher percentages represent more conservative fishing policies. In general, a per-recruit approach is an appropriate assessment technique for a coastwide evaluation where available data vary greatly.

The SASC's approach to per-recruit modeling differs somewhat from traditional approaches. The SASC chose to develop values of the maximum Z rather than for F. This was done because of uncertainty in the sources of mortality in American shad with hypotheses differing as to whether fishing mortality, other human-induced mortality, or changes in natural mortality are limiting American shad recovery. Benchmark values of Z_{30}, defined as the long-term total mortality rate that will preserve 30% of the biomass or egg production per recruit of an unexploited stock, were calculated for four regions to reflect differences in latitudinal differences in life history. Stock-specific estimates of Z from catch-curve methods were then compared to the Z_{30} level to assess total mortality status. Stocks where catch-curve mortality estimates exceeded Z_{30} level benchmarks were considered to have excessive total mortality.

The SASC did a good job of evaluating model sensitivity by building stock specific models where more data were available (e.g., Hudson River). As mentioned in TOR-C, the assessment showed how F benchmarks would vary across different levels of M using a range of age-variant and age-invariant M values. Benchmark F values from a per-recruit model are sensitive to M values and this sensitivity is acknowledged by the SASC in Tables 1.1.5-1 of the American Shad Stock Assessment Report. For the stock-specific benchmark calculations, different levels of M were used for each region based on known life history differences across the populations. Aging error is acknowledged as a major problem by the SASC. This source of error can have major implications in the use of the catch-curve analyses that are the core assessment for each stock. The authors do a good job pointing out the limitations related to the age validation work that has been done and studies are ongoing to aid in addressing the validation issues.

Catch-curve analysis has substantial limitations and should usually be avoided if reasonable alternatives are available (Quinn and Deriso 1999, chapter 8). Trends in recruitment cause biases in total mortality. For example, when there is a declining trend in recruitment, total mortality is underestimated. This can lead to underestimating fishing mortality, which is not precautionary. Furthermore, the trend in recruitment is completely confounded with total mortality, such that using catch-curves can not simply be validated by inspecting the slope for a linear relationship between $\log_e(N)$ and age.

The use of catch curves requires the SASC to specify the range at which full vulnerability is achieved. In the case of American shad, age frequencies in the catch curve are low and the range of ages is limited to as few as 4 cohorts. Consequently, the standard error of the catch curve is undoubtedly high, yet these standard errors are not reported nor are uncertainties in the catch-curve considered. **Future assessments should report the standard error.** The SASC also fitted catch-curves using data only to the right of the peak in the catch-age plots. The biological samples are collected in-river, and as a result the abundance of age classes that are not fully mature is underestimated (because these cohorts are not in the river where the samples are taken), which can lead to mortality estimates that are biased low. Where the data were available, the SASC did estimate Z from catch curves based on number of previous spawnings, an approach that uses abundance of mature fish only. For some populations, the estimates from the two methods were in good agreement, whereas in some other populations they were not. *Thus, catch curve analysis for American shad may be both inaccurate and imprecise.*

Given these caveats, the Panel accepts the use of catch curve analysis in this assessment, because sensitivity analyses suggest that the results presented are robust to the assumptions that were made in using the catch-curves. Nevertheless, the focus of future assessments should be the development of more modern models of age-structured populations that integrate data sources and knowledge about American shad. Age-structured models have been developed for anadromous *Alosa* that incorporate both age and previous spawning history in the catch-at-age array. Chaput et al. (2001) described a tuned VPA used for assessment of anadromous alewife in the Margaree River, Nova Scotia, and Gibson and Myers (2003) presented a statistical catch-at-age model adapted to four alewife populations in eastern Canada. Rather than tracking only abundance at age, cohorts are partitioned into sub-cohorts based on the age-at-maturity. These models preclude the need to specify maturity schedules in age-structured

models and address issues of variability in maturity schedules in the assessment models. When vital rates are held constant over sub-cohorts, estimation uncertainty can be evaluated because multiple estimates of different parameters (i.e., fishing mortality) are obtained in each year. Other alternative modeling approaches are discussed in TORs E and G.

A potential assessment framework that the ASMFC may wish to consider is one modeled after the framework used for many North Pacific salmonid stocks. For populations where data sources are limited, simple models with very conservative input parameters are used such that a highly precautionary, risk-adverse harvest policy is developed. In areas where more information is available, more in-depth models are developed which often allows greater flexibility in the management plans and potentially higher harvests in some years. Similarly, the North Pacific Fishery Management Council has a tier system for groundfish assessment based on the amount of available information. The tiers range from stocks with sufficient information to establish maximum sustainable yield (MSY), to stocks for which per recruit analyses can be conducted, to stocks for which only historical catch information is available. **These tiered systems** for being precautionary in data-poor situations, and more active in managing harvest in more data-robust environments, **could potentially be implemented for American shad along the U.S. East Coast.**

E. Estimate biological reference points for each stock where possible.

The SASC developed a benchmark total mortality rate, Z_{30}, defined as the long-term total mortality rate that would preserve 30% of the spawning biomass produced per recruit (BPR) in an unexploited population. In future assessments, the Panel recommends labeling this spawner-biomass-per-recruit (SPR) rather than biomass per recruit (BPR) to avoid confusion with *total* biomass per recruit. This reference point is analogous to the SPR fishing mortality rates (e.g., F_{30}, F_{40}) widely used as reference points in fisheries around the world when spawner-recruit relationships are uncertain (Quinn and Deriso 1999). The origin of the choice of F_{30} for American shad populations dates back to the stock assessment of 1998 (ASMFC 1998). The Panel was unable to find any rationale for the choice of the value of 30 (versus 35 or 40) and requests that future stock assessments reveal this rationale and investigate whether the choice of the value of 30 is sufficiently conservative.

The SASC chose to develop a benchmark rate for Z rather than for F because there are many competing theories about the causes of mortality in Atlantic coastal American shad stocks. This does not eliminate the issue of partitioning mortality into F and M in modeling, but it does avoid an emphasis on F when comparing the results to observed estimates of Z. A regional approach was used to estimate reference points because most individual stocks did not have all of the needed stock specific data. Z_{30} values were calculated for New England, Hudson River, York River and Albemarle Sound. The reference point could not be calculated for the most southerly populations that spawn only once and then die. For these populations, a method similar to that for Pacific salmon, also semelparous, could be explored (NMFS 2004).

Inputs to the model are natural mortality, maximum age, proportion mature-at-age, biomass-at-age, and the selectivity of fishing gear. The SASC conducted thorough sensitivity analyses of the Z_{30} values to the model inputs. Additionally, for the Hudson River population, they augmented the basic biomass-per-recruit (BPR) calculations by also determining egg production-per-recruit (EPR) after including fecundity-at-age. Egg production is more closely tied to the regenerative capacity of the population than spawning biomass, though rarely are there large differences in results. Because there is variation in the timing of the fisheries relative to natural mortality, the SASC calculated Z_{30} values for both Type 1 (fishing and natural mortality occurring at separate times) and Type 2 (fishing and natural mortality both occurring year round) fisheries. The resulting values were thought to bracket the range of expected Z_{30} values for fisheries harvesting American shad.

The Review Panel agreed that Z_{30} is an appropriate benchmark for overall use at the current time, given differences in both the biology and the types of data available for the many populations included in the assessment. However, the Review Panel identified two problems with the calculations used that were corrected at the meeting by two members of the SASC in order that the assessment could proceed. Below, our report refers to these as "revised" values of Z_{30}.

First, in the Type 1 calculation, only mature fish were vulnerable to the fishery, but the survivorship calculation included fishing mortality for both mature and immature fish. The second issue was that gear selectivity (termed a "partial recruitment vector") had also been included in the survivorship calculation. Because the Z_{30} reference point was the benchmark against which Z values calculated from catch curves were being compared, gear selectivity needed to be set equal to one for all ages, if the two values were to be comparable. This results from the implicit assumption that Z is the same for all ages when estimated from a catch curve using linear regression.

Because shad are diadromous, the effect of increasing total mortality on spawner biomass depends on how that mortality is distributed throughout the population. In-river fisheries typically harvest mature fish just prior to spawning, whereas both mature and immature fish are vulnerable to fisheries in the ocean. In-river fisheries affect populations just before spawning, whereas adult turbine mortality affects a population after reproduction has occurred. In each case, the effect of increasing mortality on spawning biomass-per-recruit may differ between these two types of fisheries, even if the increase in (annual) mortality is the same.

The Review Panel agreed with the SASC that the effects of in-river fisheries could be modeled as a Type 1 fishery, and that the effects of marine fisheries could be modeled as a Type 2 fishery. For both fisheries, Z_{30} is found by calculating spawning BPR for a range of fishing mortalities and finding the fishing mortality that reduces the BPR to 30% of its value in the absence of fishing.

The order of mortality events is an important consideration when developing BPR models. For a Type 1 in-river fishery, N_a is the number of fish at age a (mature and immature combined) at the time when the mature fish component first enters the river. These fish are assumed to be fished

after river entry, but before spawning. Given this order of events, the spawning biomass per recruit for a given level of F, BPR_F, is given by:

$$BPR_F = \sum_a N_a(1-u_a)m_a w_a ,$$

where m_a, w_a and u_a are the age-specific maturity probabilities, weights, and exploitation rates, respectively. The abundance N_1 at age 1 is set to a constant value (say 1,000) to obtain a per-recruit value. The number of fish at age a+1 is given by:

$$\begin{aligned} N_{a+1} &= N_a m_a e^{-M}(1-u_a) + N_a(1-m_a)e^{-M} . \\ &= N_a e^{-M}(1-m_a u_a) \end{aligned}$$

The first term on the right side of the first line of the equation is the number of surviving mature fish and the second term is the number of surviving immature fish. The second line is the equation reduced. In this equation, fishing mortality is only applied to mature fish, because immature fish are largely absent from the river system. If selective gear is used, age-specific gear selectivity, v_a, can be included in the model in the calculation of u_a:

$$u_a = (1-e^{-v_a F}) .$$

Note that the assumption $v_a = 1$ was used here so that the Z_{30} and catch curve Z values would be comparable. Additionally, the partial recruitment vectors from the original assessment were not used in the revised Z_{30} values, because there is uncertainty about their connection to gear selectivity. Given the variability in gears used to capture shad, and the fact that other in-river sources of mortality were being included, the Review Panel considered this assumption appropriate for the current wide-scale assessment, but recommends that gear selectivity be investigated further in stock-specific assessments where fisheries or other sources of mortality are known to be selective. Gear selectivity determines how mortality is distributed over ages. As a result, the reference Z_{30} values will change if selectivity is included and will be specific to the gear.

For a Type 2 at-sea fishery (in which natural and fishing mortality operate concurrently and both mature and immature fish are vulnerable to the gear), BPR_F, is given by:

$$BPR_F = \sum_a N_a m_a w_a$$

because the start of the year is when mature fish are found at the mouth of the river system, after at-sea fisheries and just before spawning.

In this situation, N_{a+1} is calculated as:

$$N_{a+1} = N_a e^{-M}(1-u_a) ,$$

because both mature and immature fish experience natural and fishing mortality.

The exploitation fraction u_a is approximated by the standard Baranov equation:

$$u_a = \frac{v_a F}{Z_a}\left(1 - e^{-Z_a}\right), \text{ where } Z_a = v_a F + M .$$

The Review Panel then considered how to parameterize the BRP model for a Type 2 fishery. Were young fish vulnerable to the ocean fisheries? Can the very limited stock information from tagging and genetics be used to establish reference points? How much variability is there in gear selectivity by age? Are there sex-specific differences? Is it defensible to ignore the river mortalities here? The Review Panel could not resolve any of these issues with the scientific information at hand. Therefore, the Review Panel did not ask the SASC members to provide revised values from the Type 2 fishery, because of uncertainties in the ocean fisheries related to stock, age, and sex composition.

Results from the revised per recruit procedure are contrasted with the SASC stock assessment results from 1998 and this year in Table 2. The revised benchmark calculations resulted in higher Z_{30} values than were initially estimated by the SASC. This is the expected outcome because the revised results have less total mortality on immature shad, thus allowing higher mortality on mature shad. The revised results are lower than the comparable Z_{30} values used in the last region-wide shad assessment (ASMFC 1998), because natural mortality for older ages was much higher in the previous assessment.

Biological reference points are indices based on the biological characteristics of a fish stock and the characteristics of its fisheries or other human interactions. They are used to gauge whether specific management objectives are being achieved and provide both the link between stock assessment and management objectives (Caddy and Mahon 1995), and a basis for risk analysis of management actions (Punt and Hilborn 1997). **Although the Review Panel considered the Z_{30} benchmark sufficient for the region-wide comparisons presented in this assessment, this reference point is not directly linked to the management issues for many of these populations and the Review Panel encourages the development of population-specific reference points appropriate for the alleviation of the threats that exist for many of these populations.** Where abundance is sufficient to support fisheries, fishery-type reference points are appropriate, but for populations under restoration or rebuilding, reference points must also be appropriate for assessing the effectiveness of recovery activities. Human activities impact anadromous fish populations in many ways (e.g., fishing, dams and turbine mortality, habitat degradation), and where populations that are fished are under stress from other human activities, fishery reference points may need to be adjusted to compensate for the reduced productivity resulting from these other activities. For populations with low freshwater productivity, meeting the Z_{30} criterion will not ensure population recovery, as it does not explicitly account for this reduced production. The Review Panel notes that rebuilding targets are being developed for many of these populations and that in many instances, such as the Susquehanna River population, the SASC provided these targets in its report.

Table 2. Initial and revised benchmark total mortality rates (Z_{30}) for each region for a Type 1 (T1) fishery. Initial values came from the original stock assessment produced by the SASC; revised values (in bold) were provided by SASC members as requested by the Review Panel. The Panel recommends that the revised values be used. Values used in the last assessment (ASMFC 1998), and corresponding F_{30}s for the York River are provided for comparison.

Region	Model	Max. age	M [1]	Z_{30}		F30
				EPR [2]	BPR [3]	
New England	T1	11	0.38	-	0.64	
	revised T1	11	0.38		**0.98**	
Hudson River, NY	T1	14	0.30	0.52	0.54	
	revised T1	14	0.30	**0.68**	**0.73**	
York River, VA	T1	12	0.35	0.64	0.63	0.28
	revised T1	12	0.35	**0.85**	**0.85**	**0.50**
Albemarle Sound, NC	T1	10	0.42	-	0.76	
	revised T1	10	0.42		**1.01**	
ASMFC 1998						
All rivers	1-3		0.3			
Hudson	4-10		0.6		0.99	0.39
Northern rivers (NC-ME)	4-10		1.5		1.93	0.43
Southern rivers (SC-FL)	4-8		2.5		2.98	0.48

[1] assumed instantaneous natural mortality
[2] eggs per recruit
[3] biomass per recruit

The Z_{30} benchmarks could not be developed for the most southerly populations because they are semelparous. First, the Review Panel suggests that reference points for these populations be determined using surplus production, biomass dynamics, or delay-difference models, as shown in Hilborn and Walters (1992) and Quinn and Deriso (1999). Although at present the Panel does not know whether this approach will provide plausible reference points, testing the approach would also evaluate the utility of the data in this type of model. These kinds of models can be used with age-structured populations that do not have reliable age data for catch and abundance. Second, it may be possible to develop management benchmarks from standard semelparous spawner-recruit analysis (Quinn and Deriso 1999, chapter 3). Here an index of recruitment (from juvenile surveys) would be compared with an index of spawners (from river surveys) in order to establish F_{msy} reference points. This approach is widely used with Pacific salmon populations (NMFS 2004). This may also be the solution to the problems in the Delaware River,

for which aging accuracy is suspect. The above models could possibly be derived using the Lewis haul seine (adult) time series and the JAI in an age-aggregated modeling approach.

F. Determine current status of each stock where possible.

The SASC provided information for American shad populations in a total of 64 rivers in 16 states/jurisdictions; assessment was conducted for 31 of these populations (Table 1.2 of 2007 American Shad Stock Assessment Report). Stock assessments based on trend analyses using fisheries-independent and/or fisheries-dependent index time series, were presented for 23 of these populations (Table 3). For 16 of these populations, comparisons of total mortality rates to benchmark total mortality rates (Z_{30}) were provided.

Given the wide variety of data types available for each population, coupled with differences in the biology, fisheries, and human and non-human induced factors that differentially affect shad population dynamics on a river by river basis, the SASC opted to assess Atlantic coastal shad stocks on an individual basis. **The Review Panel agreed that as an anadromous species, American shad should be assessed and managed by river system.** American shad spawn in rivers along the entire U.S. Atlantic coast and there are gradient (latitudinal) differences among river systems in life history attributes as well as river-specific factors such as the presence of dams (with and without fish passage), water quality problems, and estuarine and in-river fisheries that can lead to river-specific variation in patterns of abundance and in restoration potential.

The SASC used a simple index-based approach in its assessment for several reasons. These included the complexities of modeling oceanic and estuarine mixed-stock fisheries as well as river-specific commercial and recreational fisheries, particularly when few of the mixed-stock fisheries are adequately monitored, but there is almost no information about how to allocate the mixed-stock harvest among stocks. Additionally, few long-term, fishery-independent indices exist, except on rivers with fish passage, and the SASC identified uncertainties about the age data.

The SASC acknowledged that the assessment would not provide definitive answers to all the questions plaguing management of Atlantic coastal American shad. However, it did expect the assessment to give insight to managers on the complexity of the issues facing American shad in order to assist them in their decision-making as well as laying the foundation for future assessments in terms of data sources and methods.

The Review Panel found that, with some exceptions, the SASC was able to determine the current status of many of the stocks, an impressive result given existing data uncertainties and limited resources. From river to river, the basis for this assessment ranged from appropriate qualitative statements about status where populations were extirpated or are near extirpation to assessments of trends in abundance indices and total mortality. Where data were limiting or contradictory, the SASC appropriately stated that stock status was unknown. The Review Panel anticipates that the summaries provided by the SASC estimates will be particularly informative for prioritizing research and management actions as it relates to restoration of populations and preventing further declines.

Table 3. The 2007 assessed status (recent trend) of American shad populations compared with earlier 1998 assessment. A "?" in the status column indicates that either there was insufficient data or the various data analyses gave conflicting indications of trend.

State	River	Benchmark	Z	2007 Status	1998 Status
ME	Merrymeeting Bay			declining	
	Kennebec	0.98			
	Androscoggin	0.98			
	Saco	0.98	0.8-1.6		
NH	Exeter	0.98	0.3-2.1	Declining	
MA	Merrimack	0.98	0.4-2.4	Stable	Stable
RI	Pawcatuck	0.98	0.7-2.0	Declining	Stable
CT, MA	Connecticut	0.98	0.7-3.0	Stable	Stable
NY	Hudson	0.73	0.4-1.4	Declining	Declining
NY, PA, NJ, DE	Delaware River & Bay	0.85		Stable	Stable
MD	Nanticoke	0.85	0.1-1.6	Stable	Increasing
PA, MD	Susquehanna River & Flats	0.85	1.0-3.5	Declining	
MD, DC, VA	Potomac	0.85	0.6-1.5	Increasing	
VA	York	0.85	0.4-1.4	Increasing	Declining
	James	0.85	0.7-1.4	Declining	Stable
	Rappahannock	0.85	0.3-1.4	Stable	Stable
NC	Albemarle Sound	1.01	0.3-2.4	Stable	
	Roanoke	1.01		Stable	
	Tar-Pamlico	1.01	0.9-2.0	?	
	Neuse	1.01	0.2-2.0	?	
	Cape Fear	1.01	0.5-2.0	?	
SC	Winyah Bay	None		Stable	
	Waccamaw	None		?	
	Great Pee Dee	None		?	
	Santee	None		?	Increasing
	Cooper	None		Stable	
	Combahee	None		?	
	Edisto	None		Declining	Stable
SC, GA	Savannah	None		Stable	
GA	Altamaha (+ Ocmulgee)	None		Declining	Increasing
	Ogeechee	None			
FL	St. Johns	CPUE		Stable	

In general, as summarized by the SASC, American shad stocks have substantially declined from historic levels (see "Perspectives" section). The coastwide stock has experienced overfishing during at least three time periods over the 150 years of record. During these time periods, landings and likely fishing intensity have varied through time such as low landings during World War I, when fishing was thought to have declined, and high landings during World War II, when fishing increased. Major changes in recruitment have also historically occurred due to in-river modifications (dams, dredging, pollution, etc.). Recently, potentially large reductions in fishing

mortality have also likely occurred due to the closure of the ocean-intercept fisheries. This closure may expedite stock recovery, but the time period since closure in 2005 and this assessment in 2007 has not been long enough to detect a response from the resource. Recreational fishing appears to be highly variable across the coast, but trends in recreational fishing are generally not well known. While habitat related improvements are being made as part of ongoing river restoration programs (e.g., up-stream passage, improvements in water quality), the Peer Review Panel suggested substantial improvements to both upstream and downstream fish passage as an area requiring remediation and research. Finally, bycatch in shad and other fisheries is almost totally unknown and needs expedited investigation in future assessments.

The Review Panel appreciated the efforts of the SASC to provide historical landings data that at times dated back into the 1800s. While historical landings data cannot be used to estimate virgin biomass prior to exploitation, they do provide indications of stock potential which aid in the interpretation of the low but stable abundances reported for some rivers. There also appear to be latitudinal differences in stock status, with northern stocks having experienced larger declines and apparently slower recovery to historical overfishing than more southern stocks.

While the available data, trend analyses, and benchmark Z_{30} comparisons carried out by the SASC were sufficient to provide an overview of status of shad populations in many rivers, the Review Panel recommends the development of population-specific assessment approaches that can be used to address management questions relevant to the specific population. Guidance on this recommendation is provided in TOR-G.

G. Develop recommendations for needed monitoring data and future research.

The Panel reviewed the SASC recommendations on page 154 of its report. **The Panel thought that the SASC captured most of the important points and decided to use these recommendations as the basis for its own.** The Panel made changes to SASC recommendations 1, 2, 6, 9, 10, and 12 and added one additional recommendation about modeling.

Recommendations for Fisheries and Fishery Assessments:

1. Due to the poor condition of many shad populations, future management actions to reduce total mortality are needed.
2. Develop a management recovery plan for those populations where current total mortality is above the Z_{30} benchmark. Components of this plan could include reductions in commercial or recreational fishery mortalities, reductions in bycatch, habitat restoration, improvements in upriver and downstream fish passage, or some combination. All stocks should have management plans that describe fishery and habitat goals and objectives for both the short term and long term. These plans should be reviewed and updated on a regular basis.
3. Identify all fisheries where bycatch occurs, then quantify the amount and disposition of bycatch. In fisheries where bycatch is allowed, quantify the discards.
4. Employ observer coverage to verify the reporting rate of commercial catch and harvest, as well as bycatch and discards.

5. Identify directed harvest and bycatch losses of American shad in all fisheries. In particular, the ocean and bay waters of Atlantic Maritime Canada should be included in this investigation.

6. Future assessments will need to better separate ocean and river fishing mortality in historical data. The problem is that data from the now-closed ocean fishery are limited in regard to stock origin, age composition, and maturity of fish. There is need for better identification of stock composition in mixed stock harvest using microchemistry techniques, genetics, and/or tagging. Modeling may help to account for ocean mortality, and efforts to locate age composition and maturity information.

7. Spatially delineate between mixed stock and Delaware stock areas within the Delaware River system.

8. Collect annual estimates of recreational catch, total harvest, CPUE, age, size, and sex composition of fish in each fishery.

9. If in-river tagging programs (conducted in Georgia, South Carolina, and Maryland) used to estimate exploitation and population size are continued, then assumptions must be verified. Issues related to reporting rate, tag mortality and loss, and movement (fallback), which are needed to estimate exploitation, need to be addressed.

10. Improve analyses of mark-recapture data by using modern methods (e.g., those contained in program MARK; Williams et al. 2001) to estimate survival.

11. Monitor juvenile production in semelparous stocks. Such monitoring may indicate when recruitment failure has occurred.

12. Accurate and precise aging is a critical underpinning of shad stock assessment and a prerequisite to any substantial improvement. Validation of aging procedures using either scales or otoliths is greatly needed for most shad stocks. These methods should allow for age and year-class identification in mature fish. To validate otoliths, it would be desirable to mark stocked larvae with OTC, alizarin, or thermal marking.

13. Characterize passage-associated efficiency, mortality, migration delay, and sub-lethal effects on American shad at hydroelectric dams.

14. Annually update all summary data tables of on-going data collection for use in the next assessment in the format used in this stock assessment for use in ASMFC stock assessments only.

15. Shad population modeling must be vastly expanded in the future. First, age-structured assessment models are needed to integrate the various sources of information available for shad stocks. These models have largely supplanted catch-curve analyses around the world. Second, models that incorporate predator-prey interactions should be examined. Shad are consumed by striped bass (e.g., in Connecticut), seals, sharks, other fishes, and birds. Little is known about these effects. If statistical multi-species models cannot be developed, then perhaps Ecopath may provide some insight. Third, the ultimate goal of stock assessment of shad should be to develop a life history model that accounts for all major factors that affect the mortality, recruitment, and reproduction of shad. This model would include factors in

the ocean environment such as ocean fishing, fisheries bycatch, and oceanographic processes. This model would include factors in the freshwater environment, including fish passage and related mortality, commercial and recreational fishing mortality, habitat changes, and environmental factors. Such a model would be useful to help understand which processes are most important in the sustainability of shad populations.

Recommendations for Habitat

1. Develop safe, timely, and effective upriver and downriver passage for adults and downriver passage for juvenile at all barriers that limit access to spawning reaches.
2. Maintain water quality and suitable habitat for all life stages of American shad in all rivers with shad populations. Refer to Amendment 1 for habitat issues pertaining to American shad and the ASMFC Anadromous Species Habitat Source Document (*in prep*).
3. In rivers with flow regulation, maintain flows at levels that ensure adequate fish passage, water quality, and habitat protection.

H. Describe the locations and amounts of shad and river herring bycatch in commercial fisheries for mackerel, sea herring, and other pelagic species and estimate the contribution of that bycatch to fishing mortality.

The SASC members were unable to complete this task at the time of the review. The data sources are widely dispersed and not readily available. This task remains a high priority for the SASC, as bycatch could potentially represent a significant and unknown source of mortality.

Advisory Report

A. Stock status

The stock assessment report identifies that all the stocks are highly depressed from historical levels. Current status, i.e., whether the stocks are currently improving or not, was identified for most stocks (Table 3). Declines in American shad in recent years were indicated for Maine, New Hampshire, Rhode Island, and Georgia stocks, and for the Hudson, Susquehanna, James and Edisto Rivers. Low and stable, but often highly variable, stock abundance was indicated for Massachusetts, Connecticut, Delaware, Chesapeake, Rappahannock, some South Carolina, and Florida stocks. Stocks showing some rebounding in recent years include the Potomac and York stocks. Data limitations and conflicting data precluded the report from saying much about the current status or trend of stocks from North or South Carolina (see Table 3).

The status of stocks as reported in the 1998 stock assessment report was based on 1992-1996 trends. Many of the stocks exhibited stable or positive trends during this time and these trends seem to continue until around 1999-2000, as indicated by the current assessment. The current assessment shows declines for several of these stocks from the turn of the century (Pawcatuck, Chesapeake Bay, James, Edisto rivers). The Panel report from the last assessment (1998) stated that: "*These trends in abundance over the 1992-1996 period may reflect natural variability, changes in fishing pressure, or both. The short time series is of limited applicability in analyzing the long term health of American stocks.*" This comment is still relevant and the changes in short term trends seen for American shad just reemphasize this. Only two stocks show some signs of increasing recent trends, i.e., York and Potomac Rivers. The Potomac was not assessed in the last review and the York showed a decline in that review. **Taken in total, American shad stocks do not appear to be recovering. Current restoration actions need to be reviewed and new ones need to be identified and applied.** These include fishing rates, dam passage (and survival there from), stocking, and habitat restoration.

B. Stock Identification and Distribution

East Coast stocks of American shad have distinct phylogenetic structure due to their natal homing behavior (Bentzen et al. 1989; Nolan et al. 1991; Brown et al. 1996) and are known to mix along their migration routes. Direct evidence comes from tagging experiments (e.g., Talbot and Sykes 1958; Dadswell et al. 1987; Jesien et al. 1992) and is also inferred from natural genetic composition (Brown et al. 1996, 2000) and from biogeochemical signatures in otoliths (Thorrold et al. 1998; Walther 2007).

In the current stock assessment, the SASC discussed at length the impacts of the ocean-intercept fishery on American shad (Section 1.5.1, Part A). Using a combination of artificial tagging and genetic data, the SASC attempted to parse out the percentages of mixed stock ocean (including Delaware Bay) harvests that individual stocks composed. Heaviest mixed stock exploitation was estimated to derive from North and South Carolina, and from the Delaware, Hudson, and Connecticut Rivers. For the Hudson River, where more data are available, the losses attributed to the ocean-intercept fishery appear to be reasonable.

As pointed out in Brown et al. (2000), shad marine migration paths are likely to vary from one year to the next due to changes in climate and possibly other ecological factors. Hence, mixed stock ocean fisheries are likely to intercept different stocks at different rates across time. The uncertainty that arises lends support to the precautionary measure of closing down the ocean-intercept fishery.

The SASC pointed out that further methods development is needed to resolve the mixing of American shad stocks. The Review Panel concurs, and recommends both the implementation of archiving programs (for DNA and otoliths) and more research on otolith chemical markers.

C. Management Unit

Management units of individual river stocks appear appropriate and are supported by the genetic evidence (Brown et al. 2000; Waters et al. 2000). Additional assessment approaches may require combining information from multiple stocks to create regional models supported by life history differences in the stocks, such as a southern stocks (South Carolina, Georgia, and Florida) Mid-Atlantic, and North Atlantic stocks.

D. Landings

The SASC has done an excellent job compiling landings statistics from a variety of state and federal sources across about a 150-year time period (and in the case of the Potomac River, back to 1814). These landings statistics provide useful information to infer stock potential for restoration purposes.

E. Data and Assessment

This is addressed in TOR-D.

F. Biological Reference Points

This is addressed in TOR-E.

G. Fishing Mortality

Most of the mortality estimates presented were in terms of Z calculated from catch-curve methods. Partitioning of mortality into estimates of F requires additional assumptions related to M. Because of uncertainty in M, estimates of F were not presented. There is also some debate on the SASC about what is included as F or M. Generally in most fisheries stock assessments, F would include all anthropogenic sources or mortality. For example in these stocks, this would include mortality associated with fishing (directed commercial, commercial bycatch, and recreational) and adult dam passage mortality. Natural mortality sources would include fish that die due to any non-anthropogenic source including predation, old age, or spawning associated mortality.

The SASC and individual managers expressed interest in developing approaches to partitioning mortality into different sources. We have provided some guidance related to this in TOR-G. Most management actions are directed at regulating F. The SASC's approach of presenting

mortality in terms of total mortality assumes that M has remained constant across the time series where Z values were presented for each stock in order to evaluate trends in F. Using this approach, the SASC is monitoring trends in Z for responses to recent fishery management actions such as closure of the ocean-intercept fishery. If the assumptions of the catch-curve methods are met, then this approach is likely reasonable. However, by not partitioning mortality, the SASC needs to address other hypotheses of interest such as changes in natural mortality related to ecosystem changes (e.g., increases in striped bass abundance) which may lead to increased predation on American shad. The exception is for the York River where benchmark guidelines are presented for F_{30} levels as well as Z_{30} levels.

The SASC's recommendation to continue the use of Brownie type survival models (Brownie et al. 1985) is a good recommendation to estimating total mortality from tagging data. Estimates of reporting rate are required to partition mortality into component parts. Lack of knowledge about reporting rates is possibly why survival estimates from the Brownie models in the Hudson River are not partitioned into component parts. The SASC's decision to exclude other tagging based exploitation estimates (e.g., South Carolina) because of uncertainty in reporting rate and mixing of marked and unmarked fish is appropriate. However, properly designed tagging programs conducted over multiple years could provide annual estimates of fishing mortality for use in assessing stock status and evaluating factors limiting recovery. Jiang et al. (2007) provide an example of using a tagging program to estimate F and M for striped bass in the Chesapeake Bay.

H. Recruitment

The Panel feels that the SASC did an excellent job compiling the existing recruitment indices. Juvenile recruitment data are often lacking in many fisheries assessments and efforts to monitor recruitment should continue for each stock. The Panel feels that additional effort should be made to determine how JAIs compare to estimates of adult abundance, both in terms of run size that produced a particular year class and how well strong year classes detected in the JAI programs persist in the adult stock. This would aid in evaluating recruitment responses to climatic events, such as droughts and flooding, or changes in dam management operations related to enhancing upstream and downstream passage capabilities at dams.

I. Spawning Stock Biomass

No estimates of spawning stock biomass (SSB) were presented. However, historical landings data do provide some insight into the potential spawning stock biomass, indicating that SSB is likely much lower currently than in previous time periods (Figure 1). Recent indices of adult abundance also demonstrate large reductions in stock biomass for the northern stocks (Maine through Rhode Island). The Connecticut stock shows variable but stable indices of adult returns, the Hudson River stock shows decline, and the more southern stocks show mixed signals or a stable trend with high variability. However, all abundance indications show low spawning abundance compared with historical levels, assuming that the high historical landings correlate with high historical spawning levels.

J. Bycatch

This is addressed in TOR-H above.

K. Other Comments

Throughout the SASC report there is little discussion on the amount of uncertainty associated with data used in the assessment, particularly in the indices such as annual variance in JAIs. The Panel would like to again make the same recommendation as in the 1998 American shad stock assessment to present uncertainty in model inputs whenever possible instead of assuming that values are known. This allows managers not only to evaluate the uncertainty in the input data, but also to evaluate the uncertainty associated with model results and to aid in research planning by identifying areas where sampling variability is high or model outputs are highly sensitive to uncertain data inputs. These recommendations follow guidelines highlighted in the 1998 NRC report, *Improving Fish Stock Assessments*, which encourages all stock assessments to "*present realistic measure of the uncertainty in model outputs whenever feasible*" (NRC 1998).

L. Perspectives

The world is a rapidly changing place, as the impact of humanity becomes ever more pervasive. Historical ecology has become one means to study and evaluate this impact (e.g., Jackson et al. 2001; Briggs et al. 2005). The current American shad stock assessment explicitly incorporated historical perspectives, by compiling catch data as far back in time as the early 1800s. Throughout the stock assessment report, time series of harvests from a number of states and river systems are presented along with the corresponding state or system summary. The Panel brings these data together in a slightly different way by (a) putting all the time series data onto the same temporal scale, with different scales on the y-axis, in order to examine temporal trends, and (b) putting all the data on the same scales on both axes, in order to examine the magnitude of these trends. The Panel normalized the catch data to the distances of available river kilometers that shad would have traversed during different time periods, following Limburg et al. (2003). This allows us to compare catches among river systems. The Panel notes that the un-normalized trends show similar patterns.

In addition, the Panel can comment on some of the past characteristics of American shad as listed in newspaper accounts from the New York Times Archive, and make note of other past information. The New York Times had many articles about the shad fishery. Archives are available online dating back to 1851 (www.nytimes.com).

Historical Time Series of Catches

Long-term data were available from the American shad stock assessment report for the states of Maine, Massachusetts, Rhode Island, Connecticut, New York (Hudson River), Maryland (mostly upper Chesapeake), the Potomac River, North Carolina, South Carolina, and the Savannah River, which borders South Carolina and Georgia. These data were normalized by dividing the catches by the amount of available river and estuary kilometers that shad would have traveled to reach their spawning grounds (Figure 1-A). Mostly the river/estuary distances declined over time,

unless a dam passageway was built or a dam was removed. The periods of the two World Wars are included in Figure 1-A to help guide the eye.

Fisheries peaked at different times over the past 120 years, with highest harvests in the 1880s and 1890s in the Hudson River, Maryland, and North Carolina, but peaking later in Maine (1912), Massachusetts (1957), and Connecticut (1946). Considerably lower catches per km were recorded for Rhode Island, South Carolina, and the Savannah River. Catches increased in both Connecticut and New York during the Depression and remained high throughout the post-WWII period, but declined (or possibly collapsed) shortly thereafter.

The Potomac River has data going back to 1814; the maximum harvest from extant records was in 1832, with a total catch of 51,136,364 kg (167,112 kg per river km). If the average shad caught then weighed five pounds (2.27 kg), this amounted to over 10 million fish; if the average shad weighed four pounds (1.82 kg), this would have been over 12 million fish caught in one system in one year. Indeed, it was thought that 22.5 million fish could be caught "in a good year" (Tilp, 1978, cited in the ASMFC report). Later the Potomac fishery peaked in 1898, but as in some other systems, went through a serious of gradual "fishing up" and collapse episodes. Today, that fishery is limited to bycatch and recreational landings, and a stocking program is in place to supplement the remnant population.

If all the time series are placed on one graph with arithmetic axes (Figure 1-B), the scale of the early Potomac fishery to subsequent ones is startling. Log-transforming the landings axis (Y-axis) permits all the time series to be viewed. On this scale, the long-term decline is exponential with a slope of -0.035 yr^{-1} with all the data ($R^2 = 0.33$, $p < 10^{-5}$), or -0.033 yr^{-1} if the early Potomac landings are excluded ($R^2 = 0.26$, $p < 10^{-5}$).

American Shad in the 19th Century

There is a large gap in data from 1832 until the 1880s, but the Panel does know from historical and contemporary accounts that the shad fisheries were already in decline by the mid-19th century. Fishing regulations had already gone into effect in the 18th century in New England, and net lift periods were put in place in the Hudson River in the 1870s.

During this period, the field of scientific aquaculture grew into a major tool that federal and state resource commissions used to enhance flagging fisheries. Seth Green began experimenting with shad culture in 1867 in the Connecticut River, and by 1870 shad eggs were being hatched both in the Connecticut and Hudson Rivers (NYT 1874). Green and his colleagues transported shad to the West Coast by rail (Boyle 1969) and attempted to establish populations in the Great Lakes and Mississippi River (NYT 1874). The American Fish Culturists' Association, which evolved into the American Fisheries Society (AFS), was founded in 1870 and had an initial focus on shad, salmon, and trout. The first scientific report in the Transactions journal was on American shad culture (Clift 1872). By the turn of the century, major aquaculture facilities were in place along several rivers.

Difficult as it is to believe today, American shad were dramatically important as a food source through the 19th century and into the early 20th century. "*Its* [shad] *abundance in the early history of the country was such as to excite the unbounded astonishment of those who beheld it for the first time*" (NYT 1874). Charles Minor Blackford wrote in 1916 that, "*...there is probably no fish on earth that surpasses the shad in all the qualities that go to make up an ideal food fish...*" (Blackford 1916). There are many 19th century newspaper accounts of the toothsome flavor and appeal of shad. It is no mystery why so much effort was put into its propagation.

Why did American shad catches decline so precipitously in the early 20th century? Although it may never be known definitively, there is ample evidence that raw sewage and other noxious pollution became severe and persistent in the period of the 1890s through the 1920s. For example, in November, 1916 the New York Times ran the note:

"*Shad are reported in the Hudson River. They are not many, and they are not edible, tasting of sludge and oil too much. It is not known certainly what is the explanation of their unseasonable appearance, but it serves to recall the time when the shad fisheries of the Hudson were worth as many hundreds of thousands as in recent years they have been worth thousands*" (NYT 1916).

Nineteenth century accounts document repeatedly that American shad were larger and weighed more in the early and mid-century than later. A 1611 account from the Potomac River was of shad measuring a yard long (91 cm) (Tilp 1978, cited in the ASMFC stock assessment). In 1903, the New York Times reported that: "*A few years ago, eleven, twelve, and even fourteen pound shad were not uncommon in the Hudson, but very little is heard of shad of that sort today. The average weight for both sexes, according to the figures of the United States Fish Commission, is between three and four pounds*" (NYT 1903).

Finally, linkages with marine ecosystems were also apparent and in decline in the late 19th and early 20th centuries. Future ecosystem models that include shad could use some of the historic accounts as a starting point. For example, shad were known to be preyed upon by marine species. "*In the deep sea the horse mackerel, kingfish, and shark work dreadful havoc with the adults. Even the porpoise pursues the shad to shore and devours him just as he reaches the haven of river water*" (NYT 1903). Stevenson (1899) was acutely aware of the linkages between continental watersheds and coastal marine fisheries, and wrote in his monograph on the state of shad fisheries that:

"*The relationship between the different species of fish in the economy of nature is not very well understood, but sufficient is known to indicate that the valuable shore fisheries on the New England coast are intimately associated with the run of shad and similar species up the rivers of that section. Seventy years ago the run of fish up the rivers of the New England States was very much greater than at present, and after the parent fish had disappeared the waters swarmed with the young, which later in the year descended to the sea in enormous schools, attracting the cod, haddock, and other offshore species, which were caught in great abundance within a short distance of the coast, rendering unnecessary the expensive and hazardous trips to distant banks. But with the depletion of shad, alewives, salmon, and kindred species came a corresponding diminution in the number of cod, haddock, etc. near the coast. And it appears that any measures tending to restore the anadromous fishes to their former abundance will also improve the coast fisheries.* (pp. 104-105)"

Shifting Baselines and Lost Connectivity

American shad has lost its place as a dominant species in East Coast estuaries and rivers, and has dropped out of commonplace memory in America. Historical reconstructions may help to establish a baseline and benchmarks against which to measure recovery. The late 19th century harvests have been suggested as a baseline, but there is evidence that even these fisheries were conducted on depleted populations. In the 21st century, American shad could become a bellwether of ecosystem health, managed not only for fisheries, but also to indicate the status of the connectivity and environmental quality of watersheds and coastal oceans.

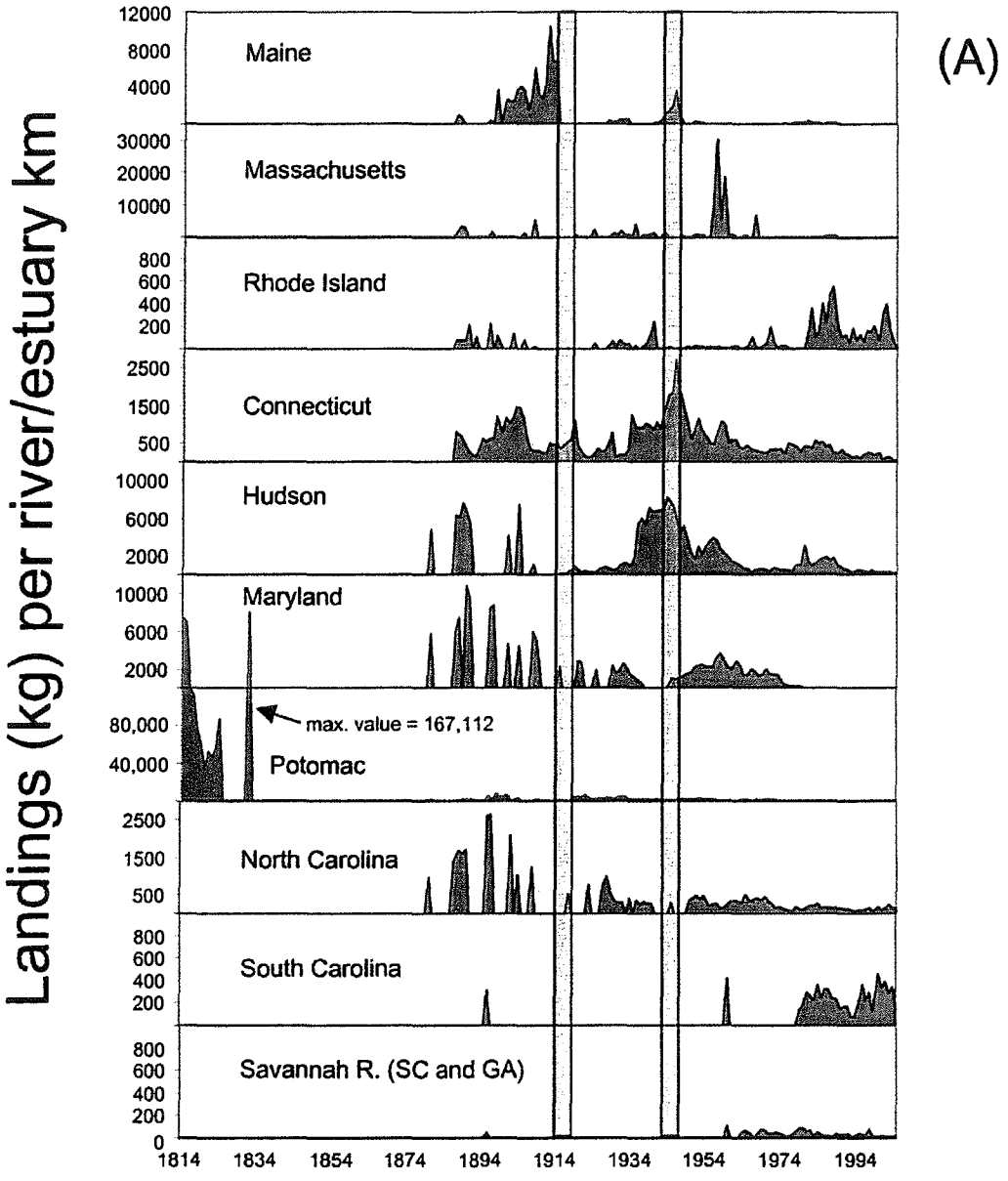
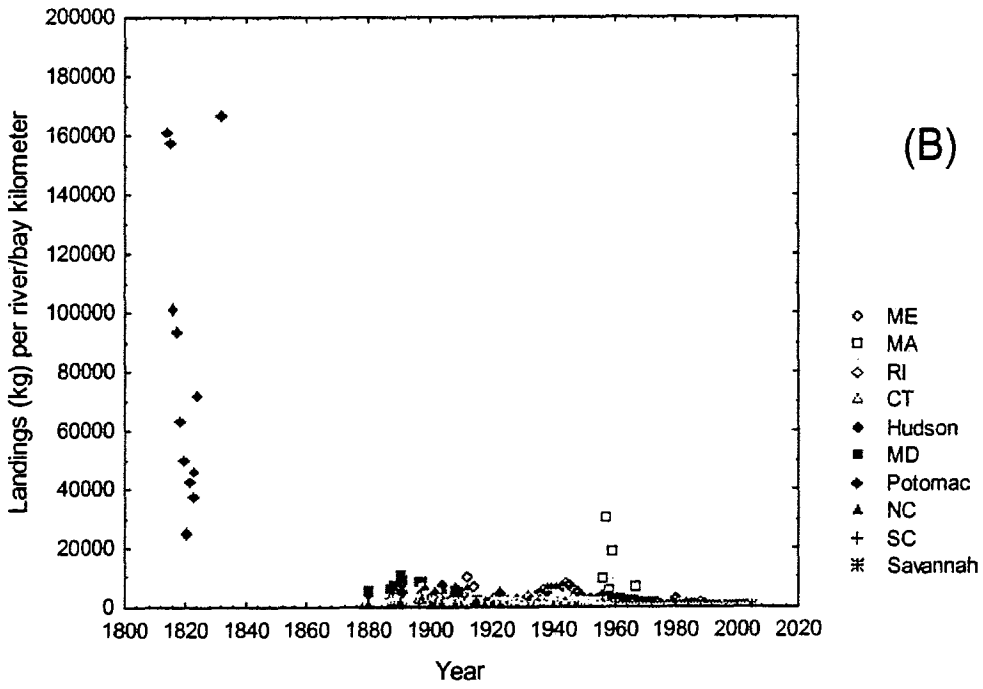
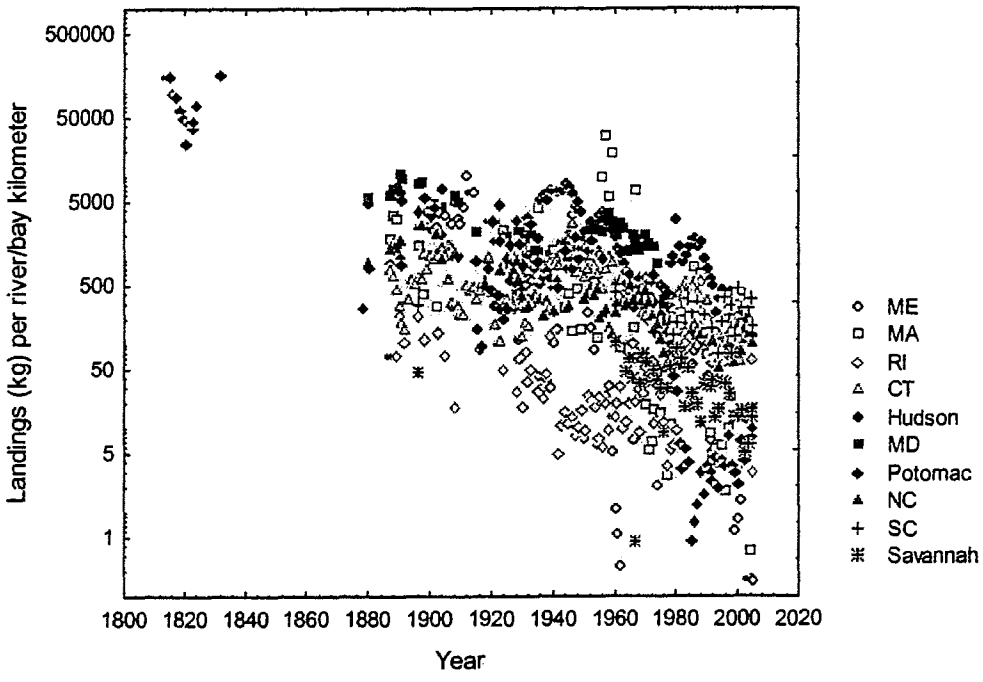


Figure 1. Time trends of American shad landings for selected rivers. Landings have been normalized by dividing by the distance inland that shad could migrate through estuaries and rivers from the sea. (A) Trends shown by individual state or river system; note the differences in y-axis scales. The two World Wars are shown as light gray bars. (B) Trends placed on the same y-axis: arithmetic scale (top) and logarithmic scale (bottom).


(B)
Landings (kg) per river/bay kilometer
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
1800 1820 1840 1860 1880 1900 1920 1940 1960 1980 2000 2020
Year
ME
MA
RI
CT
Hudson
MD
Potomac
NC
SC
Savannah


Landings (kg) per river/bay kilometer
500000
50000
5000
500
50
5
1
1800 1820 1840 1860 1880 1900 1920 1940 1960 1980 2000 2020
Year
ME
MA
RI
CT
Hudson
MD
Potomac
NC
SC
Savannah

M. Sources of information (Literature Cited)

ASMFC. 1985. Fishery management plan for the anadromous alosid stocks of eastern United States: American shad, hickory shad, alewife and blueback herring. Atlantic States Marine Fisheries Commission, Washington, D.C.

ASMFC. 1988. Stock Assessment of American Shad from selected Atlantic coast rivers. October 1988. Atlantic States Marine Fisheries Commission special report 15. Washington D.C.

ASMFC. 1998. American shad stock assessment peer review report. Atlantic States Marine Fisheries Commission, Washington, D.C.

Bentzen, P., G. G. Brown, and W. C. Leggett. 1989. Mitochondrial DNA polymorphism, population structure, and life history variation in American shad, *Alosa sapidissima.* Canadian Journal of Fisheries and Aquatic Sciences 46:1446–1454.

Blackford, C. M. 1916. The shad – a national problem. Transactions of the American Fisheries Society 45:5-14.

Boyle, R. H. 1969. The Hudson River: A Natural and Unnatural History. W.W. Norton & Co.

Boudreau, P. R., and L. M. Dickie. 1989. Biological model of fisheries production based on physiological and ecological scalings of body size. Canadian Journal of Fisheries and Aquatic Sciences 46: 614-623.

Briggs, J. M., K. A. Spielmann, H. Schaafsma, K. W. Kintigh, M. Kruse, K. Morehouse, and K. Schollmeyer. 2005. Why ecology needs archaeologists and archaeology needs ecologists. Frontiers in Ecology and the Environment 4(4): 180-188.

Brown, B. L., J. M. Epifanio, P. E. Smouse, and C. J. Kobak. 1996. Temporal stability of mtDNA haplotype frequencies in American shad stocks: to pool or not to pool across years? Canadian Journal of Fisheries and Aquatic Sciences 53:2274–2283.

Brown, B. L., P. E. Smouse, J. M. Epifanio, and C. J. Kobak. 2000. Mitochondrial DNA mixed-stock analysis of American shad: coastal harvests are dynamic and variable. Transactions of the American Fisheries Society 128: 997-994.

Brownie, C., D. R. Anderson, K. P. Burnham, and D.S. Robson. 1985. Statistical inference from band recovery data : a handbook. United States Department of the Interior, Resource Publication No. 156. Washington, D.C.

Crecco, V., and T. Savoy. 1988. Effects of climatic and density-dependent factors on intra-annual mortality of larval American shad. Pages 69-81 *In* R. D. Hoyt, editor. 10th annual larval fish conference. Proceedings of a conference held in Miami, Florida, USA, May 18-23, 1996. American Fisheries Society, Bethesda, Maryland.

Caddy, J. F., and R. Mahon. 1995. Reference points for fisheries management. FAO Fisheries Technical Paper 347. Rome, Italy.

Chaput, G., P. LeBlanc and R. Crawford. 2001. Assessment of the Margaree River gaspereau fishery, 1997 to 2000. DFO Canadian Science Advisory Secretariat Research Document 2001/046. Department of Fisheries and Oceans, Ottawa, Ontario.

Clift, W. 1872. Shad culture. Transactions of the American Fish Culturists' Association 1: 21-28.

Dadswell, M. J., G. D. Melvin, P. J. Williams, and D. E. Themelis. 1987. Influence of origin, life history, and chance on the Atlantic coast migration of American shad. Pages 313–330 in M. J. Dadswell, R. J. Klauda, C. M. Moffitt, R. L. Saunders, R. A. Rulifson, and J. E. Cooper, editors. Common strategies of anadromous and catadromous fishes. American Fisheries Society, Symposium 1, Bethesda, Maryland.

Gibson, A. J. F., and R. A. Myers. 2003. Biological reference points for anadromous alewife (*Alosa pseudoharengus*) fisheries in Atlantic Canada. Canadian Technical Report of Fisheries and Aquatic Sciences No. 2468.

Hearn W. S., K. H. Pollock, and E. Brooks. 1998. Pre- and post-season tagging models: estimation of reporting rate and fishing and natural mortality rates. Canadian Journal of Fisheries and Aquatic Sciences 55:199–205.

Hightower, J. E., J. R. Jackson, and K. H. Pollock. 2001. Use of telemetry methods to estimate natural and fishing mortality of striped bass in Lake Gaston, North Carolina. Transactions of the American Fisheries Society 130: 557-567.

Hilborn, R., and C. J. Walters. 1992. Quantitative Fisheries Stock Assessment: Choice, Dynamics, and Uncertainty. Chapman & Hall, International Thomson Publishing.

Hoenig, J. M. 1983. Empirical use of longevity data to estimate mortality-rates. Fishery Bulletin 81: 898-903.

Jackson, J. B. C., M. X. Kirby, W. H. Berger, K.A. Bjorndal, L.W. Botsford, B.J. Bourque, R.H. Bradbury, R. Cooke, J. Erlandson, J. A. Estes, T.P. Hughes, S. Kidwell, C.B. Lange, H.S. Lenihan, J. M. Pandolfi, C.H. Peterson, R.S. Steneck, M.J. Tegner, and R. R. Warner. 2001. Historical overfishing and the recent collapse of coastal ecosystems. Science 293: 629-637.

Jesien, R. V., S. K. Gaichas, J. E. Serafy, and C. H. Hocutt. 1992. Stock composition of coastal Maryland and Virginia American shad fisheries: 1992 tagging study. Final Report to Maryland Department of Natural Resources, Annapolis.

Jiang, H., K. H. Pollock, C. Brownie, J. M. Hoenig, R. J. Latour, and J.E. Hightower. 2007. Tag return models allowing for harvest and catch and release: evidence of environmental and management impacts on striped bass fishing and natural mortality rates. North American Journal of Fisheries Management 27: 387-396.

Leggett, W. C., and J. E. Carscadden. 1978. Latitudinal variation in reproductive characteristics of American shad (*Alosa sapidissima*) - evidence for population specific life history strategies in fish. Journal of the Fisheries Research Board of Canada 35: 1469-1478.

Limburg, K. E. 1996. Growth and migration of 0-year American shad (*Alosa sapidissima*) in the Hudson River estuary: Otolith microstructural analysis. Canadian Journal of Fisheries and Aquatic Sciences 53: 220-238.

Limburg, K. E., K. A. Hattala, and A. W. Kahnle. 2003. American shad in its native range, pp. 125-140 In K. E. Limburg and J. R. Waldman, editors. Biodiversity, Status, and Conservation of Shads Worldwide. American Fisheries Society Symposium 35.

McBride, R. S., M. L. Hendricks, and J. E. Olney. 2005. Testing the validity of Cating's (1953) method for age determination of American shad using scales. Fisheries 30(10): 10-18.

Nolan, K., J. Grossfield, and I. Wirgin. 1991. Discrimination among Atlantic coast populations of American shad (*Alosa sapidissima*) using mitochondrial DNA. Canadian Journal of Fisheries and Aquatic Sciences 48:1724–1734.

NMFS. 2004. NOAA Fisheries' Approach to Making Determinations Pursuant to the Endangered Species Act about the Effects of Harvest Actions on Listed Pacific Salmon and Steelhead. NOAA, NMFS, Nortwest Regional Office, Sustainable Fisheries Division, Seattle, WA.

NRC. 1998. Improving Fish Stock Assessments. Committee on Fish Stock Assessment Methods, Ocean Studies Board. National Research Council. National Academy Press, Washington, D.C.

NYT. 1874. "Fish and Fisheries – Report of the United States Commissioner – General History of Fish Culture – Fishes Especially Worthy of Cultivation – Efforts Made for the Propagation of Shad." New York Times, December 1, 1874.

NYT. 1903. "More Shad for the Hudson." New York Times, April 12, 1903.

NYT. 1916. "Hudson River fisheries." New York Times, November 1916.

Pauly, D. 1995. Anecdotes and the shifting baseline syndrome of fisheries. Trends in Ecology and Evolution 10: 430.

Punt, A., and Hilborn, R. 1997. Fisheries stock assessment and decision analysis: the Bayesian approach. Reviews in Fish Biology and Fisheries 7: 35-63.

Quinn, T. J. II, and R. B. Deriso. 1999. Quantitative Fish Dynamics. Oxford University Press, New York.

Stevenson, C. H. 1899. The shad fisheries of the Atlantic coast of the United States. Pages 101-269 in U.S. Commission of Fish and Fisheries, Part XXIV. Report of the Commissioner for the year ending June 30, 1898. Government Printing Office, Washington, D.C.

Talbot, G.B., and J. E. Sykes. 1958. Atlantic coast migrations of American shad. Fishery Bulletin, U.S. 58: 472-490.

Thorrold, S.R., C.M. Jones, S.E. Campana, J.W. McLaren, and J.W.H. Lam. 1998. Trace element signatures in otoliths record natal river of juvenile American shad (*Alosa sapidissima*). Limnology and Oceanography 43: 1826-1835.

Tilp, F. 1978. This Was Potomac River. Tilp, Alexandria, Virginia. 358 pp.

Vetter, E.F. 1988. Estimation of natural mortality in fish stocks: a review. Fishery Bulletin 86: 25-43.

Walther, B. 2007. Migratory Patterns of American Shad (Alosa sapidissima) Revealed by Natural Geochemical Tags in Otoliths. Ph.D. dissertation, Woods Hole Oceanographic Institution (joint WHOI/MIT graduate program).

Waters, J. M., J. M. Epifanio, T. Gunter, and B. L. Brown. 2000. Homing behaviour facilitates subtle genetic differentiation among river populations of *Alosa sapidissima*: microsatellites and mtDNA. Journal of Fish Biology 56: 622-636.

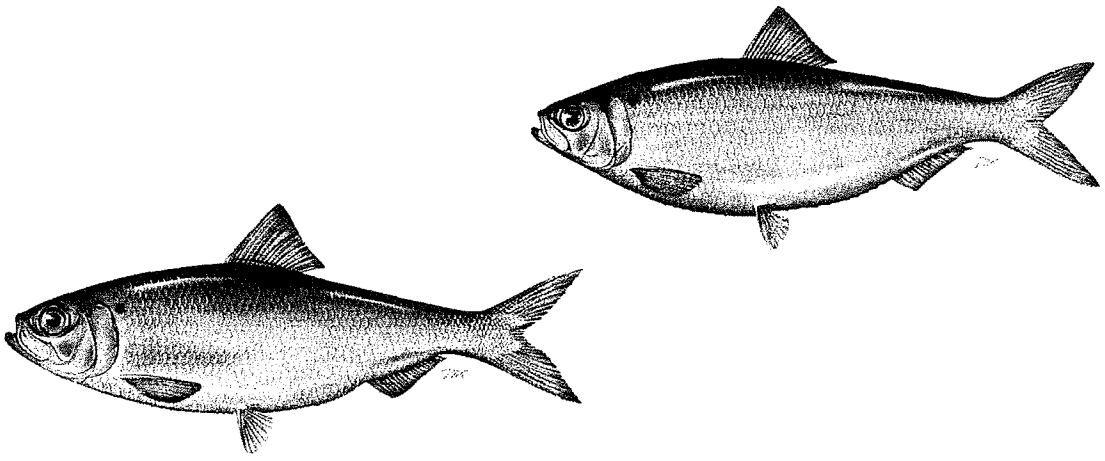
Williams, B.K., J.D.Nichols, and M.J. Conroy. 2002. Analysis and Management of Animal Populations. Academic Press.

DRAFT FOR MANAGEMENT BOARD REVIEW

Stock Assessment Report No. 12-02
of the

Atlantic States Marine Fisheries Commission

Terms of Reference & Advisory Report
of the River Herring Stock Assessment Peer Review



March 2012

Working towards healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015

DRAFT FOR MANAGEMENT BOARD REVIEW

Stock Assessment Report No. 12-02
of the

Atlantic States Marine Fisheries Commission

Terms of Reference & Advisory Report
of the River Herring Stock Assessment Peer Review

Conducted on
March 14-15, 2012
Raleigh, North Carolina

Prepared by the
ASMFC River Herring Stock Assessment Peer Review Panel

Dr. Karin Limburg, Panel Chair, State University of New York
Dr. Ken Oliveira, University of Massachusetts-Dartmouth
Dr. John Wiedenmann, Rutgers University
Dr. Bob O'Boyle, Beta Scientific Consulting

A publication of the Atlantic States Marine Fisheries Commission pursuant to National Oceanic and Atmospheric Administration Award No. NA10NMF4740016

DRAFT FOR MANAGEMENT BOARD REVIEW

Table of Contents

TABLE OF CONTENTS 3

PREFACE 5

ACKNOWLEDGEMENTS 7

INTRODUCTION 8

TERMS OF REFERENCE FOR THE RIVER HERRING STOCK ASSESSMENT PEER REVIEW 9

1. EVALUATE THE JUSTIFICATION FOR INCLUSION OR ELIMINATION OF AVAILABLE DATA SOURCES 9
2. EVALUATE THE ESTIMATES OF OCEAN BYCATCH OF RIVER HERRING AND THE METHODS USED TO DEVELOP ESTIMATES. 14
3. EVALUATE THE METHODS AND MODELS USED TO ESTIMATE POPULATION PARAMETERS (E.G., Z, BIOMASS, RELATIVE ABUNDANCE) AND BIOLOGICAL REFERENCE POINTS, INCLUDING BUT NOT LIMITED TO: 16
4. EVALUATE THE METHODS USED TO CHARACTERIZE UNCERTAINTY IN ESTIMATED PARAMETERS. ENSURE THAT THE IMPLICATIONS OF UNCERTAINTY IN TECHNICAL CONCLUSIONS ARE CLEARLY STATED. 19
5. EVALUATE RECOMMENDED ESTIMATES OF STOCK BIOMASS, ABUNDANCE (RELATIVE OR ABSOLUTE), MORTALITY, AND THE CHOICE OF REFERENCE POINTS FROM THE ASSESSMENT FOR USE IN MANAGEMENT; IF APPROPRIATE, RECOMMEND CHANGES OR SPECIFY ALTERNATIVE ESTIMATION METHODS. 21
6. EVALUATE STOCK STATUS DETERMINATION FROM THE ASSESSMENT; IF APPROPRIATE, RECOMMEND CHANGES OR SPECIFY ALTERNATIVE METHODS/MEASURES. 23
7. REVIEW THE RESEARCH, DATA COLLECTION, AND ASSESSMENT METHODOLOGY RECOMMENDATIONS AND MAKE ADDITIONAL RECOMMENDATIONS AS WARRANTED. CLEARLY PRIORITIZE THE ACTIVITIES NEEDED TO INFORM AND MAINTAIN THE CURRENT ASSESSMENT, AND PROVIDE RECOMMENDATIONS TO IMPROVE THE RELIABILITY OF FUTURE ASSESSMENTS. 24
8. RECOMMEND TIMING OF THE NEXT BENCHMARK ASSESSMENT AND UPDATES, IF NECESSARY, RELATIVE TO THE LIFE HISTORY AND CURRENT MANAGEMENT OF THE SPECIES. 28

ADVISORY REPORT 29

A. STATUS OF STOCKS: CURRENT AND PROJECTED, WHERE APPLICABLE 29
B. STOCK IDENTIFICATION AND DISTRIBUTION 29
C. MANAGEMENT UNIT 29
D. LANDINGS 30
E. DATA AND ASSESSMENT 31
F. BIOLOGICAL REFERENCE POINTS 33
G. FISHING MORTALITY 33
H. RECRUITMENT 34
I. SPAWNING STOCK BIOMASS 34

J. BYCATCH 34
K. OTHER COMMENTS 34
L. SOURCES OF INFORMATION (LITERATURE CITED) 35

Preface

Summary of the ASMFC Peer Review Process

The Stock Assessment Peer Review Process, adopted in October 1998 and revised in 2002 and 2005 by the Atlantic States Marine Fisheries Commission (ASMFC or Commission), was developed to standardize the process of stock assessment reviews and validate the Commission's stock assessments. The purpose of the peer review process is to: (1) ensure that stock assessments for all species managed by the Commission periodically undergo a formal peer review; (2) improve the quality of Commission stock assessments; (3) improve the credibility of the scientific basis for management; and (4) improve public understanding of fisheries stock assessments. The Commission stock assessment review process includes an evaluation of input data, model development, model assumptions, scientific advice, and a review of broad scientific issues, where appropriate.

The Benchmark Stock Assessments: Data and Assessment Workshop and Peer Review Process report outlines options for conducting an external peer review of Commission managed species. These options are:

1. The Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) conducted by the National Marine Fisheries Service (NMFS), Northeast Fisheries Science Center (NEFSC).
2. The Southeast Data and Assessment Review (SEDAR) conducted by the National Marine Fisheries Service, Southeast Fisheries Science Center (SEFSC).
3. The Transboundary Resources Assessment Committee (TRAC) reviews stock assessments for the shared resources across the USA-Canada boundary and is conducted jointly through the National Marine Fisheries Service and the Canada Department of Fisheries and Oceans (DFO).
4. A Commission stock assessment Peer Review Panel conducted by 3-5 stock assessment biologists (state, federal, university). The Commission Review Panel will include scientists from outside the range of the species to improve objectivity.
5. A formal review using the structure of existing organizations (i.e. American Fisheries Society, International Council for Exploration of the Sea, or the National Academy of Sciences).

Twice annually, the Commission's Interstate Fisheries Management Program (ISFMP) Policy Board prioritizes all Commission managed species based on species management board advice and other prioritization criteria. The species with highest priority are assigned to a review process to be conducted in a timely manner.

In March 2012, the Commission convened a Stock Assessment Peer Review Panel comprised of scientists with expertise in stock assessment methods and/or diadromous species and their life history. The review of the river herring stock assessment was conducted at the Doubletree Brownstone Hotel in Raleigh, North Carolina from March 14 - 15, 2012. Prior to the Review Panel meeting, the Commission provided the Review

Panel Members with an electronic copy of the 2012 River Herring Stock Assessment Report.

The review process consisted of an introductory presentation of the completed 2012 stock assessment by river system and from a coast wide perspective. Each presentation was followed by general questions from the Panel. The second day involved a closed-door meeting of the Review Panel during which the documents and presentations were reviewed and a report prepared.

The report of the Review Panel is structured to closely follow the terms of reference provided to the stock assessment team.

Acknowledgements

The Peer Review Panel thanks the members of the River Herring Stock Assessment Subcommittee and Shad and River Herring Technical Committee, as well as staff of the Atlantic States Marine Fisheries Commission, particularly Patrick Campfield, for support during the review process.



Alewives

Introduction

'River herring' is the collective term for two of the anadromous alosine herrings: the alewife, *Alosa pseudoharengus*, and the blueback herring, *A. aestivalis*. These are closely related species, sharing many physical characteristics and broadly overlapping in range (Collette and Klein-Macphee 2002).

'River herring' is also a misleading misnomer, for the anadromous shads spend most of their lives at sea. However, they concentrate in spawning aggregations in rivers, and it is there that traditional fisheries are prosecuted. Furthermore, young fry use riverine, lacustrine, and estuarine habitats as nursery grounds. Thus, these species are recognized for connecting inland watersheds to marine ecosystems, transporting production from one realm to the other and back again at different life stages.

River herring are not as well documented in historical fisheries as were their larger congener the American shad; however, new analyses based on historical accounts suggests that their abundances far exceeded that of American shad (Hall et al. *in press*). Prior to exploitation by Western European colonists, populations of river herring in large river systems likely ran in the hundreds of millions; coastally this would have translated into annual spawning runs in the billions. Seaward emigrating young-of-year also encountered a gauntlet of marine predators (Stevenson 1899); hence these young fish presented a clear trophic link between inland and marine production.

Today, these linkages are largely broken. Stocks of river herring are greatly depleted compared to the early 17th century baseline, as well as compared to that of the late 19th century. As well, many genotypes are probably extirpated (Chapman 1895), most of them without documentation.

Reviewing the recent history of this species pair from 1950 when harvests began to be reported consistently, river herring are depleted. This most recent decline appears to have begun in a period of large, offshore harvests by a combination of foreign and U.S. fleets (River Herring Stock Assessment Report).

This report reviews components of the recent stock assessment of river herring conducted by the Stock Assessment Subcommittee (SASC). Data collection, standardization of indices, trend analyses, and stock assessment models were undertaken by the SASC, and uncertainties quantified. The Panel commends the SASC on the comprehensive approach and points out some places for improvement in the following sections. The Peer Review Panel concurs with the SASC conclusions, that river herring stocks are depleted, that ocean bycatch is an issue, and that recovery will require management on multiple fronts (e.g., fishery management, watershed management) and will need to be responsive to factors beyond human control (e.g., climate change).

Terms of Reference for the River Herring Stock Assessment Peer Review

1. Evaluate the justification for inclusion or elimination of available data sources.

The River Herring Stock Assessment Subcommittee (SASC) cast a wide net to collect and synthesize data from as broad a variety of sources as possible. The approach was inclusive rather than exclusive, and uncertainties and caveats were noted.

For inland/coastal information, 57 systems (mostly rivers) were included in the coast-wide assessment (Table 1). Nine categories of fisheries independent and dependent information were considered by the SASC. Most of the valid information was for northern systems; much information was lacking, particularly in southern states. It was noted that few state surveys actually target river herring per se. Some of the better count data were at fish passage facilities. For select data sets, a change in sampling methodology was a concern, as it limited utility of a data set for temporal trend analysis. Overall, however, there were sufficient data to undertake many of the analyses presented by the SASC.

Historical and modern catch data were obtained state by state and for the entire U.S. coast. NOAA Fisheries maintains data from 1950 onward, while pre-1950 data were from a combination of federal and state sources. Although the first reported catches dated from 1887, both the SASC and the Peer Review Panel noted that large data gaps occur prior to 1950 due to incomplete reporting by state. As an example, the U.S. Fisheries Commission reported river herring harvests in 1892 as coming solely from Massachusetts (3,651,000 lbs or 1,659.5 MT). On the other hand, the New York Times, which reported a great deal on fisheries in the 19th century, listed additional 1892 harvests of river herring from New York, Delaware, Maryland, and North Carolina totaling 19,932 MT – thus, the total harvest for that year was well over 20,000 MT or a factor of 12 larger than reported in U.S. statistics (NYT 1895). The Panel recognizes the difficulties in estimating catch from historical sources, but encourages the SASC to pursue these avenues in the future.

A problem with catch data is that these are generally reported only as 'river herring' or even as 'alewife'. Parsing out the species can be done by making reasonable assumptions about range distributions (cf. Limburg and Waldman 2009). However this was not done for the assessment.

Recreational catch data were not used because the only data source, NOAA's Marine Recreational Information Program, does not collect data in fresh water where most recreational fishing for river herring occurs. Additionally, there was concern about species misidentification in this dataset.

Trend analyses were conducted on most datasets, including catch-per-unit-effort data (loess smoothed, 11 rivers), run size estimates (23 rivers), young-of-year indices (13 rivers as well as lower Chesapeake Bay and Albemarle Sound), miscellaneous young-of-year, juvenile, and adult surveys (4 rivers), 19 trawl surveys, as well as the biological (mean length, maximum age) and population level (total mortality, Z, computed by age or by repeat spawning marks) information. The Panel noted that while the catch rate series were standardized for effort, analyses of these data would have benefited from use of Generalized Linear Modeling approaches which would have allowed more in-depth

exploration of the trends in the data as well as their uncertainties. Further comments on the uncertainties in the trend analyses are evaluated in ToRs 3 and 4.

Indices of run sizes based upon visual or electronic counters were available for six states for differing time periods preceding the 2010 surveys. Cluster analyses of three time intervals were conducted (1984-2010, 1999-2010, and 2003-2010) to explore temporal and spatial trends in run size. The first time period allowed for the longest time series to be analyzed but was restricted to 10 rivers (3 Maine, 4 New Hampshire, and 1 each in Massachusetts, Rhode Island, and Connecticut). A reduction in the time period (1999-2010) allowed more recent trends to be examined, increasing the analysis to 15 rivers (3 Maine, 6 New Hampshire, 3 Massachusetts, 2 Rhode Island and 1 Connecticut). The final time series (2003-2010) allowed the inclusion of 19 rivers (4 Maine, 6 New Hampshire, 3 Massachusetts, 3 Rhode Island and 3 Connecticut).

Although the run sizes in most rivers examined exhibited a decline, no geographic relationships could be detected by the cluster analysis. The data from 2003-2010 did show some promise as a geographic predictor of a latitudinal relationship and additional (future) analysis will be needed to bear this out. A problem with analysis of run counts is that the data are subject to both natural (i.e. spring rainfall) and anthropogenic modifications (i.e. river diversion or fishway modification) in upstream accessibility that can be acute or long term. Other confounding factors include the location of any obstruction or fishery component downstream of the census location and the absence of data on whether or not river herring use specific spawning locations within a river.

Length data were available from eight states (Maine, New Hampshire, Massachusetts, New York, Maryland, North Carolina, South Carolina, and Florida) along with the National Marine Fisheries Service Bottom Trawl survey. Sex-specific trends in length over time were examined for Maine through South Carolina; however large gaps in the Florida time series (1973-2001) prevented its inclusion. Although sampling methods were inconsistent between rivers, all trend analyses were based on within system sampling so gear selectivity should not have been a concern.

The trend analysis of the length data found a negative relationship in 4 of 10 rivers for alewife and 5 of 8 for blueback herring. The SASC noted significant trends were more common in times series that began in 1990 or earlier, and hence the length of the time series may be a confounding factor. The potential for a geographic bias may also be present for the two species because the number of rivers sampled was not even between regions. Of the six rivers where significant trends were found, only two were from New England while 8 of the 12 rivers examined were from this region. Evidence for this concern may also be seen in the results of the NEFSC Bottom Trawl survey where coast-wide trends were seen in alewife and "to a lesser extent in the blueback." It should be noted that Marcy (1969; cited as an ageing reference by SASC) notes a latitudinal trend in size that was apparent in the late 1960's. The panel realizes the SASC does not have the power to control data collection but encourages all attempts to obtain data from the under or non-represented states (regions).

River herring age data, determined by scales, were used for maximum age, length-at-age analyses, age at maturity, and associated mortality estimates. Potential problems with growth differences precluded use of length keys to develop age estimates.

All states cited the methods of Cating's (1953) study of ageing shad scales as part of the methodology for ageing their river herring. Several problems with the use of Cating's method have been discussed in recent years (McBride et al. 2005 and Duffy et al. 2011). Most recently Duffy et al. (2011) found that Cating's method does not reliably account for shad ages over large latitudinal ranges. Some of the discrepancy lies in the use of transverse grooves to establish the freshwater zone and ages one to three. They concluded transverse groove formation is more closely related to scale size (fish size) rather than a function of age. This would create a latitudinal interpretation problem that becomes more acute as the trends in decreasing length noted above develop.

The SASC clearly noted the weaknesses of using ages determined by scales:

> "These protocols have not been validated with known-age fish, and there have not been many efforts to standardize river herring ageing across states. As with any ageing method, there is the potential for bias both between labs and within labs over time as personnel change and methods are not consistently standardized."

Additionally, the Panel recognized that in the absence of validation (using known age fish) or alternate aging structures (i.e., otoliths) there were no alternatives. The Panel felt strongly that there is a need to develop a standardized, validated ageing process to reliably provide vital life history data.

Overall, the Panel concluded the SASC adequately justified the inclusion and exclusion of the available data in its analysis.

State	River	Time series	By species	Harvest	Age
ME	Damariscotta	1943-2010			
	St. George	1943-2010			
	Union	1975-2010			
	Orland	1943-2010			
	Androscoggin	1983-2010			
	Sebasticook	2000-2010			
	Merrymeeting Bay/Tribs	1979-2009			
	Gulf of Maine	2000-2010			
NH	Exeter/Squamscott	1991-2010			
	Lamprey	1991-2010			
	Winnicut	1991-2010			
	Oyster	1991-2010			
	Cocheco	1991-2010			
	Taylor	1991-2010			
	Great Bay Estuary	1997-2010	x		
MA	Mattapoisett	1988-2010			o
	Monument	1980-2010			o
	Nemasket	1996-2010			o
	Parker	1971-1978, 2000-2010			o
	Town	2000-2010			
	Agawam	2006-2010			o
	Back	2007-2010			
	Charles	2008-2009			
	Mystic	2004-2010			
	Quashnet	2004			
	Stony Brook	1978-2004			o
RI	Gilbert Stuart	1981-2010			
	Nonquit	1999-2010			
	Buckeye Brook	2003-2010			
	Pawcatuck	1988-2010			x
	Ocean waters	1979-2010			
	Naragansett Bay	1988-2010			
	Coastal ponds	1992-2010			
CT	Bride Brook	1966-1967, 2003-2011			
	Connecticut River	1975-2011			
	Farmington River	1976-2011			
	Thames River	1996-2011			
NY	Hudson	1975-2010		o	o
DE, NJ, PA	Delaware River	1980-2010	o	o	o
	Delaware Bay	1966-2010	o	o	o
MD	Nanticoke	1959-2010	o		o
	Susquehanna	1972-2010	o		
	Chesapeake Bay	1959-2010			o
MD, VA, DC	Potomac River	1959-2010			
VA	James	1966-2010	o		o
	Rappahannock	1966-2010	o		o
	York	1966-2010	o		o
NC	Albemarle Sound	1972-2009		o	
	Chowan River	1972-2009			
SC	Wynah Bay				
	Santee-Cooper	1969-2010	o		o
	Savannah River				
	Ashley-Combahee-Edisto Basin				
GA	Altamaha River	2010			
	Ogeechee River	2010			
	Savannah River	2010			
FL	St. John's River	2001 -2010			

Length	Weight	Repeat Spawner	FI Adult	FI JAI	FD CPUE
●					
●					
●				●	
●			●		
●		o	●		
●		o	●		
●		o	●		
●		o	●		
●		o	●		
●		o	●		
x				x	
o	o		●		
o		o	●		
o	o				
o			●		
			●		
o					
●			●		
●	●	●	●		
●	●	●			
●	●	●			
o	o	o	o		
●	●	●	●	o	
●	●	●	●	o	
			●		
x	x	x	o	●	
●			●	●	
●			●	●	
●			●	●	
o			●		
o			●	o	
			●		
			●		
o	o	o	o	o	o
o			o	o	o
o			o	o	o
o		o		o	o
			x		
					o
o			o	o	o
o	o	o	o	o	o
o	o	o	o	o	o
o	o	o	o	o	o
		o	o	●	
●	●	o			●
				x	
o	o	o	o	x	●
				x	
				x	
				x	
				x	
				x	
●			●	o	

Table 1. Summary of available data and data quality by state, river, or other system (from SASC). Dark grey cells with filled circles indicate data sets available for the entire time series of interest; medium grey cells with open circles had partial data sets available; and light grey cells with "x" indicate data sets not reliable enough to use for the assessment. Blank cells indicate no data.

2. Evaluate the estimates of ocean bycatch of river herring and the methods used to develop estimates.

For many years, incidental bycatch in marine fisheries was a known but unquantified mortality source for river herring and shad, and was identified as a high priority in the most recent American shad stock assessment review (ASMFC 2007). For the current river herring assessment, incidental catch - defined as alosines brought aboard and either retained (landed) or discarded at sea - was quantified for the first time. The purpose was to compare the magnitudes of incidental catch from all sources to reported commercial catches.

Data were obtained from the Northeast Fishery Observer Program (NEFOP) and were quantified by fleet for 14 different gear types (see pg. 19 of the stock assessment report), by year, season, geographic area, gear group, and mesh size for each species. Bycatch was estimated by taking the ratio of bycatch weight to caught weight as reported on ships by a NEFOP observer, and then adjusting these by the weight of the sold catch as reported by dealers, which is considered a more accurate weight.

Bycatch was assessed from 1989–2010. However, methodologies changed in 2005 for subsampling bycatch in high-volume midwater trawls and became better estimations. Hence, midwater trawl incidental catches are only included for 2005–2010. Coefficients of variation (CVs) were calculated following Wigley et al. (2007).

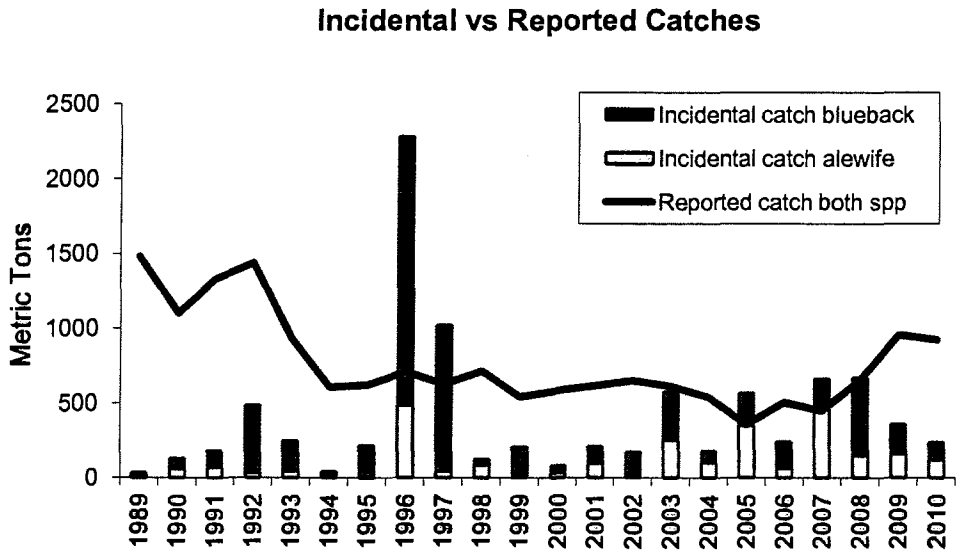


Figure. 1. Incidental catches of blueback herring and alewife, all gears and fleets reported by NEFOP observers, compared to total reported catches, 1989-2010. CVs not shown. Midwater trawl bycatch only included from 2005 onward.

Alewife bycatch ranged from a low of 2.72 MT in 2002 to 482 MT in 1996, with CVs ranging from 0.2–3.86 (20%–386%). Blueback herring bycatch ranged from 19.6 MT in 1989 to a high also in 1996 of 1803.4 MT, with CVs ranging from 0.2 to 2.1. Incidental marine catch estimates came close to or exceeded total reported commercial catches in 6

out of 22 years (Figure 1). Incidental catches occurred in all seasons, but tended to be highest during October – March. Midwater trawl catches were about equally proportioned between New England and Mid-Atlantic statistical areas, although New England small-mesh trawls took more incidental catch than Mid-Atlantic ones. Overall, New England incidental catches formed the larger part of the total (56%).

An unknown fraction of incidental catch is reported as 'landed catch' and thus the actual incidental bycatch reported as alewife and blueback herring is likely a bit lower than shown in Figure 1. However, an additional category of bycatch, called 'Herring – Unknown' (2.1 – 328 MT during this period) likely also includes river herring.

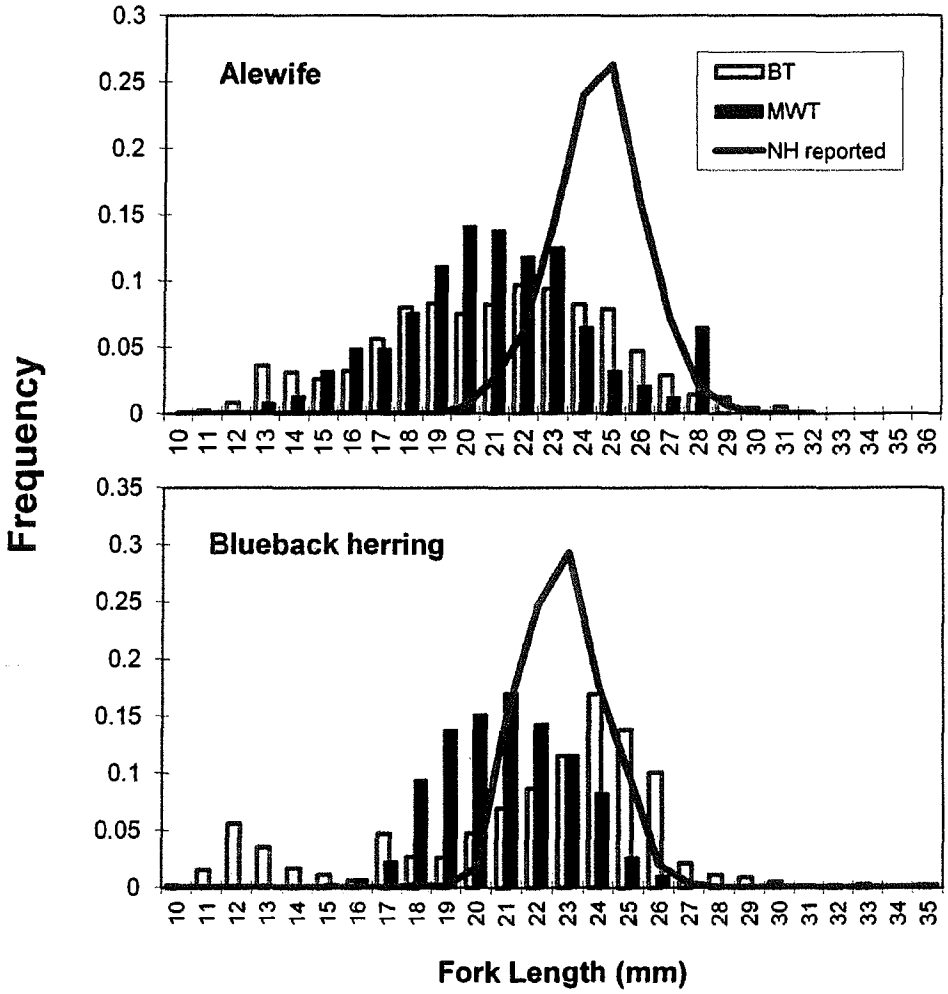


Figure 2. Length frequency distributions of alewife and blueback herring captured in bottom trawls (BT), midwater trawls (MWT), and compared to the spawner length frequency in New Hampshire. Data are from 2005-2010 added together.

Observers also record the sizes of incidentally caught river herring. It is noteworthy, even if expected, that a far broader range of sizes of both species were caught at sea than is the case in inland fisheries (Figure 2, using New Hampshire inland catches as a typical example of spawner size frequencies). For both species, large proportions of immature individuals were captured at sea. This is cause for concern.

Overall, the Panel considered the approach used by the SASC to assess incidental catches of river herring as reasonable and followed established protocols. Uncertainties were acknowledged. The Peer Review Panel encourages the assessment team to work to reduce uncertainties going forward, noting that CVs were lower in later years of the data presented. This likely is due to improvements in midwater trawl subsampling, among other things.

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, relative abundance) and biological reference points, including but not limited to:

a. **Evaluate the choice and justification of the preferred model(s) or method(s) of calculation. Was the most appropriate model or method chosen given available data and life history of the species?**
b. **If multiple models were considered, evaluate the analysts' explanation of any differences in results.**
c. **If appropriate, evaluate model parameterization and specification (e.g. choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of M, stock-recruitment relationship, choice of time-varying parameters, plus group treatment).**
d. **Evaluate the diagnostic analyses performed, including but not limited to:**
    1. **Sensitivity analyses to determine stability of estimates and potential consequences of major model assumptions**
    2. **Retrospective analysis**

Besides examining trends in fishery-dependent and -independent indices of abundance, the SASC pursued three main categories of analyses to estimate population parameters. The first consisted of the estimation of river-specific total mortality (Z). Associated with this was derivation of Z reference points based upon a Spawner per Recruit (SPR) analysis. The second category consisted of the estimation of both river-specific and coast-wide exploitation rates (u). The third category consisted of two sets of population models, one set for specific rivers (Monument, Chowan and Nanticoke) and a second set for the coast-wide stock.

Total Mortality (Z)

Age frequency information was available for many of the coast's rivers from a variety of fishery-dependent and -independent sources (see ToR 1). The Chapman-Robson (1960) survival estimator, which is comparable to catch curve analysis but less biased, was applied to the annual age frequency data to provide a total mortality estimate by river,

species, sex and year. Assumptions were made that sampling was representative of the abundance of each age class, the first age of full recruitment was the age class with the highest frequency, and selectivity for all full recruited ages was one. Z estimates were made from data with three or more age classes, including the first fully recruited age. Trends in the derived estimates were indicated through linear or loess smoothers. The method depends on the accuracy of the ages which was raised as an issue during the assessment. It is also influenced by many of the same issues that affect catch curve analysis, such as potential violation of selectivity assumption as well as variability due to recruitment events. If these are not severe, the method can provide an adequate estimate of annual total mortality along with estimates of uncertainty (CV) for each component of the coastal river herring complex.

A similar analysis of total mortality trends was conducted using the repeat spawner data available for each stock component. Estimates were made from data where three or more repeat spawner classes, including the first fully-recruited class, were deemed valid. This analysis was undertaken to avoid the problem of ageing inaccuracies. The other issues encountered in the age-specific analysis would apply here as well. The Panel was concerned that while this analysis would address the ageing issue, others may be present. Specifically, skip spawning, while not considered likely by the SASC, would produce biased (high) estimates of Z. Interestingly, the repeat spawner Z estimates tended to be higher than the age-based ones, consistent with this potential problem. And, if spawning checks and scale rings were annual, both estimates should be highly correlated, which was not the case. On balance, the Panel preferred the age-based Z estimates notwithstanding the potential ageing uncertainties.

Total mortality reference points were developed to compare to the annual Z estimates using Spawning Stock Biomass per Recruit (SRP) software available in the NMFS assessment toolbox. State-specific estimates of spawner weight-at-age were developed, in some cases converting length-at-age to weight-at-age using state-based length-weight relationships. Fishing and natural mortality were assumed to occur consistently throughout the year, so the fraction of both that elapsed before spawning was estimated by each state based on the month with the highest run count (if available) by species. Fishing selectivity was assumed to be 1 for all ages and represented both in-river adult fishing and juvenile ocean catches. It also includes other sources of mortality such as that due to passage and predation. The SPR model provides estimates of spawning biomass per recruit for a range of fishing mortalities as a percent of the maximum possible ($F = 0$). The Panel considered the methodology appropriate for use with river herring.

Exploitation rates

Exploitation rates (u) were estimated for five New England rivers by dividing the in-river harvest by the total run size (escapement plus harvest) for a given year. This method relies on the quality of escapement and harvest data. If these are reasonably accurate, the method is appropriate. Its utility is limited by the data available, a point highlighted by the fact that estimates were calculated for only five of the over 50 rivers along the coast.

Relative exploitation rates were estimated for the coast-wide river herring population by dividing the annual estimate of total catch by an index of total biomass. A coast-wide

rather than regional or river-based estimate was calculated due to the inability to partition incidental catch to region or river. The total catch was calculated from the total reported landings, NAFO landings reported from other countries, plus incidental catch (see ToR 2). An index of total annual river herring biomass was based on the minimum swept area biomass of the 1976-2010 spring NEFSC bottom trawl survey. The spring survey was used as river herring are more readily caught during the spring than during the fall. This method has been used in other data-poor situations and is part of the AIM package in the NMFS assessment toolbox. It can produce adequate trends in relative exploitation as long as its assumptions are not severely violated. Here, the catch comes from both freshwater and marine environments while the biomass index is only from the latter at one time of the year (spring). The age/size composition of the catch and survey index may be very different. There is evidence that the size composition of the freshwater landings and marine incidental catch are different (ToR 2) but no evidence on survey size composition was provided. The Panel considered that while the results were interesting, they require further verification of the approach's assumptions before being used.

Population Models

A Statistical Catch at Age (SCAA) model was developed for each of the Monument (MA), Nanticoke (MD), and Chowan (NC) rivers. The choice of these rivers was based upon a combination of data availability and modeling expertise. While not necessarily planned, it is fortunate these three rivers were chosen as they span the geographic range of river herring along the coast. The Monument model was for alewife, the Chowan model was for blueback herring, while the Nanticoke model was for both species. The three models differed significantly in a number of details but overall were innovative implementations. The Monument model used escapement for catch and did not depend upon offshore incidental bycatch, which was incorporated into the model as a component of natural mortality (*M*). Two time blocks were used to capture significant changes in the fishery and population. The model fits to the data were good with no obvious issues. It was the most advanced SCAA implementation of the three models.

The Chowan model had the same general structure as the Monument's, but did not produce as good a fit to the observations. During the review meeting, the SASC indicated this model, while still good, required further development. The SCAA models (each species) for the Nanticoke River were the least developed of the three. Not only was it acknowledged that incidental catch needed to be incorporated before its acceptance, but the fits to the observations exhibited strong residual patterns.

Overall, while none of these models are appropriate to inform management decisions at the coast-wide scale, the Panel considered the SCAA models as innovative and strongly urged further developments. In addition, they provide platforms for the study of alewife and blueback herring population dynamics at both the river and coast-wide scale. For instance, these models could be used to examine river herring-habitat relationships in each river and how these might influence reference points. Comparison of the findings of these models may provide insight on how river-based processes vary along the coast. Further, the model outputs, e.g. biomass and reference points, can be compared to evaluate whether or not each river population is mixing in the one or many discrete

offshore 'pools'. The Panel encourages efforts to expand these models to other rivers as data and resources permit.

A depletion-based stock reduction analysis (DB-SRA) was developed for the coast-wide river herring population. It employed the Pella-Tomlinson production function rather than the hybrid function developed by Dick and MacCall (2011). The model inputs included catch (including incidental bycatch), the model shape parameter (n), exploitation at MSY (U_{MSY}), the carrying capacity (K) and the ratio of 2010 to virgin biomass (B_{2010}/K ratio). Due to the long history of this fishery, initial biomass was set at 75% of K. Multiple draws were made by the SASC using different distributions of the n, U_{MSY} and K parameters to determine a value of K which provides an expected B_{2010}/K ratio. The SASC informed the Panel that the latter ratio was based on an analysis of catch and run count data which gave a general indication it was on the order of 10%. The base model assumed n=2, $U_{MSY} = 0.1$, $B_0/K = 0.75$ and $B_{2010}/K = 0.1$. Sensitivity runs (ToR 4) were conducted to explore the model's behavior to changes in the data inputs. Also, changes were made to the catch history to examine the impact of historical misreporting. The model outputs indicated K was robust to data inputs, except catch, being in the order of 634 kt – 707 kt. U_{MSY} was also relatively stable across input options, varying from 0.055 – 0.073 while B_{MSY} varied from 312Kt – 355kt.

In a Pacific Fishery Management Council–sponsored workshop to explore assessment methods for data-poor stocks (Dorn, 2011), the DB-SRA was determined to provide reasonable estimates of key population parameters, including stock status, given a range of uncertain data inputs and assumptions. However, as acknowledged by the SASC, the river herring model is strongly constrained by the input assumption on B_{2010}/K. Thus, in this case, current status is largely influenced by what is assumed to be current status. The Panel also noted that U_{MSY} of 0.06 appears to be unrealistically low and may be due to a mis-specified production function. This is complicated by the fact that the dynamics of two species (alewife and blueback herring) are being jointly modeled.

In summary, the Panel concurred with the SASC that the DB-SRA model did not adequately model river herring stock conditions and should not be used to assess status. On the other hand, it is a valuable heuristic tool to explore the possible dynamics of the resource and guide future modeling efforts which more explicitly incorporate observational informational as part of an optimization process.

4. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure the implications of uncertainty in technical conclusions are clearly stated.

For important parameters and trends estimated, the characterization of uncertainty by the SASC varied across approaches. Uncertainty arises throughout the assessment process in the estimation of various quantities, including: catch (both landed and discarded), indices of abundance, trends in the indices, mortality rates, biological reference points, and population biomass.

In general, the uncertainty in the indices of abundance was not well characterized. Estimates of CPUE from the various fisheries-dependent and -independent surveys were calculated as the total catch divided by the measure of effort. The Panel felt using a more

statistical approach was warranted to account for uncertainty in these indices in relation to covariates (e.g. estimating CPUE using a GLM).

The ARIMA model used to estimate temporal trends attempts to reduce observation uncertainty in a time series by assuming point estimates are part of an autoregressive process. The resulting fit has a variance below the variance of the fitted time series, and is an accepted way to characterize trends in noisy data over time (Helser and Hayes, 1999). In addition to the fitting of the ARIMA model, the stock assessment team accounted for additional uncertainty in the fit by computing the probability of being below the reference point (the 25th percentile of the fitted series), along with the statistical level of confidence (at the 80% level). The probability and associated confidence limits were calculated using a bootstrap approach. The Panel felt that calculating statistical levels of confidence around the estimated probability was a useful approach. However, there was some concern over the sensitivity of the ARIMA model fits to the first year in the series, and that additional smoothing techniques might be employed in conjunction with the ARIMA model to fits where conclusions in trends are sensitive to the early time period.

Estimating total mortality rates (Z) relied on the ability to age river herring using scales. The SASC acknowledged there is a large amount of uncertainty in the ageing process using scales, although it is not possible to quantify this uncertainty at present. Total mortality was also estimated using repeat spawner marks, which the SASC believed might be a less biased approach to estimated Z. Estimates of uncertainty in Z estimates were not presented in assessment. The Panel agreed that estimates of uncertainty for these values should be provided, particularly in Table 2 of the assessment that summarizes Z in relation to reference points by system.

In the stock assessment approaches (the SCAA for 3 rivers, and the coast-wide assessment using DB-SRA; see ToR 3), uncertainty was characterized in different ways. DB-SRA utilizes a Monte Carlo approach, whereby model inputs are drawn from a specified distribution. It is recognized that when using DB-SRA, specification of these input parameters is often ad hoc by necessity. The SASC specified various distributions for the input parameters, all of which were dome-shaped. In addition to the usual distributional inputs, the SASC also added uncertainty into the catch series, assuming catches early in the time series had higher coefficients of variation. Although estimates of uncertainty in the catch were added in an ad hoc manner, the Panel thought it was a significant inclusion to the model, as catches are often assumed known when using this approach. The Panel felt that uncertainty in the inputs and outputs of the DB-SRA model were generally well characterized, although in the future it might be more appropriate to assume uniform distributions for the input parameters, and then allow the model to reject unrealistic values. In addition, the Panel felt the distribution for B_{MSY} / K was likely too high, being centered at 0.5 and ranging between 0.3 and 0.7. The Panel felt the distribution should have an upper bound closer to 0.5, and be centered around 0.35. Doing so might account for some of the issues in estimates of F_{MSY} (see ToR 3).

As noted in ToR 3, SCAA models were developed for 3 river systems for one or both species of river herring: the Monument River in Massachusetts (alewife only), the Nanticoke River in Maryland (both alewife and blueback herring), and the Chowan River in North Carolina (blueback only). It was acknowledged by the SASC that the models

for the Monument and Chowan Rivers were more developed, and the model for the Nanticoke was a work in progress. All assessment models were developed in AD Model Builder (Fournier, 2011). Uncertainty in the inputs in the Monument and Chowan models was accounted for in the likelihood weighting, whereby catch and survey indices of abundance were weighted by their CV. In addition, an iterative reweighting procedure was conducted to account for the potential impacts of the individual likelihood components to the overall model fitting procedure McAllister and Ianelli (1997). Uncertainty in model estimates were reported for all quantities based on the AD Model builder-estimated standard errors in model parameters and derived quantities. The Panel recognized the characterization of uncertainty in the assessments was sound, although the standard errors in the estimates is likely biased low due to various model assumptions (e.g. fixed M, Beverton-Holt recruitment relationship).

In summary, the Panel felt the characterization of uncertainty was variable across approaches. Uncertainty was generally well addressed in the population models (DB-SRA, SCAA models) and in the trend analyses. However, uncertainty was not well accounted for in the calculation of CPUE indices. The Panel recommends using a more statistical framework, such as a GLM, when calculating CPUEs from surveys.

5. Evaluate recommended estimates of stock biomass, abundance (relative or absolute), mortality, and the choice of reference points from the assessment for use in management; if appropriate, recommend changes or specify alternative estimation methods.

No estimates of biomass, abundance (relative or absolute), or fishing mortality were recommended by the SASC. All population models considered were in some stage of development. The SCAA models were developed to describe alewife and blueback herring dynamics at the river scale. While they may have utility to inform specific management decisions at this scale, at least two of them require further development. And, their reference points are applicable to the river and not coastal scale. The DB-SRA model of coast-wide river herring dynamics was not considered to provide credible estimates of biomass and fishing mortality. The Panel felt that while the trend in historical biomass estimated by this model is likely close to the truth - relatively high prior to the 1960s after which it declined rapidly - there is considerable uncertainty in more recent trends, with some formulations suggesting a small increase and others indicating relative stability. The DB-SRA model also suggests exploitation was low until the mid-1960s, rapidly rose to a peak in the early 1970s and then, according to the base model, steadily declined until the present. The estimates of both the in-river and relative exploitation rate also exhibited declines during this period, although the detailed patterns are different. Thus, while the Panel agreed biomass is lower than historical levels and fishing mortality has likely declined more recently, the extent of these reductions is highly uncertain. And, the reference points estimated by the DB-SRA were not considered credible and thus are not useful to the determination of stock status.

The SASC provided three reference points based upon total mortality (Z): $Z_{COLLAPSE}$, the amount of mortality that would cause a stock to collapse; $Z_{20\%}$, the amount that would

reduce the biomass per recruit to 20% of the unfished stock; and $Z_{40\%}$, reduced biomass to 40% of unfished biomass. A number of $Z_{COLLAPSE}$ estimates were proposed, all being generally based upon the fishing mortality (F) at a percent SPR determined by the inverse of the slope at the origin of a Beverton and Holt stock-recruitment relationship. Total mortality is determined by adding an assumed level of natural mortality. Here, an M of 1.0 was assumed. Values of $Z_{COLLAPSE}$ for alewife across rivers ranged 2.0 – 3.0 while those for blueback herring for a more limited number of rivers ranged from 1.6 – 3.2. These were well in excess of the annual estimates of age-based Z. The Panel considered the $Z_{COLLAPSE}$ reference point a useful upper limit to total mortality but it must be considered with caution given its dependence on uncertain stock-recruit relationships and assumptions on natural mortality.

The $Z_{20\%}$ and $Z_{40\%}$ reference points are analogous to the widely used $F_{20\%}$ and $F_{30\%}$ proxies of F_{MSY}. In the case of river herring, fishing mortality is assumed to include a combination of fishing and other anthropogenic and non-anthropogenic sources of mortality, most of which cannot be quantified. The percentage of maximum spawning potential used for the determination of the mortality reference point is based upon the productivity characteristics of the species, with lower percentages (15 – 20%) sustainable for highly productive species and higher percentages (35 – 40%) used for less productive species. Punt et al. (2008) determined that the percent SPR at MSY is an inverse function of the steepness parameter of the Beverton and Holt stock-recruitment relationship. A meta-analysis of steepness parameters by Myers et al. (1999) indicated the median estimate of steepness for Clupeids (such as alewife and blueback herring) was 0.71. Based on the analysis of Punt et al. (2008), this implies percentages on the order of 35 – 40% are more appropriate for river herring reference points. The Panel thus recommends that $Z_{40\%}$, rather than $Z_{20\%}$, be used as the total mortality reference point.

The $Z_{20\%}$ and $Z_{40\%}$ reference points are very sensitive to assumptions of M. The SASC developed two sets of Z reference points based on M equal to 0.3 and 0.7. It based these on a comprehensive study of published relationships between natural mortality and growth parameters such as K (Brody growth coefficient), t_{max} (the maximum age), and average temperature experienced during a year (Table 2). These growth parameters were developed with data from 1973-1983. This analysis indicated estimates of M based on longevity (t_{max}) were much lower than those based on K. The basis for this could not be determined but may indicate that elevated natural mortality is being expressed through changes in growth. The M options of 0.3 and 0.7 were considered to bracket the processes implied by this analysis.

Table 2. Estimates of river herring natural mortality (M) developed by the SASC for determination of Z reference points (provided to Panel at review meeting).

		Required Parameters					
Method	Equation	L_inf	K	t_max	P	temp	M
Alverson and Carney 1975	M = 3K/(exp[0.38*K*t_max) - 1]		X	X			0.164
Pauly 1980	M = exp[-0.0152 + 0.6543*ln(K) - 0.279*ln(L_inf/10) + 0.4634*ln(Temp)]	X	X			X	1.212
Hoenig 1983 (regression)	M = exp[1.44 - 0.982*ln(t_max)]			X			0.401
Hoenig 1983 (rule-of-thumb)	M = -ln(P)/t_max			X	X		0.382
Ralston 1987 (linear regression)	M = 0.0189 + 2.06*K		X				1.234
Jensen 1996 (theoretical)	M = 1.50*K		X				0.885
Jensen 1996 (derived from Pauly 1980)	M = 1.60*K		X				0.944
Hewitt and Hoenig 2005	M = 4.22/t_max			X			0.384

For $M = 0.3$, the $Z_{40\%}$ reference point ranged 0.46 – 0.48 for alewife and blueback herring across the rivers along the coast. For $M = 0.7$, this reference point ranged from 1.11 – 1.15. It is clear the determination of natural mortality is critical to the setting of Z reference points. There is good evidence that total mortality is high. The issue is how much of this is due to fishing and how much due to natural mortality. There is evidence from various sources that fishing mortality has likely been declining over a long period. Some of the growth parameters based on 1973-1983 data suggest M is high. It is possible that due to the depleted state of river herring stocks, multiple sources are causing high apparent natural mortality. These species are forage for many predators and are exposed to many anthropogenic threats (e.g. dams, culverts and other barriers, etc). The Panel considered that $Z_{40\%}$ for $M = 0.7$, as proposed by the SASC, is a useful reference point against which to measure total mortality.

6. Evaluate stock status determination from the assessment; if appropriate, recommend changes or specify alternative methods/measures.

Coast wide status of the stock (biomass and exploitation rates) in relation to management reference points could not be determined. The SASC attempted to estimate coast wide status using the DB-SRA model, but recognized that using estimates of current biomass and exploitation rates were dependent upon the input parameter of $B_{CURRENT}$ / K. The Panel agreed with this conclusion, and also noted estimates of F_{MSY} and historical exploitation rates were likely too low, suggesting that at its peak, the fishery was removing only 20% of the stock per year. While the Panel felt the current DB-SRA model was not to be relied on, it believed this model should be further developed, and may be a useful heuristic tool (see ToR 3).

Determination of coast wide status therefore relied on a variety of approaches, including the statistical catch at age models for individual rivers, trend analyses, and estimation of total mortality across rivers. The statistical catch at age models for individual rivers all showed sharp declines in river herring biomass. For the Monument River, alewife spawning biomass declined from a peak of around 35 MT in the mid-1990s to early 2000s to about 7 MT currently. For the Chowan River, spawning biomass of blueback herring declined from a peak of 5225 MT in the early 1980s to a current estimate of 95 MT. The models for alewife and blueback herring in the Nanticoke River, while

considered less developed than the other models, suggested similar declines in magnitude, from about 60 and 70 MT in 1989 (for alewife and blueback, respectively), to about 5 MT in recent years for both species.

In addition to the assessment approaches, the SASC explored trends in indices of abundance, mean length, mean length-at-age, and maximum age. In many systems, mean length and maximum age were lower in recent years, and length-at-age for at least one age class showed a decline. For juvenile and adult surveys indices of abundance, trends were variable.

Where total mortality (Z) could be estimated for a river system, it was compared to reference points of $Z_{20\%}$ and $Z_{40\%}$, assuming an M of 0.7 (Table 2 in the assessment). These estimates showed that in recent years (2008-2010), the average Z was higher than the $Z_{40\%}$ reference point in all cases, and higher than $Z_{20\%}$ in most cases. The Panel felt the $Z_{20\%}$ reference point was likely too high, and a Z reference point between 35-40% was more appropriate (see ToR 5), such that mortality is likely too high in all systems where Z could be estimated.

Based on the weight of evidence from these approaches, the SASC concluded the coast wide meta-complex of river herring is depleted to near historic lows. The Panel agreed with the SASC conclusion that coast wide, river herring are depleted, and current total mortality rates were too high. The SASC concluded that of the 52 in-river stocks included in their analyses, 22 are depleted, 1 is increasing, and 28 have unknown status (Table 1 in the assessment). The Panel agreed with these general findings.

The SASC and Panel also noted that one stock – the Connecticut River – was not categorized (51 of 52 were assigned to either depleted, increasing, or unknown status categories). The SASC, in conjunction with each jurisdiction's technical committee representation, determined what the most appropriate status determination for each river system. A consensus could not be reached between the SASC and Connecticut's technical committee representation. The Panel agreed with the SASC that the Connecticut River's status was depleted.

The SASC also noted that a northward shift in distribution in both species might be occurring, perhaps in relation to warming water. The SASC noted that for alewife only, stable or increasing trends in juvenile and adult indices of abundance were observed in the northern areas, while stable or decreasing trends were observed in the southern areas. The NMFS trawl survey seemed to support this notion for both species, showing increases in the north and decreases in south.

7. Review the research, data collection, and assessment methodology recommendations and make additional recommendations as warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

The Review Panel considered the SASC's research recommendations in four functional categories (population dynamics, monitoring, assessment, and implementation) but maintained their time frame suggestions. Recommendations in the stock assessment and some added by the Panel are ranked as low, moderate, or high priority with comments on justification in Table 3.

Table 3. Review Panel evaluation and prioritization of American eel research recommendations. * indicates recommendations added by the Panel.

Research recommendation	Time period	Priority	Review Panel Comments
Assessment			
*Analyze the consequences of interactions between the offshore bycatch fishery and population trends in the rivers	Short term	High	This would allow informed decisions on future mitigation measures
Improve methods to develop biological benchmarks used in assessment modeling (fecundity-at-age, mean weight-at-age for both sexes, partial recruitment vector/maturity schedules) for river herring stocks	Short term	Moderate	Panel agrees there is a need but other recommendations will have a greater impact
Explore use of peer-reviewed stock assessment models for use in additional river systems in the future as more data become available	Long term	Moderate	In addition, further develop existing models to understand coast wide differences in dynamics, etc.
Implementation			
Develop better fish culture techniques and supplemental stocking strategies for river herring	Long term	Low	Success rate in other stocking programs (e.g. Atlantic salmon, shad, etc.) has been low
Encourage studies to quantify and improve fish passage efficiency and support the implementation of standard practices	Long term	High	Dams and other impediments will continue to impact river herring; improving passage efficiency is critical to sustaining/restoring runs

Table 3, cont'd.

Research recommendation	Time frame	Priority	Relevance/Comments
Population dynamics			
Investigate contribution of landlocked versus anadromous produced fish.	Long Term	Low	Peripheral to management of coastal population
Continue genetic analyses to determine population stock structure along the coast and enable determination of river origin of incidental catch in non-targeted ocean fisheries.	Short term	High	Research underway in combination with otolith chemistry
Determine and quantify stocks impacted by mixed stock fisheries (including bycatch fisheries). Methods to be considered could include otolith microchemistry, oxytetracycline otolith marking, genetic analysis, and/or tagging.	Long Term	High	Combined with above.
Develop models to predict the potential impacts of climate change on river herring distribution and stock persistence.	Short term	Low	Premature given state of data and model developments; need to link to population dynamics
Validate [better estimate] the different values of *M* for river herring stocks and improve methods for calculating *M*.	Long term	High	Important to understand sources of high *M* (e.g. predation, habitat, etc)
Continue to assess current ageing techniques for river herring, using known-age fish, scales, otoliths, and spawning marks.	Short term	High	Review panel fully supports this recommendation
Conduct biannual ageing workshops to maintain consistency and accuracy in ageing fish sampled in state programs.	Long term	High	Important for ageing program quality assurance
Summarize existing information on predation by striped bass and other species; quantify consumption through modeling (e.g., MSVPA), diet, and bioenergetics studies.	Long term	Moderate	Important but sort out *M* issue (above) first
Investigate the relation between juvenile river herring production and subsequent year class strength, with emphasis on the validity of juvenile abundance indices, rates and sources of immature mortality, migratory behavior of juveniles, and life history requirements.	Long term	High	Has potential to indicate relative role of production (catch plus growth) and environment in recruitment strength, however, not easily achievable
Evaluate the performance of hatchery fish in river herring restoration.	Long term	Low	Due to low current hatchery production

Table 3, cont'd.

Research recommendation	Time period	Priority	Review Panel Comments
Monitoring			
Improve reporting of harvest by water body and gear.	Short term	High	The Panel agrees this should be a priority at all levels.
Investigate additional sources of historical catch data of the U.S. small pelagic fisheries to better represent or construct earlier harvest of river herring.	Short term	Moderate	Would assist current model formulation but would not facilitate interpretation of current status
Develop and implement monitoring protocols and analyses to determine river herring population responses and targets for rivers undergoing restoration (dam removals, fishways, supplemental stocking, etc.).	Short term	High	Also should be assessing success of moratoria
Develop comprehensive angler use and harvest survey techniques for use by Atlantic states with open or future fisheries to assess recreational harvest of river herring.	Long term	Low	It is a higher priority to address issues in larger fisheries
Expand observer and port sampling coverage to quantify additional sources of mortality for alosine species, including bait fisheries, as well as rates of incidental catch in other fisheries.	Long term	High	However, first undertake statistical study of observer allocation and coverage (see Hanke et al., 2011 for example)
Evaluate and ultimately validate large-scale hydroacoustic methods to quantify river herring escapement (spawning run numbers) in major river systems.	Long term	Moderate	Considered an adjunct to current monitoring systems and would have to be implemented in tandem
* Explore the sources of and provide better estimates of incidental catch in order to reduce uncertainty in incidental catch estimates.	Short term	High	Explore existing data but also observer coverage analysis as indicated above
*Develop bottom and mid-water trawl CPUE indices of offshore biomass.	Short term	Moderate	This is exploratory, data are available and may or may not provide useful indices
*Consider the use of GLM to provide better trend estimates and to better characterize uncertainty in trends.	Short term	Moderate	GLM provides a general statistical structure to the description of uncertainty in stock indices

8. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

The Panel completely agrees with the SASC's recommended time frame and justification for an update of the trend analysis in 5 years followed by a benchmark assessment in 10 years.

> "We recommend an update of trend analyses in 5 years and the next benchmark assessment for river herring be conducted in 10 years (finalized in 2022). Due to the high variability of fisheries independent surveys, a benchmark assessment at a shorter timeframe (e.g. 5 years) will likely not show any significant changes in indices of abundance. Any population changes resulting from closures of fisheries in 2012; improved access to historic spawning grounds; and additional beneficial management measures, such as sustainable fishing plans and action by the federal councils, cannot be expected to result in any population change until at least one cohort of river herring has grown to maturity (assuming age at maturity is 3 – 6 years). A 10 year timeframe for the next benchmark assessment will also allow a longer time series of estimated total incidental catch in non-targeted ocean fisheries to be evaluated." (Sec 3.2 Stock Assessment Report)

In addition, the Panel also believes that the 5 year interval prior to the trend assessment will allow for the results of more recent fishing moratoria to be evaluated.

Advisory Report

A. Status of stocks: Current and projected, where applicable

The coast wide meta-complex of river herring is depleted to near historic lows. Analysis of trends in abundance, mean length, and maximum age, as well as estimates of total mortality for 52 in-river stocks of alewife and blueback herring for which data were available indicated that 22 were depleted, 1 stock was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short (see response to ToR 6 for more on status determination). In addition, stock assessments for 3 rivers (the Monument, Nanticoke, and Chowan), representing a broad geographic range, indicate populations are at very low levels. Total mortality rates in all systems explored were higher than the benchmark $Z_{40\%}$, and most were above the $Z_{20\%}$ benchmark. The Panel felt a benchmark closer to $Z_{40\%}$ was more appropriate, such that mortality is likely too high in all systems where it was estimated. Determining the relative contribution of various factors to this mortality is difficult given the limited data, but it is likely that a number of factors will need to be addressed, including fishing (both in-river and ocean bycatch), water passageways, water quality, predation, and climate change, to allow for the recovery of river herring.

B. Stock Identification and Distribution

There are no formal reports of stock identification for alewife and blueback herring. An ongoing study, funded by the National Fish and Wildlife Foundation (NFWF), is currently assessing both genetic and otolith biomarkers to associate both species back to specific regions and, where possible, specific watersheds. However, existing data suggest anadromous alewife exchange genes between adjacent watersheds (cf. Palkovacs et al. 2008). This implies genetic markers will not be able to resolve populations to the level of individual rivers, although one goal of the NFWF project is to determine whether there is greater ability to identify stocks in large rivers vs. small, coastal streams.

Alewife and blueback herring have extensive ranges along the North American east coast (Schmidt et al. 2003). Alewife range from Newfoundland to North Carolina; blueback herring are found from New Brunswick, Canada as far south as the St. Johns River in Florida (McBride et al. 2010). Alewife is more common in the northern end of their range overlap, and blueback herring is more common in the southern end.

C. Management Unit

River herring are managed on a state or watershed level, as coordinated by the ASMFC. Genetic work to verify distinct populations by river is ongoing (see B above; E. Palkovacs, Duke University, personal communication), but as with American shad it appears reasonable. It is also reasonable to consider a regional scale, within which rivers are grouped by geography and physiography, with particular attention to how spawning adults might encounter a river via ingress from the ocean, sounds (e.g., Albemarle, Pamlico, Long Island), or bays (e.g., Chesapeake, Cape Cod).

D. Landings

Total coast-wide landings of river herring in the U.S. averaged 18.5 million pounds from 1887 to 1928; although landings information was sparsely reported in many areas, likely under-reported (see ToR 1), and not available in some years. Reported values during this period ranged from 22,000 pounds to a high of 85.5 million pounds. Landings from this period were predominately reported from Maryland, North Carolina, Virginia, and Massachusetts. Overall landings during this period are likely underestimates due to inconsistent reporting.

Coast wide landings increased sharply from lows in the early 1940s to more than 50 million pounds by 1951 and peaked at 74.9 million pounds in 1958. Severe declines in landings began coast wide in the early 1970s and domestic landings are now a fraction of what they were at their peak, having remained at persistently low levels since the mid-1990s. Moratoria have been enacted in Massachusetts (commercial and recreational in 2005), Rhode Island (commercial and recreational in 2006), Connecticut (commercial and recreational in 2002), Virginia (for waters flowing into North Carolina in 2007), and North Carolina (commercial and recreational in 2007). As of January 1, 2012 river herring fisheries in states or jurisdictions without an approved sustainable fisheries management plan, as required under ASMFC Amendment 2 to the Shad and River Herring FMP, were closed. As a result, prohibitions on harvest (commercial or recreational) were extended to the following states: New Jersey, Delaware, Pennsylvania, Maryland, D.C., Virginia (for all waters), Georgia and Florida.

River herring are caught incidentally (termed incidental catch) in a number of different ocean fisheries. Some incidental catch is retained, and the remainder is discarded, but quantifying the total incidental catch and the amount retained versus discarded is problematic. Although estimates of incidental catch are available starting in 1989, the sampling of mid-water trawl (MWT) vessels was sparse prior to 2005. Since MWT vessels collect a large portion of the total incidental catch, estimates of total incidental catch prior to 2005 are deemed unreliable. There are additional factors adding to the uncertainty in the estimation of incidental catch of river herring. First is the error in identifying river herring by species. Second is an unidentified category of incidental catch labeled herring NK (for not known), which also includes Atlantic herring, and the relative proportion of river herring in this category is unknown. Finally, it is unknown how much of the estimated incidental catch also gets reported as landed catch, such that estimates of incidental catch may be biased high in certain years.

Estimation uncertainty notwithstanding, from 2005-2010, the total annual incidental catch of alewife ranged from 19.0-473.3 MT in New England and 8.9-256.2 MT in the Mid-Atlantic. Estimates of precision (coefficients of variation) exhibited substantial interannual variation and ranged from 0.28-3.12 across gears and regions.

Total annual blueback herring incidental catch from 2005-2010 ranged from 13.9–176.5 MT in New England and 1.2-382.6 MT in the Mid-Atlantic. During this period, estimates of total incidental catch are of comparable magnitude to commercial landings. Given the high estimates of incidental catch (and the high degree of uncertainty in these estimates), particularly in relation to total landings, the Review Panel felt that obtaining a

better understanding of the incidental catch of river herring is imperative (see Research Recommendations in ToR 7).

Recreational catches of river herring remains largely unknown. The Marine Recreational Information Program (MRIP) estimates the numbers of river herring harvested and released by anglers, but estimates are very imprecise, show little trend, and are deemed not useful for management purposes. MRIP concentrates their sampling strata in coastal waters and does not capture data on recreational fisheries occurring in inland waters. Few states conduct creel surveys or other consistent survey instruments (diary or log books) in inland waters to collect data on recreational catch of river herring. Some data are reported in the state chapters of the current stock assessment, but data are too sparse to conduct systematic comparisons of trends.

E. Data and Assessment

Data

Fishery dependent data were deemed of limited use by the SASC due to problems with documentation of mixed species, data gaps, combined sexes, and variable catchability of gear over time (see ToR 1). The Panel believes that the increasing number of state fishing moratoria will continue to reduce this source of data. Fishery independent data were considered more reliable and used for state and coast wide trend analyses of catch per unit effort. The absence of consistent trends in the fishery-independent data was observed as decreases in regions south of Long Island and increase in northern locations. The reason for this discrepancy may be due to the relatively short duration of the time series available as noted in ToR 1. By the next assessment, time series should provide a more complete indication of state and coast wide trends in both river herring species.

The SASC utilized the biological data (age, length, weight) to its fullest practical extent in their trend analyses as well as mortality estimates. The Panel would like to emphasize the need for caution in the analyses that use age data and believe the need for a standardized and validated ageing method would enhance the use of life history traits in future assessments (see ToR 1).

Overall, the Review Panel believes the SASC made good use of the reliable data that were available.

Assessment

Besides examining trends in fishery-dependent and -independent indices of abundance, the SASC pursued three main categories of analyses to estimate population parameters: 1) river-specific total mortality (Z) with associated Z reference points based upon a Spawner per Recruit (SPR) analysis; 2) estimation of both river-specific and coast wide exploitation rates (u), and 3) two sets of population models, one set for specific rivers (Monument, Chowan, and Nanticoke) and a second set for the coast wide stock.

The Z estimates were based on application of the Chapman-Robson (1960) survival analysis to age frequency information available for many of the coast's rivers from a variety of fishery-dependent and -independent sources. The method makes a number of

assumptions including representative sampling of the abundance of each year-class, the first age of full recruitment as the age class with the highest frequency of occurrence, and the selectivity for all fully recruited ages being one. In addition, as with all age-based methods, accuracy in the ageing data is assumed. Problems in age reading of river herring scales have been noted and thus the SASC undertook an analysis of repeat spawner data available for each stock component. The Panel was concerned that while this analysis would address the ageing issue, other issues may be present. Specifically, skip spawning would produce biased (high) estimates of Z. If spawning checks and scale rings were annual, both estimates should be highly correlated, which was not the case. On balance, the Panel preferred the age-based Z estimates for use with the Z reference points noted below.

Regarding exploitation rates, river-specific values were estimated for five New England rivers by dividing the in-river harvest by the total run size (escapement plus harvest) for a given year. While useful for these rivers, the approach has limited broader utility due to the lack of data. Relative exploitation rates were estimated for the coast-wide river herring population by dividing the annual estimate of total catch by an index of total biomass. A coast wide rather than regional or river-based estimate was calculated due to the inability to partition incidental catch to region or river. This method can produce adequate trends in relative exploitation as long as its assumptions are not severely violated. Here, the catch comes from both freshwater and marine environments while the biomass index is only from the latter at one time of the year (spring). The age/size composition of the catch and survey index may be very different. There is evidence that the size composition of the freshwater landings and marine incidental catch are different (ToR 2) but no evidence on survey size composition was provided. The Panel considered that while the results were interesting, they require further verification of the approach's assumptions before being used.

Regarding the population models, the set of Statistical Catch at Age (SCAA) models developed for the Monument (MA), Chowan (NC), and Nanticoke (MD) rivers differed significantly in a number of details but overall were innovative implementations. The Monument model was the most advanced while the Nanticoke model was the least developed. Overall, while none of the models are appropriate to inform management decisions at the coast wide scale, the Panel considered the SCAA models innovative and strongly urged further developments. In addition, they provide platforms for the study of alewife and blueback herring population dynamics at both the river and coast wide scale (see ToR 3). Further efforts to expand SCAA models to other rivers as data and resources permit are strongly encouraged.

The depletion-based stock reduction analysis (DB-SRA) developed for the coast-wide river herring population, while also innovative (see ToR for details), was strongly constrained by the input assumption on current depletion (assumed to be on the order of 10% of virgin biomass). The model also produced an estimate of U_{MSY} (0.06) which appears to be unrealistically low. This may be due to a mis-specified production function. A further complication is that the dynamics of two species (alewife and blueback herring) are being jointly modeled. In summary, the DB-SRA model did not adequately model river herring stock conditions and should not be used to assess status. On the other hand, it is a valuable heuristic tool to explore the possible dynamics of the

resource and guide future modeling efforts which more explicitly incorporated observational informational as part of an optimization process.

Overall, data were insufficient to allow assessment of the coast wide state of the river herring resource, requiring resort to the description of abundance and mortality trends in the river-specific fishery dependent and independent indices.

F. Biological Reference Points

It is only possible to reach consensus on total mortality (Z) reference points associated with the analysis of the annual age-frequency data available by state, river, species, sex and year. The SASC provided three reference points based upon total mortality (Z): $Z_{COLLAPSE}$, the amount of mortality that would cause a stock to collapse; $Z_{20\%}$, the amount that would reduce the biomass per recruit to 20% of the unfished stock; and $Z_{40\%}$, reduced biomass to 40% of unfished biomass. These were all based upon an analysis of spawner per recruit dynamics (see ToR 5 for details).

Values of $Z_{COLLAPSE}$ for alewife across rivers ranged from 2.0-3.0 while those for blueback herring for a more limited number of rivers ranged 1.6-3.2. The Panel considered the $Z_{COLLAPSE}$ reference point as a useful upper limit to total mortality but must be considered with caution given its dependence on uncertain stock-recruit relationships and assumptions on natural mortality.

The $Z_{20\%}$ and $Z_{40\%}$ reference points are analogous to the widely used $F_{20\%}$ and $F_{30\%}$ proxies of F_{MSY} in which the percentage of maximum spawning potential used for the determination of the mortality reference point is based upon the productivity characteristics of the species, with lower percentages (15-20%) sustainable for highly productive species and higher percentages (35-40%) used for less productive species. Based on a meta-analysis of Pacific groundfish stocks (Punt et al, 2008) which examined how optimal harvest rates change with a stock's production dynamics, the Panel recommends that $Z_{40\%}$, rather than $Z_{20\%}$, be used as the total mortality reference point. The $Z_{40\%}$ reference point is very sensitive to assumptions of M. The SASC developed two sets of reference points based on natural mortality (M) equal to 0.3 and 0.7. There is good evidence that total mortality (Z) is high and there is evidence from various sources that fishing mortality has likely been declining over a long period. This suggests that M is closer to 0.7 than 0.3. The Panel therefore considered $Z_{40\%}$ for $M = 0.7$, as proposed by the SASC, as a useful reference point against which to measure total mortality.

G. Fishing Mortality

Estimation of coast wide exploitation on the river herring meta-complex was not possible. Attempts were made using DB-SRA, but precise estimates from this model were deemed unrealiable by the Review Panel. The DB-SRA model resulted in very low estimates of exploitation, suggesting that only 20% of the population was removed each year during peak exploitation in the late 1960s and early 1970s. Comparisons of temporal F values and estimates of F_{MSY} from the DB-SRA model with estimates from

the statistical catch at age (SCAA) models for the Monument, Nanticoke, and Chowan Rivers suggest DB-SRA values are likely very low.

While the magnitude of DB-SRA estimates of exploitation is unreliable, the trends in recent years may not be. Most of the DB-SRA runs showed peak exploitation rates in the late 1960s and early 1970s, followed by a decline in recent years. This declining trend in exploitation rates is supported by the index of relative exploitation calculated using data from the Spring NMFS trawl survey. Also, exploitation rates estimated from the statistical catch-at-age model for blueback herring in the Chowan River showed a slight declining trend from 1999 to 2007 at which time a moratorium was instituted. There appears to be support among various assessment methodologies that exploitation has decreased in recent times. The Review Panel concurred with the notion of a decline in exploitation rates, particularly over the past decade because more restrictive regulations or moratoria have been enacted by states.

H. Recruitment

Recruitment trends were examined using Cluster Analysis in the time series of the state-run Young-of-Year (YOY) seine surveys conducted on a number of rivers along the coast. For 1980-2007 and 1993-2007, the analysis identified five groups based upon abundance trends over time. However, these groups were not geographically based (e.g. group 1 consisting of rivers in the northern part of the stock range) but rather, different temporal patterns occurred along the extent of the coast. Overall, of the rivers included in the analysis, for alewife, six exhibited either no change in abundance or a decline with only one exhibiting an increase in abundance. For blueback herring, all eight rivers exhibited either no change or a decline. The extent to which the YOY surveys indicate recruitment to the population is not clear, being indices of the young of the year, a life stage which experiences significant mortality. Thus, trends must be interpreted with caution.

I. Spawning Stock Biomass

Coast wide status of the stock biomass in relation to management reference points could not be determined. While coast wide biomass was relatively high prior to the 1960s, after which it declined rapidly, there is considerable uncertainty in more recent trends, with some DB-SRA model formulations suggesting a small increase, while others indicated relative stability. The base DB-SRA model also suggested exploitation was low until the mid-1960s, rapidly rose to a peak in the early 1970s, and then steadily declined until the present. Thus, while biomass is lower than historical levels and fishing mortality has likely declined more recently, the extent of these reductions is highly uncertain.

J. Bycatch

See ToR 2 above.

K. Other Comments – None.

L. Sources of Information (Literature Cited)

ASMFC. 2007. Terms of Reference & Advisory Report to the American Shad Stock Assessment Peer Review. Limburg, K.E., J. Gibson, B. Pine, T. Quinn, and N.J. Sands. Stock Assessment Report No. 07-01 of the Atlantic States Marine Fisheries Commission. Arlington, VA.

Cating, J.P. 1953. Determining age of Atlantic shad from their scales. U.S. Fish Wildl. Serv. Fish. Bull. 54:187-199.

Chapman, P. Sr. 1884. Habits of the shad and herring, as they appear in the Potomac River to one who has watched them for fifty years. Bulletin of the United states Fish Commission 4: 61 - 64.

Collette, B.B. and G. Klein-MacPhee. 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine (Third Edition). Smithsonian Institution Press, Washington, DC.

CSAS. 2012. Assessment of Northern Shrimp on the eastern Scotian Shelf (SFAs 13 – 15). Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/01.

Dick, E.J. and A.D. MacCall. 2011. Depletion-Based Stock Reduction Analysis: a catch-based method for determining sustainable yields for data-poor fish stocks. MS

Dorn, M. 2011. Assessment methods for data-poor stocks. Report of the Review Panel meeting. SWFSC, NMFS report. 24 pp.

Duffy, W.J., R.S. McBride, S.X. Cadrin, and K. Oliveira (2011) Is Cating's method of transverse groove counts to annuli applicable for all stocks of American shad? Transactions of the American Fisheries Society. 140 (4): 1023-1034

Fournier, D. 2011. An Introduction to AD Model Builder for Use in Nonlinear Modeling and Statistics. Version 10. http://admb-project.org/documentation/manuals/admb-user-manuals.

Hall, C.J., A. Jordaan, and M.G. Frisk. In press. Centuries of anadromous forage fish loss: consequences for ecosystem connectivity and productivity. BioScience.

Hanke, A.R., Andrushchenko, I. and Croft, G. 2011. Observer coverage of the Atlantic Canadian swordfish and other tuna longline fisheries: an assessment of current practices and alternative methods. CSA Working Paper 2011/28.

Helser, T. E. and D. B. Hayes. 1995. Providing quantitative management advice from stock abundance indices based on research surveys. Fishery Bulletin 93: 290 – 298.

Limburg, K.E., and J. R. Waldman. 2009. Dramatic declines in North Atlantic diadromous fishes. BioScience 59: 955-965.

Marcy, B. C. 1969. Age determination from scales of *Alosa pseudoharengus* (Wilson) and Alosa aestivalis (Mitchill) in Connecticut waters. Transactions of the American Fisheries Society 98:622–630.

McAllister MK, Ianelli JN. 1997. Bayesian stock assessment using catch-age and the sampling- importance resampling algorithm. Can J Fish Aquat Sci 54: 284-300.

McBride, R. S., M. L. Hendricks, and J. E. Olney. 2005. Testing the validity of Cating's (1953) method for age determination of American shad using scales. Fisheries Research 30:10–18.

McBride, R.S., J.E. Harris, A.R. Hyle, and J.C. Holder. 2010. The spawning run of blueback herring in the St. Johns River, Florida. Transactions of the American Fisheries Society 139: 598-609.

Myers, R.A., K.G. Bowen and N. Barrowman. 1999. Maximum reproductive rate of fish and low population sizes. Can. J. Fish. Aquat. Sci. 56: 2404 – 2419.

New York Times (NYT). 1895. Potomac herring fishing. They are taken in large quantities about Washington. April 14, 1895.

Palkovacs, E.P., K.B. Dion, D.M. Post, and A. Caccone. 2008. Independent evolutionary origins of landlocked alewife populations and rapid parallel evolution of phenotypic traits. Molecular Ecology 17: 582-597.

Punt, A.E., D.C. Smith, and A.D.M. Smith. 2011. Among-stock comparisons for improving stock assessments of data-poor stocks: the "Robin Hood" approach. ICES Journal of Marine Science 68: 972-981.

Schmidt, R.E., B.M. Jessop, and J.E. Hightower. 2003. Status of river herring stocks in large rivers. Pages 171–182 in K.E. Limburg and J.R. Waldman, editors. Biodiversity, status, and conservation of the world's shads. American Fisheries Society, Symposium 35, Bethesda, Maryland.

Stevenson, C. H. 1899. The shad fisheries of the Atlantic coast of the United States. Pages 101-269 in U.S. Commission of Fish and Fisheries, Part XXIV. Report of the Commissioner for the year ending June 30, 1898. Government Printing Office, Washington, D.C.

Wigley, S.E., P.J. Rago, K.A. Sosebee, and D.L. Palka. 2007. The analytic component to the Standardized Bycatch Reporting Methodology Omnibus Amendment: sampling design end estimation of precision and accuracy (2nd edition). U.S. Dept. Commerce, Northeast Fish. Sci. Cent. Ref. Doc. 07-09; 156 p.

2012 WL 752323
Only the Westlaw citation is currently available.

Michael S. FLAHERTY, et al., Plaintiffs,
v.
John BRYSON,1 in his official capacity as Secretary of the Department of Commerce, et al., Defendants.

Attorneys and Law Firms

Erica Fuller, Earthjustice, Ipswich, MA, Roger M. Fleming, Earthjustice, Appleton, ME, Stephen Elston Roady, Earthjustice, Washington, DC, for Plaintiffs.

Kristen Byrnes Floom, Rachel K. Bowen, U.S. Department of Justice, Washington, DC, for Defendants.

Opinion

MEMORANDUM OPINION

GLADYS KESSLER, District Judge.

***1** Plaintiffs Michael S. Flaherty, Captain Alan A. Hastbacka, and the Ocean River Institute bring this suit against Defendants Commerce Secretary Gary Locke, the National Oceanic and Atmospheric Administration ("NOAA"), and the National Marine Fisheries Service ("NMFS"). Plaintiffs allege that Amendment 4 to the Atlantic Herring Fishery Management Plan violates the Magnuson–Stevens Fishery Conservation and Management Act ("MSA"), 16 U.S.C. §§ 1801 *et seq.*, the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 *et seq.*, and the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 702 *et seq.*

This matter is now before the Court on Cross–Motions for Summary Judgment [Dkt. Nos. 17, 19]. Upon consideration of the Motions, Oppositions, Replies, Oral Argument, Supplemental Briefs, the entire record herein, and for the reasons stated below, Plaintiffs' Motion for Summary Judgment is **granted in part and denied in part** and Defendants' Motion for Summary Judgment is **granted in part and denied in part.**

I. BACKGROUND

A. Statutory Background

1. The Magnuson–Stevens Act

Congress first enacted the MSA in 1976 "to take immediate action to conserve and manage the fishery resources found off the coasts of the United States." 16 U.S.C. § 1801(b)(1). The Act provides a "national program" designed "to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources." *Id.* § 1801(a)(6).

In order to balance the need for "a cohesive national policy and the protection of state interests," the MSA establishes eight Regional Fishery Management Councils composed of federal officials, state officials, and private parties appointed by the Secretary of Commerce. *C & W Fish Co. v. Fox,* 931 F.2d 1556, 1557 (D.C.Cir.1991); 16 U.S.C. § 1852. These councils are responsible for developing fishery management plans ("FMPs") for fisheries in federal waters within the United States Exclusive Economic Zone, which includes ocean water from three to two hundred miles offshore. *Id.* § 1853.

Each council must prepare and submit to NMFS2 an FMP and any amendments that may become necessary "for each fishery under its authority that requires conservation and management." *Id.* § 1852(h)(1). FMPs must include the "conservation and management measures" that are "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 longterm health and stability of the fishery."3 *Id.* § 1853(a)(1)(A). FMPs must also be consistent with the ten "National Standards" provided for in the MSA, as well as all other provisions of the MSA, and "any other applicable law." *Id.* § 1853(a)(1)(C); *see also id.* § 1851 (setting forth National Standards).

***2** Once a council has developed a plan, NMFS must review the plan to determine whether it comports with the ten National Standards and other applicable law. *Id.* § 1854(a)(1)(A). Next, after a period of notice and comment, NMFS must "approve, disapprove, or partially approve a plan or amendment," depending on whether the plan or amendment is consistent with the Standards and applicable law. *Id* . § 1854(a)(3). Even if NMFS disapproves the proposed FMP or amendment, it may not rewrite it. That responsibility remains with the council, except under specifically defined circumstances. *Id.* §§ 1854(a)(4), (c). If NMFS approves the plan or does not express disapproval within 30 days, the FMP becomes effective. *Id.* § 1854(a)(3).

At the beginning of 2007, Congress re-authorized and amended the MSA. Magnuson–Stevens Fishery Conservation and Management Reauthorization Act of 2006 ("MSRA"), P.L. 109–479, 120 Stat. 3575 (2007). One of the goals of the MSRA was to "set[ ] a firm deadline to end overfishing in America." 2007 U.S.C.C.A.N. S83, S83. To accomplish this purpose, Congress added provisions to the MSA calling for science based limits on total fish caught in each fishery.

The amended MSA requires the regional councils to add to all FMPs mechanisms for setting the limits, termed Annual Catch Limits ("ACLs"), on the amount of fish caught and accountability measures ("AMs") for ensuring compliance with the ACLs. 16 U.S.C. § 1853(a)(15). These limits and accountability measures must take effect "in fishing year 2011" for most fisheries, including the Atlantic herring fishery.4 Pub.L. No. 109–479, § 104(b), 120 Stat. 3575, 3584.

2. The National Environmental Policy Act

Congress enacted NEPA in order "to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may ... fulfill the responsibilities of each generation as trustee of the environment for succeeding generations." 42 U.S.C. § 4331(b). To accomplish that goal, NEPA requires all federal agencies to prepare an Environmental Impact Statement ("EIS") whenever they propose "major Federal actions significantly affecting the quality of the human environment." *Id.* § 4332(2)(C).

To determine whether an EIS must be prepared, the agency must first prepare an environmental assessment ("EA"). 40 C.F.R. § 1501.4(b). An EA must "[b]riefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." *Id.* § 1508.9(a). Even if the agency performs only an EA, it must still briefly discuss the need for the proposal, the alternatives, and the environmental impacts of the proposed action and the alternatives. *Id.* § 1508.9(b). If the agency determines, after preparing an EA, that a full EIS is not necessary, it must prepare a Finding of No Significant Impact ("FONSI") setting forth the reasons why the action will not have a significant impact on the environment. *Id.* §§ 1501.4(e), 1508.13.

B. Factual Background

*3 Plaintiffs challenge Amendment 4 to the Atlantic Herring Fishery Management Plan, developed by the New England Fishery Management Council (the "Council"). 76 Fed.Reg. 11373 (Mar. 2, 2011). Atlantic herring *(Clupea harengus)* have been managed through the Atlantic Herring FMP since January 10, 2001. Administrative Record ("AR") 5578.

Atlantic herring inhabit the Atlantic Ocean off of the East coast of the United States and Canada, ranging from North Carolina to the Canadian Maritime Provinces. *Id.* at 6091. Atlantic herring can grow to about 15.6 inches in length and live 15–18 years. *Id.* at 6092. Atlantic herring play a vital role in the Northwest Atlantic ecosystem, serving as a "forage species," i.e. food, for a number of other fish, marine mammals, and seabirds. *Id.* at 6111.

Human beings also hunt Atlantic herring. Fishermen and women predominantly catch Atlantic herring using midwater trawl gear, paired midwater trawls, and purse seines. AR 6146. To do this, boats working alone or in tandem drag nets through the water scooping up fish as they go. Not surprisingly, these nets snare large numbers of other fish and marine wildlife at the same time. *Id.* at 6146–48, 6170–80.

Of particular concern to Plaintiffs are four species, often caught incidentally with Atlantic herring, collectively referred to as "river herring": (1) blueback herring *(Alosa aestivalis),* (2) alewive *(Alosa pseudoharengus),* (3) American shad *(Alosa sapidissima),* and (4) hickory shad *(Alosa mediocris). See* Pls.' Mot. 1. River herring are apparently so-called because they are anadromous—that is, they spawn in rivers but otherwise spend most of their lives at sea, whereas Atlantic herring spend their entire lives at sea. *Id.* It is undisputed that river herring play a similar role to Atlantic herring, providing forage for large fish and mammals, including cod, striped bass, bluefin tuna, sharks, marine mammals, and seabirds. *Id.* at 1, 8; see *also* AR 763–64. The Atlantic Herring Fishery Management Plan, as updated by Amendment 4, provides ACLS and AMs for Atlantic herring but not for river herring.

C. Procedural Background

On May 8, 2008, NMFS published a Notice of Intent, announcing that the Council would be preparing Amendment 4 to the Atlantic Herring FMP as well as an Environmental Impact Statement. AR 5577. The Notice explained that the MSRA required that ACLs and AMs be established by 2011 for all fisheries not subject to overfishing. *Id.* at 5578. Because the Atlantic herring fishery had not been determined to be subject to

overfishing, Amendment 4 was "necessary to update the Herring FMP in a manner ... consistent with the new requirements of the MSRA" and was required to be in place by 2011. *Id.*

The Notice also indicated measures under consideration by the Council. Specifically, the Notice stated that Amendment 4 might address as many as five objectives:

> *4 1. To implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;
>
> 2. To implement ACLs and AMs consistent with the MSRA;
>
> 3. To implement other management measures as necessary to ensure compliance with the new provisions of the MSRA;
>
> 4. To develop a sector allocation process or other LAPP ["Limited Access Privilege Program"] for the herring fishery; and
>
> 5. In the context of objectives 1–4 (above), to consider the health of the herring resource and the important role of herring as a forage fish and a predator fish throughout its range.

Id.

However, on December 28, 2009, NMFS and the Council changed course. At that time, NMFS issued a second Notice of Intent explaining that "only the ACL/AM components will move forward as Amendment 4, and that the Council intends to prepare EA for the action." *Id.* at 5640–41. In addition, "[a]ll other proposed measures formerly included in Amendment 4, including the catch monitoring program for the herring fishery, measures to address river herring bycatch, criteria for midwater trawl access to groundfish closed areas, and measures to address interactions with the mackerel fishery, will now be considered in Amendment 5." *Id.* at 5641. The Notice also promised that those "measures will be analyzed in an EIS" to be issued with Amendment 5. *Id.*

In short, the Government dropped from Amendment 4 any attempt to add protections for fish other than the Atlantic herring, such as the river herring of concern to Plaintiffs in this litigation, electing only to address Atlantic herring ACLs and AMs.

On March 2, 2011, NMFS published Amendment 4 as a Final Rule in the Federal Register. *Id.* at 6325. In keeping with the December 28, 2009 Notice of Intent, Amendment 4 designated Atlantic herring as the only "stock in the fishery" and did not provide for any measures specifically targeted at protecting river herring. *Id.* at 6326. The Final Rule implemented an Interim Acceptable Biological Catch ("ABC") Control Rule for Atlantic herring, from which ACLs could then be determined. *Id.* at 6327. The Final Rule also established three AMs: (1) when a threshold amount of Atlantic herring is caught, NMFS is to close relevant management areas; (2) if a certain amount of haddock is incidentally caught, vessels are to face restrictions; and (3) if the total amount of Atlantic herring caught in a year exceeds any ACL or sub-ACL, the ACL or sub-ACL is to be reduced by a corresponding amount in the year after the calculation is made. *Id.*

On April 1, 2011, Plaintiffs filed their Complaint [Dkt. No. 1]. Plaintiffs allege that: (1) Defendants violated the MSA and APA by failing to include catch limits for river herring in Amendment 4; (2) Defendants violated the MSA and APA by failing to set adequate ACLs for Atlantic herring in Amendment 4; (3) Defendants violated the MSA and APA by failing to set adequate AMs for Atlantic herring in Amendment 4; and (4) Defendants violated NEPA by failing to develop an EIS for Amendment 4. Compl. ¶¶ 70–113.

*5 On September 9, 2011, Plaintiffs filed their Motion for Summary Judgment ("Pls.' Mot.") [Dkt. No. 17]. On October 7, 2011, Defendants filed their Opposition to Plaintiffs' Motion and Cross–Motion for Summary Judgment ("Defs.' Mot.") [Dkt. No. 19]. On October 28, 2011, Plaintiffs filed their Reply to Defendants' Opposition and Opposition to Defendants' Motion ("Pls.' Reply") [Dkt. No. 20]. On November 18, 2011, Defendants filed their Reply to Plaintiffs' Opposition ("Defs.' Reply") [Dkt. 22]. On January 4, 2012, oral argument on the cross-motions was heard by this Court. On January 11, 2012, with the Court's permission, Defendants and Plaintiffs filed respective Supplemental Memoranda ("Defs.' Supp. Mem." and "Pls.' Supp. Mem.") [Dkt. Nos. 27 and 28].

II. STANDARD OF REVIEW

Summary judgment will be granted when there is no genuine issue as to any material fact. *See* Fed.R.Civ.P. 56(c). Because this case involves a challenge to a final administrative decision, the Court's review on summary judgment is limited to the Administrative Record. *Holy Land Found. for Relief and Dev. v. Ashcroft,* 333 F.3d 156, 160 (D.C.Cir.2003) (citing *Camp v. Pitts,* 411 U.S. 138, 142, 93 S.Ct. 1241, 36 L.Ed.2d 106 (1973)); *Richards v. INS,* 554 F.2d 1173, 1177 (D.C.Cir.1977) ("Summary judgment is an appropriate procedure for resolving a challenge to a federal agency's administrative

decision when review is based upon the administrative record.").

Agency decisions under the Magnuson–Stevens Act and NEPA are reviewed pursuant to Section 706(2) of the APA. 16 U.S.C. § 1855(f)(1)(B) ("the appropriate court shall only set aside" actions under the MSA "on a ground specified in [5 U.S.C. §§] 706(2)(A), (B), (C), or (D)."); *Oceana, Inc. v. Locke,* ——F.3d ——, No. 10–5299, 2011 WL 2802989, at *2 (D.C.Cir. July 19, 2011); *C & W Fish,* 931 F.2d at 1562; *Oceana v. Locke,* F.Supp.2d, No. 10–744(JEB), 2011 WL 6357795, at *8 (D.D.C. Dec.20, 2011). In relevant part, 5 U.S.C. § 706(2) requires a court to hold agency action unlawful if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."

The arbitrary and capricious standard of the APA is a narrow standard of review. *Citizens to Preserve Overton Park, Inc. v. Volpe,* 401 U.S. 402, 416, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971). It is well established in our Circuit that the "court's review is ... highly deferential" and "we are 'not to substitute [our] judgment for that of the agency' but must 'consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.' " *Bloch v. Powell,* 348 F.3d 1060, 1070 (D.C.Cir.2003) (quoting *S. Co. Servs., Inc. v. FCC,* 313 F.3d 574, 579–80 (D.C.Cir.2002)); *see also United States v. Paddack,* 825 F.2d 504, 514 (D.C.Cir.1987). However, this deferential standard cannot permit courts "merely to rubber stamp agency actions," *NRDC v. Daley,* 209 F.3d 747, 755 (D.C.Cir.2000), nor be used to shield the agency's decision from undergoing a "thorough, probing, in-depth review." *Midtec Paper Corp. v. United States,* 857 F.2d 1487, 1499 (D.C.Cir.1988) (internal citations and quotations omitted).

***6** An agency satisfies the arbitrary and capricious standard if it "examine [s] the relevant data and articulate[s] a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.' " *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.,* 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) (quoting *Burlington Truck Lines v. United States,* 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962)); *Lichoulas v. FERC,* 606 F.3d 769, 775 (D.C.Cir.2010). Finally, courts "do not defer to the agency's conclusory or unsupported suppositions." *McDonnell Douglas Corp. v. U.S. Dep't of the Air Force,* 375 F.3d 1182, 1186–87 (D.C.Cir.2004).

III. ANALYSIS

A. Standing

Defendants argue that Plaintiffs' suit must be dismissed because they lack Article III standing. Defs.' Mot. 13–15. The doctrine of standing reflects Article III's "fundamental limitation" of federal jurisdiction to actual cases and controversies. *Summers v. Earth Island Inst.,* 555 U.S. 488, 493, 129 S.Ct. 1142, 173 L.Ed.2d 1 (2009). The doctrine "requires federal courts to satisfy themselves that 'the plaintiff has alleged such a personal stake in the outcome of the controversy as to warrant his [or her] invocation of federal-court jurisdiction.' " *Id.* (quoting *Warth v. Seldin,* 422 U.S. 490, 498–99, 95 S.Ct. 2197, 45 L.Ed.2d 343 (1975)) (emphasis on "his" in original).

To obtain the injunctive relief they seek, Plaintiffs must show that (1) they have "suffered an 'injury in fact' that is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical; (2) the injury is fairly traceable to the challenged action of the defendant; and (3) it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision." *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs.,* 528 U.S. 167, 180–81, 120 S.Ct. 693, 145 L.Ed.2d 610 (2000); *see also Summers,* 555 U.S. at 493; *Lujan v. Defenders of Wildlife,* 504 U.S. 555, 560, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992); *Shays v. FEC,* 414 F.3d 76, 83 (D.C.Cir.2005). Defendants contend that Plaintiffs have failed to demonstrate that their alleged injury is "imminent" or "traceable." Defs.' Mot. 13. They have not challenged any of the other requirements for standing.

1. Injury in Fact–Imminence

Plaintiffs claim that they are harmed (1) because they are unable to fish for or observe river herring and (2) because, due to the decline of river and Atlantic herring as forage, they are less able to fish for or observe striped bass. Flaherty Decl. ¶¶ 2, 4–5, 12–13; Hastbacka Decl. ¶¶ 6–9, 14–16; Moir Decl. ¶¶ 14, 16–17 [Dkt. No. 17–2]. Defendants argue that the injury associated with striped bass is not actual or imminent because Plaintiffs have failed to assert that they are "*actually* unable to fish for striped bass as a result of NMFS' actions." Defs.' Mot. 13 (emphasis in original).

Defendants are incorrect. Captain Alan Hastbacka has asserted that the fish his clients target, which include striped bass, are "more abundant, bigger, and healthier" when "there are adequate forage fish" and that he can "sell more tackle ... when the fishing is good." Hastbacka Decl. ¶ 6. During at least one fishing season, the fish targeted by Captain Hastbacka and his clients, including striped bass, disappeared when the Atlantic herring stock

 © 2012 Thomson Reuters. No claim to original U.S. Government Works.

in the area was depleted. *Id.* ¶ 9. Michael Flaherty similarly states that "Defendants' failures challenged in this case. negatively impact the health and population levels of the striped bass I fish for." Flaherty Decl. ¶ 12.

*7 In other words, Plaintiffs claim that their ability to fish striped bass for sport or business has been, and will continue to be, harmed by the state of the Atlantic herring fishery because adequate conservation measures to protect the herring upon which striped bass feed have not been adopted. *See, e.g., N.C. Fisheries Ass'n, Inc. v. Gutierrez,* 518 F.Supp.2d 62, 82 (D.D.C.2007) (economic harm "is a canonical example of injury in fact sufficient to establish standing.") (citing *Nat'l Wildlife Fed'n v. Hodel,* 839 F.2d 694, 704 (D.C.Cir.1988)).

Indeed, Defendants themselves have amply made the point that Atlantic herring serve as an important forage species for striped bass and other ocean predators. AR 6111. In its analysis of Amendment 4, the Council stated that its actions "should acknowledge the role that Atlantic herring plays in the Northwest Atlantic ecosystem and address the importance of herring as a forage species for many fish stocks, marine mammals, and seabirds." *Id.* According to the Council, "[o]ne of the objectives of this amendment ... is ... to consider the health of the herring resource and the important role of herring as a forage fish." *Id* . at 6111–12. Hence, there is no doubt that Plaintiffs face imminent harm to their interests in striped bass, should Defendants fail to properly manage Atlantic herring.

Defendants attempt to analogize this case to *FCC v. Branton,* 993 F.2d 906 (D.C.Cir.1993). They argue that, "[a]s in *Branton,* where the plaintiff did not have standing because his injury was based on a possibility that he may someday be exposed to harm, Captain Hastbacka's concern that he may 'someday' be unable to fish for striped bass as a result of the actions that NMFS took in Amendment 4 is patently insufficient to satisfy the 'injury in fact' requirement." Defs.' Mot. 13–14.

Defendants' analysis is not convincing. *Branton* pointed out that "[i]n order to challenge official conduct one must show that one 'has sustained or is immediately in danger of sustaining some direct injury' in fact as a result of that conduct." 993 F.2d at 908 (quoting *Golden v. Zwickler,* 394 U.S. 103, 109, 89 S.Ct. 956, 22 L.Ed.2d 113 (1969)). The plaintiff in *Branton* alleged "that he was injured because he was subjected to indecent language over the airwaves" on one past occasion. *Id.* at 909. Our Court of Appeals held that "a discrete, past injury cannot establish the standing of a complainant ... who seeks neither damages nor other relief for that harm, but instead requests the imposition of a sanction in the hope of influencing another's future behavior." *Id.* The allegation of a single incident of indecent language is obviously very different from the ongoing scenario presented here, where Plaintiffs state that the striped bass which they and their clients fish and observe are now and will in the future be threatened by overfishing of the Atlantic and river herring.

Plaintiffs in this case have alleged continuous and ongoing harm to their ability to fish for species dependant on the Atlantic and river herring. The harm to striped bass stemming from improper regulation of forage fish presents a concrete explanation for how Plaintiffs will be injured by Defendants' actions. *Lujan,* 504 U .S. at 564; *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 81 (in addressing the injury in fact prong, "courts ask simply whether the plaintiff has 'asserted a present or expected injury that is legally cognizable and non-negligible.' ") (quoting *Huddy v. FCC,* 236 F.3d 720, 822 (D.C.Cir.2001)).

2. Traceability

*8 Defendants next argue that Plaintiffs' injuries are not traceable to Amendment 4 because they "occurred long before NMFS issued the final rule implementing Amendment 4" and "because they concern species beyond the scope of the Amendment." Defs. ' Mot. 14.

The first argument is easily disposed of. As explained above, Plaintiffs have stated that they continue to suffer from the depletion of river herring stocks and from the negative impact that depletion of river and Atlantic herring has on striped bass. *See supra* Part III.A.1; Hastbacka ¶¶ 6, 9; Flaherty Decl. ¶ 12. Plaintiffs need demonstrate neither proximate causation nor but-for causation to establish traceability; they must only show that " 'the agency's actions materially increase[d] the probability of injury.' " *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 83 (quoting *Huddy,* 236 F.3d at 722); *see also Nat'l Audubon Soc'y v. Davis,* 307 F.3d 835, 849 (9th Cir.2002) (to be "fairly traceable," chain of causation must be plausible). Again, Defendants themselves have acknowledged the chain of causation between under-regulation of herring fishing and the abundance and health of predator fish. AR 6111–12. Plaintiffs' contention that Defendants' choices in Amendment 4 will materially increase the probability of their injury is far more than merely plausible.

Further, taken to its logical conclusion, Defendants' argument would preclude anyone from challenging FMPs, since the decline of the nation's fisheries began before the MSA was enacted with the purpose of stopping that deterioration. *See* 16 U.S.C. § 1801(b)(1). Therefore, the

fact that the injuries may have begun before issuance of Amendment 4 is no obstacle to Plaintiffs' standing.

Defendants' next argument is no more persuasive. As to river herring, the claim that Plaintiffs' injury cannot be traced to Amendment 4 because Amendment 4 does not address management of river herring is plainly circular when the essence of Plaintiffs' challenge is to Defendants' substantive decision not to include that species. Plaintiffs claim that Defendants' decision not to manage river herring violated the MSA and APA. The harm caused by depletion of river herring by commercial fishing is clearly traceable to Defendants' decision not to restrict river herring catch. Moreover, there is no doubt that increased regulation of river herring catch would contribute to the rebuilding of that stock. *Branton,* 993 F.2d at 910 (traceability and redressability "tend to merge ... in a case such as this where the requested relief consists solely of the reversal or discontinuation of the challenged action.") (citing *Allen v. Wright,* 468 U.S. 737, 759 n. 24, 104 S.Ct. 3315, 82 L.Ed.2d 556 (1984)).

As to striped bass, the fact that Amendment 4 does not specifically regulate striped bass is of no moment. As previously explained, Plaintiffs have articulated a perfectly plausible explanation for how harm to their ability to fish or observe striped bass is traceable to Defendants' claimed deficiencies in regulating herring. *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 83.

***9** In short, Plaintiffs have shown a causal connection between Defendants' regulatory choices in Amendment 4 and the health of river herring and striped bass stocks. Further, Plaintiffs have demonstrated that (1) they have "suffered an 'injury in fact' that is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical; (2) the injury is fairly traceable to the challenged action of the defendant; and (3) it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision." *Friends of the Earth,* 528 U.S. at 180–81. They therefore have standing to challenge Amendment 4.

B. Stocks in the Fishery

Plaintiffs challenge Defendants' decision to approve Amendment 4 because the Amendment includes only Atlantic herring, and excludes river herring, as a stock in the fishery. Once a fish is designated as a "stock in the fishery," the Council must develop conservation and management measures, including ACLs and AMs, for that stock. Pls.' Mot. 14; 16 U.S.C. § 1853(a). Hence, the Atlantic Herring FMP includes no protective measures for river herring.

As described above, the MSA requires the Council to prepare an FMP "for each fishery under its authority that requires conservation and management." 16 U.S.C. § 1852(h)(1). The Act defines a "fishery" as "one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics." *Id.* § 1802(13). A "stock of fish" is "a species, subspecies, geographical grouping, or other category of fish capable of management as a unit." *Id.* § 1802(42). The Council determines which "target stocks" (fish that are deliberately caught), and/or "non-target stocks" (fish that are incidentally caught), to include in the fishery. 50 C.F.R. § 600.310(d)(1).

In other words, in developing an FMP, the Council must decide which species or other categories of fish are capable of management as a unit, and therefore should be included in the fishery and managed together in the plan. This decision entails two basic determinations. The Council must decide (1) which stocks "can be treated as a unit for purposes of conservation and management" and therefore should be considered a "fishery" and (2) which fisheries "require conservation and management." 16 U.S.C. §§ 1802(13), 1852(h)(1). The Council must then set ACLs and AMs for all stocks in the fishery. *Id.* § 1853(a)(15). After the Council completes its proposed plan or amendment, NMFS must review it for compliance with applicable law and standards. *Id.* § 1854(a)(1)(A).

Plaintiffs contend that Amendment 4 contravenes the Act's requirements by failing to include river herring as a stock in the Atlantic herring fishery. Pls.' Mot. 15. Consequently, Plaintiffs argue, Defendants have violated the MSA and APA by erroneously concluding that Amendment 4 comports with the provisions of the MSA. Pls.' Mot. 20; *see also* 16 U.S.C. § 1854(a)(1)(A) (NMFS must determine whether FMPs are consistent with provisions of MSA); *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 71–72 ("Secretarial review of a FMP or plan amendment submitted by a regional council focuses on the proposed action's consistency with the substantive criteria set forth in, and the overall objectives of, the MSA.").

***10** The Court must now consider whether NMFS acted arbitrarily and/or capriciously in approving Amendment 4. 16 U.S.C. § 1855(f)(1); 5 U.S .C. § 706(2). The Court's "task is not to review *de novo* whether the amendment complies with [the MSA's] standards but to determine whether [NMFS's] conclusion that the standards have been satisfied is rational and supported by the record." C & W *Fish,* 931 F.2d at 1562; *see also Blue Ocean Inst. v. Gutierrez,* 585 F.Supp.2d 36, 43 (D.D.C.2008).

Defendants argue that the Administrative Record fully supports their decision and rely on two basic rationales. First, Defendants argue that, because of the imminence of the 2011 statutory deadline for completion of Amendment 4, the decision to postpone consideration of inclusion of river herring in the fishery until development of Amendment 5 was reasonable. Second, Defendants argue that NMFS properly deferred to the Council's determination as to the makeup of the fishery.

1. Delay Due to Statutory Deadline

Defendants first point to the pressure imposed by the MRSA's deadline. Defendants state that, in June 2009, they determined that consideration of measures specifically designed to protect river herring should be delayed so that they could meet the 2011 statutory deadline for providing measures to protect Atlantic herring. Defs.' Mot. 17, 38; see AR 6325–26 ("In June 2009, the Council determined there was not sufficient time to develop and implement all the measures originally contemplated in Amendment 4 by 2011, so it decided that Amendment 4 would only address ACLs and AMs requirements and specification issues."). Defendants' logic was that because time was limited and the MSA required ACL and AM rules for all stocks in the fisheries and Atlantic herring had already been identified as a stock in the fishery, they could best comply with the MSA by formulating only the Atlantic herring regulations and postponing consideration of regulations for the management of river herring. *See* Pub.L. No. 109–479, § 104(b), 120 Stat. 3575, 3584 (requiring that FMPs including processes for setting ACLs and AMs take effect "in fishing year 2011 for all ... fisheries" not determined to be overfished, including the Atlantic herring fishery).

While it is correct that the MRSA did impose the 2011 deadline, Defendants fail to provide any explanation or analysis from which the Court can conclude that the delay in considering the composition of the fishery, which entailed exclusion of river herring, was reasonable. McDonnell Douglas Corp., 375 F.3d at 1186–87 ("we do not defer to the agency's conclusory or unsupported suppositions."). The MSRA was signed at the beginning of 2007. Defendants identify nothing in the Administrative Record that explains why, when the Council had more than four years to meet the statutory deadline for fishing year 2011, it could not address whether river herring, in addition to Atlantic herring, were in need of ACLs and AMs and still meet its deadline.

*11 The Administrative Record discloses only vague and conclusory statements that "there was not sufficient time to develop and implement all the measures originally contemplated in Amendment 4 by 2011." AR 6325; *see also* AR 5641. The closest Defendants come to providing a substantive explanation is to quote a slide from a January 26, 2011, meeting regarding proposed Amendment 5, which reads, "the Herring [Plan Development Team] cannot generate a precise enough estimate of river herring catch on which to base a cap." AR 5361. That document does not explain why an estimate could not have been generated prior to issuance of Amendment 4, nor why the Council could not at the very least have devised an interim Acceptable Biologic Catch control rule based on the best available science, as it did in Amendment 4 for Atlantic herring. Defendants point to no other evidence in the Administrative Record to explain why the Council was unable to address management of river herring in the four years of lead time that elapsed between the signing of the MSRA and the final promulgation of Amendment 4.

The reason that Defendants' failure matters is that the MRSA requires ACLs and AMs for *all* stocks in need of conservation and management, not just for those stocks which were part of the fishery prior to passage of the MRSA. Although the MRSA does not explicitly require the Council to reassess the makeup of the fishery, it does require the Council and NMFS to set ACLs and AMs by 2011 "such that overfishing does not occur in the fishery." 16 U.S.C. § 1853(a)(15). The setting of ACLs and AMs necessarily entails a decision as to which stocks require conservation and management. *Id.* §§ 1802(13), 1853(a)(15). Hence, Defendants must provide some meaningful explanation as to why it was not possible to consider which stocks, other than Atlantic herring, should be subject to the ACLs and AMs which are so central to effective fishery management and avoidance of overfishing. *NetCoalition v. SEC,* 615 F.3d 525, 539 (D.C.Cir.2010) ("an agency may not shirk a statutory responsibility simply because it may be difficult.").

Moreover, Defendants have not explained why the information in the Administrative Record cited by Plaintiffs was deemed insufficient to justify including river herring as a stock, as urged in many comments submitted on the Proposed Regulation, or to permit setting at least an interim Acceptable Biological Catch limit for the species, just as was done for Atlantic herring. *See* Pls.' Mot. 18–19 (citing AR 154, 157, 315, 407, 645, 665, 755, 779, 780, 795, 903, 1257, 1288, 1506, 1978, 2550, 2571, 2602, 2806, 3789, 6341).
In short, Defendants themselves cite to no evidence or facts supporting the Council's excuse that "there was not sufficient time" to consider the fishery's composition. AR 6325; *Kristin Brooks Hope Ctr. v. FCC,* 626 F.3d 586, 588 (D.C.Cir.2010) ("The agency's explanation cannot 'run [ ] counter to the evidence,' ... and it must 'enable us

to conclude that the [agency's action] was the product of reasoned decisionmaking.' ") (quoting Motor Vehicle Mfrs. Ass'n, 463 U.S. at 43, 52).

*12 While a looming statutory deadline may in some instances provide justification for an agency's delay in decision-making, it does not relieve Defendants of the duty to "articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made"—especially when the agency was given a four-year lead time to meet that deadline and failure to meet it could have serious consequences for the species to be protected. Motor Vehicle Mfrs. Ass'n, 463 U.S. at 43 (internal quotation omitted). Defendants' conclusory statement that river herring would simply have to wait until a future amendment does not suffice. Kristin Brooks Hope Ctr., 626 F.3d at 588; McDonnell Douglas Corp., 375 F.3d at 1186–87.

2. Deference to the Council

Defendants also argue that river herring were not designated as a stock in the fishery because the Council decided to include only target stocks in the fishery, and river herring is a non-target stock. Defs.' Mot. 17 (citing AR 6067). According to Defendants, NMFS deferred to the Council's decision not to include any non-target stocks in the fishery, and needed to do no more. AR 6256, 6330. The crux of Defendants' argument is that under both the structure of the MSA and the agency's own regulations, unless a species is determined by NMFS to be "overfished" or the Council's decision is in clear violation of the MSA,5 NMFS should simply defer to the Council's determination of what stocks are in the fishery rather than conduct an independent review of whether that determination complies with the MSA's provisions and standards. Defs.' Mot. 15–16; Defs.' Reply 4–9.

a. Statutory Provisions

Defendants argue that the "Magnuson–Stevens Act entrusts the Councils with the responsibility to prepare FMPs for those fisheries requiring conservation and management" and that the "inclusion of a species ... in a fishery management unit is based on a variety of judgment calls left to the Council." Defs.' Mot. 15. Defendants rely on 16 U.S.C. § 1852(h), giving the Council the responsibility to prepare and submit FMPs and amendments, and on 16 U.S.C. § 1854(e), requiring an FMP only where NMFS has determined that a fishery is "overfished." Therefore, Defendants contend, in the absence of a finding of overfishing, council decisions about the make-up of a fishery are unreviewable by NMFS and are entitled to deference.

Plaintiffs view Defendants' argument as "threaten[ing] to unravel the entire fabric of the Act." Pls.' Mot. 17. They caution that, under the Defendants' interpretation of the MSA, "councils would be left with the sole discretion to include any, or no, stocks in their FMPs, regardless of whether there is scientific information demonstrating the need for their conservation and management." *Id.*

Defendants are correct that "it is the *Council* that has the responsibility to prepare the FMP in the first instance for those fisheries requiring conservation and management," which includes describing the species to be managed. Defs.' Reply 4–5 (citing 16 U .S.C. §§ 1852(h)(1), 1853(a)(2)) (emphasis in original). As explained above, except in special circumstances,6 the council prepares and submits proposed FMPs and amendments to NMFS. 16 U.S.C. § 1852(h)(1).

*13 What Defendants fail to fully appreciate, however, is that once the council completes its work, the MSA requires NMFS to review its plan to determine whether it comports "with the ten national standards, the other provisions of [the Act], and any other applicable law." *Id.* § 1854(a)(1)(A). Thus, it is Defendants' responsibility to decide whether an FMP, including the composition of its fishery, satisfies the goals and language of the MSA. *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 71–72 ("Secretarial review of a FMP or plan amendment submitted by a regional council focuses on the proposed action's consistency with the substantive criteria set forth in, and the overall objectives of, the MSA."). While Defendants are correct that it is the Council's role to name the species to be managed "in the first instance," it is NMFS's role, in the second instance, to ensure that the Council has done its job properly under the MSA and any other applicable law.

It is true that the MSA requires management measures when NMFS finds overfishing. But it certainly does not follow that in the absence of overfishing NMFS may simply rubber stamp the Council's decisions. Section 1854(a) is clear: NMFS must examine whether the FMP "is consistent with the national standards, the other provisions of [the MSA], and any other applicable law." 16 U.S.C. § 1854(a)(1)(A). While NMFS may defer to the Council on policy choices, the Act plainly gives NMFS the final responsibility for ensuring that any FMP is consistent with the MSA's National Standards, and "the overall objectives" of the Act. *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 71–72.

Defendants' responsibilities therefore include ensuring compliance with Section 1852(h)'s requirement that the

Council prepare an FMP or amendment for any stock of fish that "requires conservation and management." 16 U.S.C. § 1852(h)(1). That Section requires FMPs and necessary amendments for all "stocks of fish which can be treated as a unit for purposes of conservation and management" and which are in need of conservation and management. *Id.* §§ 1802(13)(a), 1852(h)(1). Thus, NMFS must make its own assessment of whether the Council's determination as to which stocks can be managed as a unit and require conservation and management is reasonable. Motor Vehicle Mfrs. Ass'n, 463 U.S. at 52 ("agency's explanation ... [must] enable us to conclude that [its decision] was the product of reasoned decisionmaking.").

There is no basis for concluding, as Defendants do, that the structure of the MSA weakens Section 1854's command that NMFS review proposed plans and amendments for compliance with the statute. The standards to be applied in reviewing NMFS's conclusion that Amendment 4 complies with Section 1852(h) are therefore no different than review of NMFS's conclusion that an amendment complies with the National Standards. *See N.C. Fisheries Ass'n,* 518 F.Supp.2d at 71–72 ("Secretarial review of a FMP or plan amendment submitted by a regional council focuses on the proposed action's consistency with the substantive criteria set forth in, and the overall objectives of, the MSA."). Merely deferring to the Council's exclusion of non-target species like river herring without any explanation for why that exclusion complies with the MSA fails to meet APA standards. Motor Vehicle Mfrs. Ass' n, 463 U.S. at 43 (agency must "examine the relevant data and articulate a satisfactory explanation for its action"); *Tourus Records, Inc. v. DEA,* 259 F.3d 731, 737 (D.C.Cir.2001) ("A fundamental requirement of administrative law is that an agency set forth its reasons for decision; an agency's failure to do so constitutes arbitrary and capricious agency action.") (internal quotations omitted).

b. Defendants' Regulation

***14** National Standard 1 of the MSA states, "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the U.S. fishing industry." 16 U.S.C. § 1851(a)(1). Defendants cite to 50 C.F.R. § 600.310(d)(1), which interprets that Standard, and states: "[t]he relevant Council determines which specific target stocks and/or non-target stocks to include in a fishery." According to Defendants, this provision justifies NMFS's failure to explain why the Council's decision comports with the MSA. Defs.' Mot. 15.

However, Section 1854 states in no uncertain language that NMFS must "determine whether [the plan or amendment] is consistent with the national standards, the other provisions of this chapter, and any other applicable law." 16 U.S.C. § 1854(a)(1)(A). A mere regulation can never override a clear Congressional statutory command—i.e., that NMFS shall review FMP amendments for compliance with all provisions of the MSA. *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.,* 467 U.S. 837, 843 n. 9, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984); *Nat'l Ass'n of Clean Air Agencies v. EPA,* 489 F.3d 1221, 1228 (D.C.Cir.2007). Nor, it should be noted, need 50 C.F.R. § 600.310(d)(1) be interpreted as Defendants do. It is absolutely correct that under the MSA, the councils do have the responsibility to determine what stocks to include in the fishery. But that is not the end of the process. After the councils make their determination, NMFS must still make its final compliance review.

Simply put, 50 C.F.R. § 600.310(d)(1) cannot be understood to permit NMFS to ignore its duty to ensure compliance with the MSA. The councils do not have unlimited and unreviewable discretion to determine the make-up of their fisheries.

Therefore, Defendants were required to review Amendment 4 for compliance with the MSA. Defendants need not prove that the decision to designate only target stocks as stocks in the fishery was the best decision, but they must demonstrate that they reasonably and rationally considered whether Amendment 4's definition of the fishery complied with the National Standards and with the MSA's directive that FMPs be generated for any fisheries requiring conservation and management. Mere deference to the Council, with nothing more, does not demonstrate reasoned decision-making. *Motor Vehicle Mfrs. Ass'n,* 463 U.S. at 56 (agency's decision was arbitrary and capricious because it failed to analyze the issue); *Am. Equity Inv. Life Ins. Co. v. SEC,* 613 F.3d 166, 179 (D.C.Cir.2010) (same); *Sierra Club v. U.S. Army Corps of Eng'rs,* 772 F.2d 1043, 1051 (2d Cir.1985) ("agency's action is held to be arbitrary and capricious when it ... utterly fails to analyze an important aspect of the problem.").

C. Bycatch

Plaintiffs also contend that Amendment 4 fails to minimize bycatch, in violation of National Standard 9. 16 U.S.C. § 1851(a)(9). "Bycatch" refers to "fish which are harvested in a fishery, but which are not sold or kept for personal use" including "economic discards and regulatory discards." *Id.* § 1802(2). In other words, fish

incidentally caught in a trawler's net and then later thrown away are bycatch. "In simple terms, bycatch kills fish that would otherwise contribute toward the well-being of the fishery or the nation's seafood consumption needs." *Conservation Law Found. v. Evans,* 209 F.Supp.2d 1, 14 (D.D.C.2001).

***15** The Final Rule implementing Amendment 4 addresses bycatch in one sentence: "[b]y catch in the herring fishery will continue to be addressed and minimized to the extent possible, consistent with other requirements of the MSA." 76 Fed.Reg. 11373, 11374; AR 6326. Plaintiffs argue that this one sentence is insufficient under the MSA, because the Act "requires that all FMPs and FMP amendments contain concrete conservation and management measures to minimize bycatch and bycatch mortality to the extent practicable." Pls.' Mot. 21. Defendants respond that (1) Plaintiffs have waived their claim under National Standard 9 by failing to raise an objection during the administrative process; and (2) the Council and NMFS have sufficiently minimized bycatch based on the best available science. Defs.' Mot. 19–21.

Defendants' first argument is, to put it mildly, hyper-technical, and without merit. Defendants concede that Plaintiffs did comment on bycatch during the administrative process, but only before Defendants issued their second Notice of Intent, limiting Amendment 4's scope to addressing ACLs and AMs for Atlantic herring. Defs.' Reply 10. Nonetheless, Defendants contend that Plaintiffs' failure to raise the issue again, after NMFS announced that Amendment 4 would proceed in its reduced form, bars them from bringing the claim. *Id.* That is, Defendants argue that Plaintiffs waived their bycatch claim by not raising it a *second* time, after Defendants had already made clear that they would not consider bycatch in Amendment 4.

This argument finds no support in caselaw—nor for that matter in fundamental fairness. Certainly it is true "that a party will normally forfeit an opportunity to challenge an agency rulemaking on a ground that was not first presented to the agency for its initial consideration." *Advocates for Highway & Auto Safety v. Fed. Motor Carrier Safety Admin.,* 429 F.3d 1136, 1150 (D.C.Cir.2005). But Defendants cite no authority requiring parties to raise the ground repeatedly after the agency has rejected their suggestion or after each new version of the proposed action is issued.

Moreover, by raising the bycatch issue before Amendment 4 was reduced in scope, Plaintiffs clearly satisfied the purposes of this issue waiver rule. Plaintiffs " 'alert[ed] the agency to [their] position and contentions,' in order to allow the agency to give the issue meaningful consideration." *Dep't of Transp. v. Pub. Citizen,* 541 U.S. 752, 764, 124 S.Ct. 2204, 159 L.Ed.2d 60 (2004) (quoting *Vermont Yankee Nuclear Power Corp. v. NRDC,* 435 U.S. 519, 553, 98 S.Ct. 1197, 55 L.Ed.2d 460 (1978)); *see also Advocates for Highway & Auto Safety,* 429 F.3d at 1150 (the two reasons for an "issue exhaustion" or "issue waiver" rule are that (1) "the role of the court is to determine whether the agency's decision is arbitrary and capricious for want of reasoned decisionmaking" and (2) " '[s]imple fairness ... requires as a general rule that courts should not topple over administrative decisions unless the administrative body ... has erred against objection made at the time appropriate under its practice.' ") (quoting *United States v. L.A. Trucker Lines, Inc.,* 344 U.S. 33, 37, 73 S.Ct. 67, 97 L.Ed. 54 (1952)). Consequently, the Court concludes that Plaintiffs have not waived their claim under National Standard 9.

***16** Defendants' second argument is more substantive. They contend that, in fact, they have satisfied their responsibility to minimize bycatch to the extent practicable.

National Standard 9 requires that "[c]onservation 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." 16 U.S.C. § 1851(a)(9). While each FMP must attempt to minimize bycatch to the extent practicable, it must also "balance competing environmental and economic considerations" as embodied in the ten National Standards. *Ocean Conservancy v. Gutierrez,* 394 F.Supp.2d 147, 157 (D.D.C.2005); *Pacific Coast Fed'n of Fishermen's Ass'n v. Locke,* No. C 10–04790 CRB, 2011 WL 3443533, at *9 (N.D.Cal. Aug.5, 2011). Nonetheless, to meet their responsibility to ensure compliance with the National Standards, Defendants must demonstrate that they have evaluated whether the FMP or amendment minimized bycatch to the extent practicable. *Conservation Law Found.,* 209 F.Supp.2d at 14.

Defendants argue that they have met this burden because the FMP as a whole minimizes bycatch.[7] Defs.' Mot. 20–21. Defendants point to (1) Amendment 1 to the FMP, which "prohibits midwater trawling vessels from fishing in a designated area for Atlantic herring from June 1 to September 30 of each year," (2) the haddock incidental catch cap, which addresses haddock bycatch and was developed through Framework 43 of the Northeast Multispecies FMP,[8] and (3) the limits generally placed on the herring fishery by the interim ABC control rule. *Id.* None of these three examples demonstrate that Defendants undertook any effort to consider whether Amendment 4, or the FMP as amended by Amendment 4,

minimized bycatch to the extent practicable.

The first measure identified by Defendants, Amendment 1, simply bans use of midwater trawling vessels in one of the Atlantic herring fishery's four management areas for four months of the year. 72 Fed.Reg. 11252, 11257 (Mar. 12, 2007). While this rule, issued in March of 2007, does reduce the use of a type of boat that causes substantial bycatch, it does so for only four months per year in only one management area. The second measure, the haddock incidental catch cap, which was issued as part of the Northeast Multispecies FMP, only considers haddock bycatch, and gives no incentive for minimizing bycatch of other species, such as river herring. AR 6153. Finally, the third measure is merely the limits on Atlantic herring catch and in no way limits fishing to minimize river herring or other bycatch. Thus, this measure only has the ancillary benefit of reducing bycatch and bycatch mortality of river herring and other fish by generally limiting the amount of fishing in the Atlantic herring fishery.

The existence of an earlier rule to reduce bycatch and two measures that, at best, have only an incidental effect on bycatch does not show that NMFS ever considered the significant issue of whether the Atlantic Herring FMP minimizes bycatch or bycatch mortality to the extent practicable based on the best available science. 16 U.S.C. §§ 1851(a)(2), (9). While each of these three measures may have some impact on total bycatch in the Atlantic herring fishery, none of them indicate that Defendants have considered the issue in any substantive manner.

***17** Defendants also quote from two sections of Amendment 4 that discuss bycatch. First, Defendants point to the section of the Council's substantive analysis of Amendment 4 that ostensibly discusses National Standard 9. Defs.' Mot. 20–21. This single paragraph explains that "the Council made the decision to include only [Atlantic] herring as a stock with the knowledge that other mechanisms exist to deal with non-targets [sic] species caught," and "one of the objectives of Amendment 5 to the Atlantic Herring FMP, which is under development, is to develop a program which effectively and efficiently monitors bycatch and potentially acts to reduce it." AR 6087. "The amendment therefore specifies that bycatch is to be monitored and minimized accordingly."[9] *Id.* If anything, this statement makes it clear that neither the Council nor NMFS made any effort to consider whether bycatch was minimized to the extent practicable. 16 U.S.C. § 1851(a)(9).

Second, Defendants point to the section of their analysis of the "Environmental Impacts of Management Alternatives" dealing with the "Impacts on Non-target Bycatch Species." AR 6193–95. Defendants quote: "Amendment 4 'limit [s] the catch of non-target/bycatch species, particularly through the limit to the fishery placed by the interim ABC control rule.' " Defs.' Mot. 20–21 (quoting AR 6193). In context, all that the document actually says is that, because of Amendment 4's interim limits on the total catch allowed for Atlantic herring, there will be less incidental catch of non-target species than under "the no action alternative." AR 6193–94. Again, this conclusion does not reflect any examination or consideration of whether the FMP, as amended, actually minimizes bycatch to the extent practicable. 16 U.S.C. § 1851(a)(9).

Finally, Defendants state that they chose to defer consideration of National Standard 9 due to the 2011 statutory deadline for Amendment 4. Defs.' Mot. 21. For the reasons discussed at length above, *supra* Part III.B.1., this rationale does not suffice to demonstrate reasoned analysis of the bycatch issue. In sum, there is no evidence that the agency "thoroughly reviewed the relevant scientific data on bycatch and consulted with participants in the fishery to determine whether the proposed regulations would be effective and practical," as they must do to satisfy their responsibilities to ensure compliance with the National Standards. *Ocean Conservancy,* 394 F.Supp.2d at 159; *Conservation Law Found.,* 209 F.Supp.2d at 14. Therefore, Defendants' approval of Amendment 4, without addressing the minimization of bycatch to the extent practicable, was in violation of the MSA and APA.

D. ACLs for Atlantic Herring

Plaintiffs claim that Amendment 4's annual catch limit ("ACL")[10] for Atlantic herring violates the MSA because it fails to prevent overfishing and is not based upon the best available science. 16 U.S.C. §§ 1851(a)(1), (2). As detailed above, the MRSA significantly enlarged the Council's and NMFS's duties by requiring all FMPs to include "a mechanism for specifying annual catch limits ... at a level such that overfishing does not occur in the fishery." *Id.* § 1853(a)(15). The new ACLs are to set specific limits on the total fish caught in each fishery.

***18** The setting of an ACL entails a rather laborious process intended to generate a scientific basis for the final catch limit. First, the Council must define an overfishing limit ("OFL"), which, to simplify, is an estimate of the rate of fishing at which a fishery will not be sustainable.[11] 50 C.F.R. §§ 600.310(e)(1)(i)(A)-(2)(i)(E).

Second, the Council must determine the acceptable biological catch ("ABC"), which is the amount of fish that

may be caught without exceeding the overfishing limit, after taking into account scientific uncertainty. *Id.* § 600.310(f)(2)(ii). In order to set the ABC, the Council must first establish an "ABC control rule," which explains how the Council will account for scientific uncertainty when setting the ABC. 50 C.F.R. § 600.310(f)(4). The objective of the ABC control rule is to create a buffer between OFL and ABC so that there is a low risk that OFL will be exceeded. *See id.* §§ 600.310(b)(v)(3), (f)(4).

Third, and finally, the Council must set the ACL, which is the amount of fish that may be caught without exceeding the ABC, after taking into account management uncertainty, such as late reporting, misreporting, and underreporting of catch.12 *Id.* § 600.310(f)(1). In mathematical terms, the entire process can be described as OFL≥ABC≥ACL. AR 6061. In plain English, the ABC must be equal to or less than OFL, to account for scientific uncertainty, and the final ACL must be equal to or less than ABC, to take into account management uncertainty. 50 C.F.R. §§ 600.310(e)-(f).

Further, each council must establish a scientific and statistical committee ("SSC"), whose members must include Federal and State employees, academicians, or independent experts with "strong scientific or technical credentials and experience." 16 U.S.C. §§ 1852(g)(1)(A), (C). The SSC provides "ongoing scientific advice" for fishery management decisions, including the setting of ABC and OFL. *Id.* § 1852(g)(1)(B). In particular, the Council must create its ABC control rule based on scientific advice from the SSC. 50 C.F.R. § 600.310(f)(4). Additionally, ACLs "may not exceed the fishing level recommendations" of the Council's SSC. 16 U.S.C. § 1852(h)(6). To summarize, in the process of setting the final ACL, the council must solicit scientific advice from the SSC and, based on that advice, establish a rule for acceptable biological catch to account for scientific uncertainty, and then set an ACL that permits no greater fishing levels than the SSC recommends.

Finally, ACLs must, of course, be consistent with the National Standards. *Id.* § 1853(a)(1)(C). Plaintiffs argue that the Atlantic herring ACL fails to comply with National Standards 1 and 2. National Standard 1 requires that "[c]onservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry." *Id.* § 1851(a)(1). Hence, they argue, NMFS's conclusion that the Atlantic herring ACL prevents overfishing while achieving optimum yield must be "rational and supported by the record." *C & W Fish,* 931 F.2d at 1562; *Blue Ocean Inst.,* 585 F.Supp.2d at 43.

***19** National Standard 2 instructs, "[c]onservation and management measures shall be based upon the best scientific information available." *Id.* § 1851(a)(2). National Standard 2 "requires that rules issued by the NMFS be based on a thorough review of all the relevant information available at the time the decision was made ... and insures that the NMFS does not 'disregard superior data' in reaching its conclusions." *Ocean Conservancy,* 394 F.Supp.2d at 157 (quoting *Building Indus. Ass'n v. Norton,* 247 F.3d 1241, 1246–47 (D.C.Cir.2001)).

This rule "is a practical standard requiring only that fishery regulations be diligently researched and based on sound science." *Ocean Conservancy,* 394 F.Supp.2d at 157. Further, "[c]ourts give a high degree of deference to agency actions based on an evaluation of complex scientific data within the agency's technical expertise." *Am. Oceans Compaign v. Daley,* 183 F.Supp.2d 1, 4 (D.D.C.2000) (citing *Baltimore Gas & Elec. Co. v. NRDC,* 462 U.S. 87, 103, 103 S.Ct. 2246, 76 L.Ed.2d 437 (1983)). Therefore, "[l]egal challenges to the Secretary's compliance with National Standard 2 are frequent and frequently unsuccessful" and Plaintiffs face a "high hurdle." *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85.

Amendment 4's ABC control rule, which is intended to account for scientific uncertainty, sets the ABC for Atlantic herring at the three-year average annual catch measured from 2006–2008, or at 106,000 metric tons ("mt"). AR 6068–69. In other words, the ACL for Atlantic herring will be equivalent to the average yearly catch from 2006 to 2008, minus a buffer for management uncertainty. Plaintiffs argue that this ABC control rule violates National Standards 1 and 2. Plaintiffs claim that using this three-year average, without any further discount to reflect scientific uncertainty, will not prevent overfishing and is not based on the best available science.13 Pls.' Mot. 22–27.

To the contrary, the Administrative Record demonstrates that the Council properly considered the advice of its SSC and, after review of the best scientific information then available, selected an ABC control rule. The Administrative Record indicates that the SSC identified "considerable scientific uncertainty" in attempting to assess the size of the Atlantic herring stock, and therefore "recommended that the ABC be set based on recent catch, and asked the Council [to] determine the desired risk tolerance in setting the ABC." AR 6068. In accordance with the SSC's advice, the Council considered three options for defining recent catch: (1) the most recent, available single-year catch figure of 90,000 mt in 2008; (2) the most recent, available three-year annual average of 106,000 mt from 2006–2008; and (3) the most recent, available five-year annual average of 108,000 mt from 2004–2008. *Id.*

The Council ultimately decided to use the three-year catch figure to estimate ABC, based on four rationales. First, a three-year average is commonly used to estimate "recent" trends in a fishery. *Id.* Second, the 2008 catch "was one of the lowest on record for many years" and using the one-year estimate may fail to account for general variability in annual catch. *Id.* Third, because the three-year average is lower than the five-year average, it provides a more conservative estimate, and is therefore preferable in order to account for other factors, such as "the importance of herring as a forage species." *Id.* Fourth, and finally, the specification of the ABC at 106,000 mt provides a 27% buffer from the maximum sustainable fishing mortality rate of 145,000 mt for 2010, in order to account for scientific uncertainty. *Id.* at 6069.

***20** Plaintiffs point to no evidence that the agency ignored superior or contrary data, as they must to succeed in a National Standard 2 challenge.[14] *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85. Instead, Plaintiffs protest that "Defendants arbitrarily ignored at least two approaches for setting ABC that were scientifically superior." Pls.' Reply 12. First, Plaintiffs claim that Defendants did not adopt an earlier recommendation by the SSC that the ABC control rule include a 40% buffer between OFL and ABC. Second, Plaintiffs state that Defendants refused to accept the approach they identified to set the ABC at 75% of recent average catch. Pls.' Reply 12 (citing AR 3909, 5615). But, as explained above, the Council provided perfectly rational explanations, based on the best available science, for selecting its ABC control rule, which accounted for scientific uncertainty and comported with the SSC's recommendations. AR 6088–89. National Standard 2 demands no more. *Ocean Conservancy,* 394 F.Supp.2d at 157.

Nor, finally, does National Standard 1 provide any independent reason for invalidating the ABC control rule. National Standard 1 requires that "each Council must establish an ABC control rule based on scientific advice from its SSC" and that "[t]he determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock's ABC would result in overfishing." 50 C.F.R. § 600.310(f)(4). The Council considered the advice of its SSC, examined several options for setting the ABC control rule, and made a reasoned determination that using the three-year average catch offered the best approach. The Court must defer to an agency's rational decision when supported by the Administrative Record, as here, and particularly when that decision involves the type of technical expertise relied upon in this case. *Bloch,* 348 F.3d at 1070; *C & W Fish,* 931 F.2d at 1562; *Am. Oceans Compaign,* 183 F.Supp.2d at 4.

Although Plaintiffs may be correct that the Council could have selected a more conservative ABC control rule, which would have resulted in a more conservative ACL, Plaintiffs must do far more than simply show that Defendants did not take their preferred course of action. *See N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85; *Am. Oceans Campaign,* 183 F.Supp.2d at 14 ("the fact that Plaintiffs would have preferred a more detailed analysis does not compel the conclusion that the Secretary's action was arbitrary and capricious."). Plaintiffs must show "some indication that superior or contrary data was available and that the agency ignored such information." *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85. Plaintiffs have made no showing other than that the agency did not select their favored control rule. Therefore, Defendants' adoption of Amendment 4's ABC control rule and resultant ACLs was not arbitrary and/or capricious.

E. AMs for Atlantic Herring

In order to enforce the new ACLs, the amended MSA requires all FMPs to include "measures to ensure accountability." 16 U.S.C. § 1853(a)(15). "AMs are management controls to prevent ACLs ... from being exceeded, and to correct or mitigate overages of the ACL if they occur." 50 C.F.R. § 600.310(g)(1). Therefore, whenever possible, FMPs should include AMs "to prevent catch from exceeding ACLs" and "when an ACL is exceeded ... as soon as possible to correct the operational issue that caused the ACL overage, as well as any biological consequences to the stock or stock complex resulting from the overage." *Id.* §§ 600.310(g)(2), (3).

***21** Just like ACLs, AMs must satisfy the National Standards, including National Standard 2. As explained at greater length above, National Standard 2 "is a practical standard requiring only that fishery regulations be diligently researched and based on sound science." *Ocean Conservancy,* 394 F.Supp.2d at 157. And of course, "[c]ourts give a high degree of deference to agency actions based on an evaluation of complex scientific data within the agency's technical expertise." *Am. Oceans Compaign,* 183 F.Supp.2d at 4.

Plaintiffs argue that Amendment 4's AMs are deficient for two reasons. First, Plaintiffs claim that the existing monitoring system used to detect when ACLs are reached, is insufficient. Pls.' Mot. 28–31. Second, Plaintiffs contend that the actual group of AMs included in the Atlantic herring FMP "are fundamentally flawed and insufficient to minimize the frequency and magnitude of catch in excess of the ACLs for Atlantic herring." *Id.* at 31–33. Each claim is considered in turn.

1. Monitoring System

Currently, owners or operators of vessels with permits to fish for Atlantic herring are required to make a weekly report of herring they catch through an "Interactive Voice Response" ("IVR") system. 50 C.F.R. § 648.7(b)(2)(I). The reports are verified by comparing them to weekly dealer data. AR 6255. According to Defendants, "there is an incentive for fishermen to report catch accurately" "[b]ecause payment for catch is often tied to vessel/dealer reports." Defs.' Reply 17. Additionally, federal observers on board fishing boats monitor bycatch. Pls.' Mot. 9; Defs .' Reply 17. Between 2005 and 2007, the annual percentage of trips observed ranged from 8% to 26%, for an annual average of 16%.[15] AR 653.

Plaintiffs argue that this monitoring system violates the MSA because "[a]ccurate catch limits are impossible at present in the Atlantic herring fishery because monitoring in the fishery is based heavily on unverified reports of catch and landings." Pls.' Mot. 30. Further, "accurate estimates cannot be accomplished because even on trips where a federal observer is on board the vessel, vessels are not required to bring all catch onboard [sic] for sampling and inspection" and "the ability to extrapolate catch and bycatch up to fleetwide estimates is impossible because there are insufficient observer coverage levels and at-sea dumping of unsampled catch occurs, even on otherwise observed trips." *Id.*

However, Plaintiffs offer no evidence to demonstrate "some indication that superior or contrary data was available and that the agency ignored such information." *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85; *Ocean Conservancy,* 394 F.Supp.2d at 157 (National Standard 2 requires "only that fishery regulations be diligently researched and based on sound science."). Indeed, Plaintiffs again cite no evidence in the Administrative Record to support their claims that "accurate catch limits are impossible," that "accurate estimates cannot be accomplished," or that "the ability to extrapolate catch and bycatch up to fleetwide estimates is impossible." Pls.' Mot. 30.

*22 Rather than cite to evidence that the Council or NMFS disregarded the best available science, Plaintiffs advance two legal arguments. First, Plaintiffs claim that Defendants have admitted that the current monitoring system is inadequate. Pls.' Mot. 17. But the Administrative Record citations provided by Plaintiffs say no such thing. All that they do say is that the Council was considering measures "to improve catch monitoring." AR 5587; *see also* AR 380–83, 2883, 2886. The statement that monitoring could, potentially, be improved, certainly does not amount to a concession that the current system is legally insufficient. Nor, it should be pointed out, would it benefit the notice and comment process if an agency were unable to consider possible policy improvements for fear that even soliciting comments would be considered an admission that current policies are legally inadequate.

Second, Plaintiffs claim that "vessel catch reports have been found time and again to be unreliable," citing a decision by this Court. Pls.' Reply 17. However, *Conservation Law Foundation,* the case cited by Plaintiffs, merely observed that the defendants in that case *conceded* that there were problems with their bycatch monitoring and that the New England Council's Multispecies Monitoring Committee concluded that commercial fishers unlawfully underreport bycatch. 209 F.Supp.2d at 13, 13 n. 25. Certainly, the conclusion of a different council committee, based on a separate factual record in a separate fishery, does not preclude this Council from concluding that observer coverage constitutes one of several sufficient monitoring mechanisms.

The Administrative Record contains evidence that Defendants did in fact consider Plaintiffs' comments and determined that the current monitoring system is sufficient. AR 6255, 6328. Specifically, in her "Decision Memorandum," NMFS's Regional Administrator Patricia A. Kurkul stated that, after considering comments expressing concerns regarding the monitoring, she "conclude[d] that current reporting and monitoring is sufficient to monitor catch against ACLs/sub–ACLs." *Id.* at 6255. She explained that herring quotas can be monitored by weekly reports with verification by comparison to dealer reports, and stated that the agency would continue to develop improvements to the reporting system in Amendment 5. *Id.* While NMFS may not have performed an in-depth analysis, it reasonably relied on a policy that has been in place since 2004 and which underwent its own notice and comment process before being adopted. *See* 69 Fed.Reg. 13482 (Mar. 23, 2004).

Most importantly, though, Plaintiffs provide no evidence—in this case—that this longstanding monitoring system, while far from perfect, was not "diligently researched and based on sound science." *Ocean Conservancy,* 394 F.Supp.2d at 157; *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85. While there are serious concerns about the efficacy of the current monitoring system, see AR 651, the Court must nonetheless afford "a high degree of deference to agency actions based on an evaluation of complex scientific data." *Am. Oceans Compaign v. Daley,* 183 F.Supp.2d at 4. Therefore, Plaintiffs have not demonstrated that Defendants' approval of Amendment 4's monitoring system was arbitrary and/or capricious.

2. Specific Accountability Measures

*23 Amendment 4 designates three management measures—two measures which were previously in place and one new policy—as AMs for the Atlantic herring fishery. AR 6327; 50 C.F.R. § 648.201(a). The first AM is a management area closure device intended to prevent ACL overages. This AM prohibits vessels from catching more than 2000 lbs of Atlantic herring per day once NMFS has determined that catch will reach 95% of the annual catch allocated to the given management area. 50 C.F.R. § 648.201(a)(1). The second AM, known as the haddock incidental catch cap, attempts to prevent ACL overages by limiting Atlantic herring catch to 2000 lbs per day once NMFS has determined that the limit on incidental haddock catch has been reached. *Id.* § 648.201(a)(2). The third, and final, AM aims to mitigate ACL overages by deducting the amount of any overage from the relevant ACL or sub-ACL for the fishing year following NMFS's determination of the overage. *Id.* § 648.201(a)(3). Plaintiffs argue that each of these AMs is fundamentally flawed. Pls.' Mot. 31–33.

a. Management Area Closure

Plaintiffs criticize the management area closure measure because it has not always prevented ACL overages in the past. *Id.* at 31. Plaintiffs claim that the measure "has already proven to be ineffective," id., and that "Defendants acknowledge that [it] has already failed to work." Pls.' Reply 18. Plaintiffs erroneously characterize a more nuanced response from Defendants as a significant concession. What the Administrative Record actually demonstrates is that NMFS recognized that in 2010, a particular management area experienced an overage of 138% of its quota, but that "[w]hen there is a pulse of fishing effort on a relatively small amount of unharvested quota ... the chance of quota overage exists, regardless of reporting or monitoring tools."[16] AR 6328; Defs.' Mot. 28. Indeed, the Council considered this issue and concluded that, "[w]hile some overages have been experienced, the frequency and degree of overage has not been significant enough to compromise the health of the resource complex as a whole." AR 6077.

Plaintiffs nonetheless argue that the management area closure measure violates the MSA because it permits some overages despite MSA's requirements (1) that ACLs be set at levels to prevent overfishing and (2) that AMs prevent catch from exceeding ACLs. Pls.' Reply 18–19 (citing 16 U.S.C. § 1853(a)(15); 50 C.F.R. § 600.310(g)(2)).[17] This argument is unconvincing.

First, the existence of an ACL overage does not mean that overfishing is occurring. *See* 16 U.S.C. § 1802(34) (defining overfishing as "a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis."). In other words, an overage does not necessarily establish that the capacity of a fishery to produce the maximum sustainable yield on a continuing basis is being jeopardized. Indeed, the entire purpose of the process by which ACLs are generated is to create an effective buffer between ACLs and overfishing limits. *See supra* Part III.D.

24 Second, the National Standard 1 guidelines cited by Plaintiffs do not, as Plaintiffs claim, state that "NMFS must 'prevent catch from exceeding ACLs.' " Pls.' Reply 19 (quoting 50 C.F.R. § 600.310(g)(2)). The full text of that provision reads, "[w]henever possible,* FMPs should include inseason monitoring and management measures to prevent catch from exceeding ACLs." 50 C .F.R. § 600.310(g)(2) (emphasis added). Indeed, these guidelines specifically require AMs that can correct ACL overages when they occur. *Id.* § 600.310(g)(3). Such AMs would hardly be necessary if NMFS was under an obligation to guarantee that overages never occur. In sum, Plaintiffs have not demonstrated that the one example of an admittedly very high overage in 2010 demonstrates that the use of the management area closure AM is fundamentally flawed.

b. Haddock Incidental Catch Cap

Plaintiffs argue that because the haddock incidental catch cap "is an accountability measure for haddock, which is managed in the Northeast Multispecies FMP," it "is irrelevant as an accountability measure for the Atlantic herring ACL." Pls.' Mot. 31. Defendants respond that, even though the cap only covers incidental catch of haddock, it "is likely to have real benefits to the herring stock" and that "[a]ccountability measures are management tools that work together to help prevent a fishery from exceeding its ACL." Defs.' Mot. 28–29. Simply put, Plaintiffs argue that only measures designed to enforce ACLs or mitigate ACL overage can be considered AMs, while Defendants claim that any measure that might have the effect of reducing catch, and thereby helping to keep it at a level within an ACL, can constitute an AM.

Plaintiffs have the better of this argument. The statute requires, in unambiguous language, that FMPs include "measures to ensure accountability" with "annual catch limits." 16 U.S.C. § 1853(a)(15). "Accountability" means "the quality or state of being accountable, liable, or responsible." Webster's Third New International

Dictionary 13 (1993). The management area closure measure discussed above clearly fits this definition: it holds fishermen and women accountable for abiding by Atlantic herring ACLs by restricting the amount of fish they catch when they get close to the limit on Atlantic herring. The haddock catch cap has no such effect. It merely holds fishermen and women accountable for incidentally catching too much haddock by limiting their ability to fish when the cap is reached. Fishermen and women may far exceed any Atlantic herring ACL and still happily fish for herring so far as the incidental haddock catch cap is concerned, as long as they have not accidentally caught too much haddock.

Hence, standing alone, the haddock incidental catch cap does not fulfill the MSA's demand that FMPs include measures to ensure accountability for ACLs. 16 U.S.C. § 1853(a)(15). Nonetheless, it should be noted that nothing prevents NMFS or the Council from considering the effect of the haddock incidental catch cap when determining whether the FMP's AMs satisfy the MSA by, *inter alia,* ensuring accountability with ACLs and preventing overfishing. *Id.* §§ 1851(a), 1853(a)(15); see *also* 50 C.F.R. § 600.310(g).

c. Overage Deduction

***25** The overage deduction AM is intended to satisfy Defendants' responsiblity, when an ACL is exceeded, "as soon as possible to correct the operational issue that caused the ACL overage, as well as any biological consequences to the stock or stock complex resulting from the overage when it is known." 50 C.F.R. § 600.310(g)(3). The overage deduction AM provides that any overage in a given year is subtracted from a subsequent year's ACL or subACL, so that violating catch limits in one year lowers the permissible catch in a future year. 50 C.F.R. § 648.201(a)(3). The logic of this AM is simple: the effects of catching too much fish will be corrected by reducing the amount of fish caught in the future.

Plaintiffs argue that this AM violates the mandate to correct ACL overages "as soon as possible" because the overage deduction is taken not in the fishing year immediately following the overage, but rather in the year after. Pls.' Mot. 32; AR 6327. Defendants contend that "[i]t is not possible to require payback of overages in the next year because the final data is not available immediately ." Defs.' Mot. 29.
The issue presented is whether the decision that a year-long delay is necessary was "rational and supported by the record," C & W *Fish,* 931 F.2d at 1562, and was "diligently researched and based on sound science." *Ocean Conservancy,* 394 F.Supp.2d at 157. In response to concerns over the delay, NMFS explained that "[t]he herring fishing year extends from January to December." AR 6328. Because the "fishery can be active in December," "information on bycatch of herring in other fisheries is not finalized until the spring of the following year," and NMFS must "provide sufficient notice to the industry," the overage deduction cannot be taken in the year immediately following the year of the overage. *Id.* That is, Defendants just do not have all the necessary information nor the necessary time to calculate overages when one fishing year ends in December and the next begins in January.[18]

In addressing the issue, the Council and NMFS did consider the impact of the delay on the fishery. The Final Rule explains that "[h]erring is a relatively long-lived species (over 10 years) and multiple year classes are harvested by the fishery." *Id.* "These characteristics suggest that the herring stock may be robust to a single year delay in overage deductions." *Id.* More importantly, "[t]here is no evidence that a single year delay is more likely to affect the reproductive potential of the stock than an overage deduction in the year immediately following the overage." *Id.*

Plaintiffs do not offer any evidence that the necessary calculations for the Herring fishery can be completed in time to avoid the delay in overage deduction, nor do they offer "some indication that superior or contrary data was available and that the agency ignored such information." *N.C. Fisheries Ass'n,* 518 F.Supp.2d at 85. Instead, Plaintiffs assert that "corrective measures in the fishery are not routinely delayed," Pls.' Mot. 32, and that Defendants "have implemented next-year overage deductions in other fisheries." Pls.' Reply 20. These claims are not enough to show that Defendants' analysis of the needs of *this* fishery, as outlined above, were unreasonable or based on unreliable information. *Bloch,* 348 F.3d at 1070; *C & W Fish,* 931 F.2d at 1562; *Ocean Conservancy,* 394 F.Supp.2d at 157.

***26** In sum, Amendment 4 includes two AMs, supplemented by the haddock incidental catch cap, designed to prevent ACL overages and to correct overages when they occur. 50 C.F.R. § 600.310(g). While Plaintiffs have identified what they perceive to be weaknesses with the AMs, they have failed to offer evidence that undermines Defendants' own showing of a reasonable decisionmaking process or that demonstrates Defendants' rejection of superior information. Particularly in light of the need for deference in this technical and complex area, the Court must defer to Defendants' conclusion that Amendment 4's AMs satisfy the requirements of the MSA. Am. *Oceans Campaign,* 183

F.Supp.2d at 14.

F. Compliance with NEPA

Finally, Plaintiffs argue that Defendants' Environmental Assessment ("EA") and Finding of No Significant Impact ("FONSI") violate NEPA. NEPA's requirements are "procedural," calling upon "agencies to imbue their decisionmaking, through the use of certain procedures, with our country's commitment to environmental salubrity ." *Citizens Against Burlington, Inc. v. Busey,* 938 F.2d 190, 193–94 (D.C.Cir.1991). "NEPA does not mandate particular consequences." *Id.* at 194.

Under NEPA, agencies must prepare an EIS for "major Federal actions significantly affecting the quality of the human environment ." 42 U.S.C. § 4332(2)(C). In an EIS, the agency must "take a 'hard look' at the environmental consequences before taking a major action." *Baltimore Gas & Elec. Co.,* 462 U.S. at 97 (1983) (citations omitted).

However, NEPA provides agencies with a less burdensome alternative—in certain situations, an EA, which is a less thorough report, may suffice. *Monsanto Co. v. Geerston Seed Farms,* —— U.S. ——, ——, 130 S.Ct. 2743, 2750, 177 L.Ed.2d 461 (2010) (citing 40 C.F.R. §§ 1508.9(a), 1508.13). An EA is a "concise public document" that "[b]riefly provide[s] sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." 40 C.F.R. § 1508.9(a).19 After completion of an EA, an agency may conclude that no EIS is necessary. If so, it must issue a FONSI, stating the reasons why the proposed action will not have a significant impact on the environment. *Id.* § 1501.4(e).

In reviewing an EA or FONSI, courts consider four factors. Courts must determine whether the agency:

> "(1) has accurately identified the relevant environmental concern, (2) has taken a hard look at the problem in preparing its [FONSI or Environmental Assessment], (3) is able to make a convincing case for its finding of no significant impact, and (4) has shown that even if there is an impact of true significance, an EIS is unnecessary because changes or safeguards in the project sufficiently reduce the impact to a minimum."

Sierra Club v. Van Antwerp, 661 F.3d 1147, 1154 (D.C.Cir.2011) (quoting *TOMAC v. Norton,* 433 F.3d 852, 861 (D.C.Cir.2006)) (alterations in *Van Antwerp*).

***27** Courts review EAs and FONSIs under the familiar arbitrary or capricious standard of the APA. *Van Antwerp,* 661 F.3d at 1154; *see also Pub. Citizen,* 541 U.S. at 763 ("An agency's decision not to prepare an EIS can be set aside only upon a showing that it was arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."); *Town of Cave Creek, Ariz. v. FAA,* 325 F.3d 320, 327 (D.C.Cir.2003).

Plaintiffs allege a host of deficiencies with Defendants' EA and FONSI. Their claims fall into two categories: (1) Defendants unlawfully segmented their decisionmaking and prejudged the environmental impacts of Amendment 4 to avoid preparing an EIS; and (2) Defendants failed to take a hard look at Amendment 4's environmental consequences.20 Pls. Mot. 34–44.

1. Segmented Decisionmaking & Prejudgment

Plaintiffs advance two arguments that Defendants' EA was procedurally improper. First, Plaintiffs claim that Defendants unlawfully divided certain actions between Amendments 4 and 5 in order to cast Amendment 4 as insignificant and escape the EIS requirement. Pls.' Mot. 38–39. Plaintiffs are correct that " '[a]gencies may not evade their responsibilities under NEPA by artificially dividing a major federal action into smaller components, each without significant impact.' " *Jackson Cnty., N.C. v. FERC,* 589 F.3d 1284, 1290 (D.C.Cir.2009) (quoting *Coal. on Sensible Transp., Inc. v. Dole,* 826 F.2d 60, 68 (D.C.Cir.1987)); *see also* 40 C.F.R. § 1508.25(a)(1) ("Connected actions" are actions that are "closely related and therefore should be discussed in the same impact statement."). However,

> "The rule against segmentation ... is not required to be applied in every situation. To determine the appropriate scope for an EIS, courts have considered such factors as whether the proposed segment (1) has logical termini; (2) has substantial independent utility; (3) does not foreclose the opportunity to consider alternatives, and (4) does not irretrievably commit federal funds for closely related projects."

Jackson Cnty., 589 F.3d at 1290 (quoting *Taxpayers Watchdog, Inc. v. Stanley,* 819 F.2d 294, 298 (D.C.Cir.1987)).

There is no evidence whatsoever in the Administrative

Record that Defendants sought to escape their responsibilities under NEPA "by disingenuously describing [the Atlantic herring FMP] as only an amalgamation of unrelated smaller projects." *Nat'l Wildlife Fed'n v. Appalachian Reg'l Comm'n,* 677 F.2d 883, 890 (D.C.Cir.1981). Although the Court has rejected the basis for NMFS's decision not to consider certain issues before the 2011 statutory deadline, *supra* Part III.B.1., there is no suggestion that NMFS reduced the scope of Amendment 4 to avoid preparing an EIS. Amendment 4 sets out ACLs and AMs for Atlantic herring. Amendment 5 has been proposed to consider, *inter alia,* the composition of the fishery and updated monitoring systems. There is no doubt that Amendment 4 has logical termini, has substantial independent utility, does not foreclose future alternatives, and does not irretrievably commit federal funds for closely related projects. *Jackson Cnty.,* 589 F.3d at 1290.

***28** Second, Plaintiffs argue that Defendants "unlawfully predetermined that only an EA would be necessary for Amendment 4." Pls.' Mot. 40. In this context, "predetermination occurs only when an agency *irreversibly and irretrievably* commits itself to a plan of action that is dependent upon the NEPA environmental analysis producing a certain outcome." *Forest Guardians v. U.S. Fish and Wildlife Serv.,* 611 F.3d 692, 714 (10th Cir.2010) (emphasis in original); *see also Air Transp. Ass'n of Am., Inc. v. Nat'l Mediation Bd.,* 663 F.3d 476, 488 (D.C.Cir.2011) (" 'strong' evidence of 'unalterably closed minds' [is] necessary to justify discovery into the Board's decisionmaking process" on the basis of prejudgment); *C & W Fish,* 931 F.2d at 1565 ("an individual should be disqualified from rulemaking 'only when there has been a clear and convincing showing that the Department member has an unalterably closed mind on matters critical to the disposition of the proceeding.' ") (quoting *Ass'n of Nat'l Advertisers, Inc. v. FTC,* 627 F.2d 1151, 1170 (D.C.Cir.1979)).

Plaintiffs have not met the "high standard to prove predetermination." *Forest Guardians,* 611 F.3d at 714. Plaintiffs' only evidence that Defendants had unalterably closed minds is (1) the statement in the December 17, 2009 memorandum by NMFS's Assistant Regional Administrator for Sustainable Fisheries that "I have determined that, based on our initial review of the proposed subject project and the criteria provided in Sections 5.04 and 6.03 d.2 of NAO 216–6, an environmental assessment is the appropriate level of NEPA review for that project," AR 5639, and (2) the line in the December 28, 2009 Notice of Intent, announcing the narrowed scope of Amendment 4, that "the Council intends to prepare an EA for the action." AR 5641. Neither of these statements rises to the level of irreversibly or irretrievably committing NMFS to a certain course of action. *Forest Guardians,* 611 F.3d at 714. An administrator's statement of an opinion, based upon review of the action's subject matter and relevant regulatory guidance, suggests conscious thought rather than prejudgment, and does not lead to the conclusion that the administrator would not change his or her mind upon review of the full EA.

In sum, Plaintiffs have failed to demonstrate that Defendants unlawfully avoided the responsibility of preparing an EIS by either improperly segmenting their actions or predetermining the outcome of the EA.

2. Hard Look

In order to pass muster under NEPA, Defendants' EA and FONSI must have "taken a hard look at the problem." *Van Antwerp,* 661 F.3d at 1154. Defendants argue that NMFS took a "hard look" at the environmental impact of its action, including the effects on relevant ecosystem components, the Atlantic herring stock, the essential fish habitat, protected species, and non-target/bycatch species, as well as economic and social impacts. Defs.' Mot. 34–35 (citing AR 6032, 6185–201). Plaintiffs do not challenge these arguments. Rather, the thrust of Plaintiffs' argument is that Defendants failed to consider the potential impact of reasonable alternatives. Pls.' Mot. 36, 42–44.

***29** Environmental Assessments must include a "brief discussion ... of alternatives ... [and] of the environmental impacts of the proposed action and alternatives." 40 C.F.R. § 1508.9(b). In considering the analogous requirement for an EIS, our Court of Appeals explained that "the agency's choice of alternatives are ... evaluated in light of [its reasonably identified and defined] objectives; an alternative is properly excluded from consideration in an environmental impact statement only if it would be reasonable for the agency to conclude that the alternative does not 'bring about the ends of the federal action.' " *City of Alexandria, Va. v. Slater,* 198 F.3d 862, 867 (D.C.Cir.1999) (quoting *Citizens Against Burlington,* 938 F.2d at 195). Although an EA generally imposes less stringent requirements on an agency than an EIS, it is clear that an EA's "hard look" must include consideration of reasonable alternatives. *Am. Oceans Campaign,* 183 F.Supp.2d at 19–20; *Citizens Exposing Truth About Casinos v. Norton,* No. CIV A 02–1754 TPJ, 2004 WL 5238116, at *9 (D.D.C. Apr.23, 2004); *Fund for Animals v. Norton,* 281 F.Supp.2d 209, 225 (D.D.C.2003).

Plaintiffs argue that Defendants should have, but failed to

consider the impacts of (1) ACLs and AMs for river herring, (2) potential alternative ABC control rules, (3) potential improvements to the current monitoring system, and (4) alternatives for addressing bycatch. Pls.' Mot. 35–36, 43–44. As to the failure to consider ACLs or AMs for river herring21 or alternatives for addressing bycatch, the Court concludes that, for the reasons stated *supra* Parts III.B–C, Defendants have failed to include a discussion of reasonable alternatives. 40 C.F.R. § 1508.9(b). Defendants have not provided a reasoned explanation for why they could not and did not consider these alternatives, which clearly would "bring about the ends of the federal action," *City of Alexandria,* 198 F.3d at 867 (internal quotation omitted), which were "to bring the FMP into compliance with new [MSA] requirements" by setting ACLs and AMs. AR 6325.

As to alternatives to the ABC control rule and monitoring, Defendants argue that it was reasonable to delay further consideration until Amendment 5.22 Defs.' Mot. 40–41. This response is unsatisfactory. A central function of NEPA's requirements is for the agency to consider environmental impacts "[b]efore approving a project." *City of Alexandria,* 198 F.3d at 866. Therefore, delaying consideration of relevant and reasonable alternatives until a future date violates the "hard look" requirement. 40 C.F.R. § 1508.9(b); *Am. Oceans Campaign,* 183 F.Supp.2d at 19–20; *see also Found. on Econ. Trends v. Heckler,* 756 F.2d 143, 158 (D.C.Cir.1985) ("agency determinations about EIS requirements are supposed to be forward-looking"); *Nat'l Wildlife Fed'n,* 677 F.2d at 889 (" 'the basic function of an EIS is to serve as a forward-looking instrument to assist in evaluating proposals for major federal action' ") (quoting *Aersten v. Landrieu,* 637 F.2d 12, 19 (1st Cir.1980)).

***30** More importantly, Defendants' EA demonstrates a total failure to consider the environmental impacts of alternatives to the proposed ABC control rule or AMs. The EA does contain a section entitled "Environmental Impacts of Management Alternatives," but this section only compares the effects of the proposed ACL and AM rules to "no action" alternatives. AR 6037, 6185–95. As the EA itself admits, the "no action" alternative is in fact no alternative at all—taking no action would result in a plain violation of the MSA's ACL and AM requirements.23 16 U.S.C. § 1853(a)(15); AR 6185. Obviously, actions that would violate the MSA cannot be reasonable alternatives to consider. *Am. Oceans Campaign,* 183 F.Supp.2d at 20 (finding failure to consider reasonable alternatives where EAs did "not even consider any alternatives besides the status quo (which would violate the FCMA).").

Equally conspicuous is the fact that while Amendment 4 does contain analysis of rejected alternatives in its substantive sections, there is no related consideration of environmental impacts in its Environmental Assessment. For example, the Council considered alternate ABC control rules, such as use of a one-year or five-year average for defining recent catch, and AMs, such as closure of management areas at a lower percentage of ACL, establishment of a threshold/trigger for an in-season adjustment to ACL, and establishment of a lower trigger for closing the fishery in the following year, to name a few. AR 6083–84, 6088. Tellingly, none of these alternatives receive any treatment in the Environmental Assessment.

In the absence of consideration of alternatives, the Court cannot say that Defendants took a "hard look" at Amendment 4's environmental impacts. 40 C.F.R. § 1508.9(b); *Van Antwerp,* 661 F.3d at 1154; *Am. Oceans Campaign,* 183 F.Supp.2d at 20. Therefore, Defendants' reliance on Amendment 4's EA and resulting FONSI was arbitrary and capricious. *Van Antwerp,* 661 F.3d at 1154; *Pub. Citizen,* 541 U.S. at 763.

G. Remedy

The question of the appropriate remedy in this case presents substantial complexities. Plaintiffs argue that the Court "has the power to design a remedy that both establishes a deadline and directs the Defendants to take specific actions to comply with the law" and that the Court ought to vacate Amendment 4. Pls.' Supp. Mem. 4–5. Defendants argue that Plaintiffs' requests "conflict [ ] with the law of this Circuit" and urge the Court to remand to the agency for further consideration. Defs.' Mot. 42. The question of remedy is further complicated by the fact that many of Amendment 4's deficiencies may be remedied by Amendment 5, which is already under consideration, with a targeted implementation date of January 1, 2013. Defs.' Mot., Ex. 2. At oral argument, the parties requested an opportunity to further brief the remedy issue, should Plaintiffs' prevail in any of their claims. Therefore, the Court will withhold judgment on the question of remedy. The accompanying Order contains a briefing schedule to resolve this issue.

IV. CONCLUSION

***31** For the reasons set forth above, Plaintiffs' Motion for Summary Judgment is **granted in part and denied in part** and Defendants' Motion for Summary Judgment is **granted in part and denied in part.**

An Order will issue with this opinion.

United States District Court,
District of Columbia.

1 Secretary Bryson is substituted for Gary Locke pursuant to Federal Rule of Civil Procedure 25(d).

Civil Action No. 11–660(GK). | March 8, 2012.

2 The Secretary of the Department of Commerce has delegated the authority and stewardship duties of fisheries management under the MSA to NMFS, an agency within the Department. Compl. ¶ 13. On behalf of the Secretary, NMFS reviews FMPs and FMP amendments and issues implementing regulations. *Id.*

3 The Act defines "conservation and management" as:

> all of the rules, regulations, conditions, methods, and other measures (A) which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment; and (B) which are designed to assure that—
> (i) a supply of food and other products may be taken, and that recreational benefits may be obtained, on a continuing basis;
> (ii) irreversible or long-term adverse effects on fishery resources and the marine environment are avoided; and
> (iii) there will be a multiplicity of options available with respect to future uses of these resources.

16 U.S.C. § 1802(5).

4 The MSRA sets an earlier deadline of "fishing year 2010 for fisheries determined by [NMFS] to be subject to overfishing." Pub.L. No. 109–479, § 104(b), 120 Stat. 3575, 3584. The statute defines "overfishing" or "overfished" as "a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis." 16 U.S.C. § 1802(34). NMFS has not determined the Atlantic herring fishery to be overfished.

5 Defendants have not been consistent in explaining what sort of review NMFS must apply to the Council's determination of the composition of a fishery. In their Motion, Defendants concede that NMFS must review FMPs and amendments for consistency with the National Standards and applicable law, but argue that "[t]he inclusion of a species not determined to be overfished in a fishery management unit is based on a variety of judgment calls left to the Council." Defs.' Mot. 15–16. Hence, Defendants appear to be arguing that the Council's decision to exclude a species from a fishery is unreviewable. Later, at oral argument, however, Defendants agreed that the Council's decision must not be arbitrary or capricious.

6 For example, NMFS may develop its own FMP if a council fails to do so within a reasonable time for a fishery in need of conservation and management, or NMFS may order a council to take action to end overfishing and rebuild stocks if it finds that a fishery is overfished or approaching a condition of being overfished. 16 U.S.C. §§ 1854(c)(1), (e).

7 Defendants make much of the distinction that "as a legal matter, the Magnuson–Stevens Act requires that the overall fishery management plan be consistent with National Standard 9–not that each separate *amendment* contain measures to minimize bycatch." Defs .' Mot. 20 (citing 16 U.S.C. § 1851(a)(9)) (emphasis in original). While it may be correct that Amendment 4's compliance with National Standard 9 should be viewed in the context of the entire FMP, it is also clear, as discussed earlier, that NMFS was required to review Amendment 4 "to determine whether it is consistent with the national standards." 16 U.S.C. § 1854(a)(1)(A). Hence, NMFS's review of Amendment 4 had to include some analysis of whether the FMP minimized bycatch "to the extent practicable." *Id.* § 1851(a)(9). As discussed at length below, Defendants have identified nothing in the Administrative Record demonstrating such examination.

8 The haddock incidental catch cap specifies an "incidental haddock catch allowance" for the season for the herring fishery. AR 6153. In simple terms, when a vessel has reached the allowance for incidental haddock catch, it is prohibited from fishing for, possessing, or landing more than 2,000 pounds of herring per trip for the rest of the year. *Id.*

9 The paragraph in full reads:

> National Standard 9 states that bycatch must be minimized and that mortality of such bycatch must be minimized. As such, the Council made the decision to include only herring as a stock with the knowledge that other mechanisms exist to deal with non-targets [sic] species caught by the herring fishery. The amendment therefore specifies that bycatch is to be monitored and minimized accordingly. This amendment also includes the haddock catch cap, being implemented as an AM, which is another way in

> which bycatch is considered and minimized without the haddock stock being defined as a part of the fishery. Furthermore, one of the objectives of Amendment 5 to the Atlantic Herring FMP, which is under development, is to develop a program which effectively and efficiently monitors bycatch and potentially acts to reduce it with collaboration from the fishing industry. The measure maximizes the flexibility provided to the Council so that it can utilize the best scientific information available at the time when the new amendment is implemented. For these reasons the Council decided that until such time that evidence is brought to the Council which indicates that another species needs to be added to the definition of a stock within the herring FMP in order to be managed acceptably, Atlantic herring will be the only defined stock in the fishery.
>
> AR 6087.

10 Amendment 4 permits the Council to establish both an overall ACL for the Atlantic herring fishery, and sub-ACLs for specific management areas. AR 6072–73, 6090.

11 Even this first step entails a number of complex and technical calculations and analyses. For example, in order to determine an OFL, one must, among other things, consider (1) the Maximum Sustainable Yield ("MSY"), defined as "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics ..., and the distribution of catch among fleets," (2) the MSY fishing mortality rate ("Fmsy"), defined as "the fishing mortality rate that, if applied over the long term would result in MSY," and (3) the MSY stock size ("Bmsy"), defined as "the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at Fmsy." 50 C.F.R. § 600.310(e)(1)(i).

12 Again, the Court must emphasize that even this complex explanation, abridged for the purposes of comprehension, omits details of the considerably more complicated process. *See* 50 C.F.R. § 600.310(f).

13 Plaintiffs also object to Defendants' adoption of an "Interim" ABC control rule. Pls.' Mot. 22. Defendants correctly point out that "nothing in the MSA ... *precludes* the use of an interim rule" and, of course, all ABC control rules are interim in the sense that the agency can, and should, revise their rules as superior or more recent information becomes available. Defs.' Mot. 25 (emphasis in original). Perhaps most importantly, the decision to label the rule "interim" with the expectation that the Council can develop a new control rule in the 2013–2015 herring specifications based on a 2012 stock assessment was perfectly rational and supported by the Administrative Record. *C & W Fish,* 931 F.2d at 1562; *see* 76 Fed.Reg. 11373, 13375; AR 6088–89.

14 Plaintiffs claim that Defendants failed "to account for the role of forage in the ecosystem" when setting its ABC control rule. Pls.' Mot. 25–27. However, the Council's analysis of Amendment 4 states that Atlantic herring's role as a forage species was an "Important Consideration" for the SSC and Council when considering the ABC control role and definition of ABC. AR 6051–52, 6054. Indeed, the Council selected the three-year average approach in part because it felt that it best accounted for "other factors identified by the SSC, including recruitment, biomass projections, and the importance of herring as a forage species." *Id.* at 6088.

15 Plaintiffs claim that since the 1990's, "observer coverage has ranged from less than one percent of the total annual fishing trips taken in many years to roughly twenty percent in a handful of years." Pls.' Mot. 9 (citing AR 651, 653, 779). The only citation that supports this claim is a report by the Herring Alliance stating that the coverage rate "has fluctuated from 1 to 17 percent of total fishing trips since the mid–1990s, but are typically between 3 and 6 percent." AR 779. Defendants state that this report, produced by " 'a coalition of environmental organizations that formed ... to protect and restore ocean wildlife ... by reforming the Atlantic herring fishery,' " is not peer-reviewed or approved by NMFS or the Atlantic States Marine Fisheries Commission. Defs.' Mot. 8 n. 6 (quoting www.herringalliance.org/ about-our-work).

> More importantly, the Herring Alliance's estimate is contradicted by the data presented by the Maine Department of Marine Resources and Massachusetts Division of Marine Fisheries. That data demonstrates that 26% of trips were covered in 2005, 14% of trips in 2006, and 8% of trips in 2007, thus supporting Defendants' claim of 16% annual coverage over the three-year period. AR 653.
>
> Plaintiffs also claim that "NMFS has never provided observer coverage levels sufficient to derive accurate catch and bycatch estimates." Pls.' Mot. 9 (citing AR 651, 653). Although one of the slides cited contains a line reading "Low samples [sic] sizes means power to detect low," it is unclear how Plaintiffs concluded

that NMFS has never been able to derive accurate catch and bycatch estimates. AR 651.

16 According to Defendants, there were a total of three management area overages in the four Atlantic herring management areas between 2007 and 2010. Defs.' Reply. 18, 18 n. 20. In addition to the 38% overage Plaintiffs focus on, one management area experienced only a 1% overage in 2009 and another management area experienced only a 5% overage in 2010. Defs.' Reply, Ex. 2.

17 Plaintiffs actually cite to 50 C.F.R. § 600.310(g)(3), but both the language quoted and the relevant substance is contained in § 600.310(g)(2).

18 Defendants also point out in their briefing that "Federal dealer data is not finalized until the spring of the following year and state dealer data is finalized even later," and this data is used in confirming overage calculations. Defs.' Reply 21.

19 Regulations interpreting NEPA's EIS and EA requirements have been promulgated by the Council of Environmental Quality ("CEQ"). *See* 40 C.F.R. § 1500.1 *et seq.* Although "the binding effect of CEQ regulations is far from clear," *TOMAC v. Norton,* 433 F.3d at 861 (D.C.Cir.2006), both agencies and courts have consistently looked to them for guidance. *See, e.g., Sierra Club v. Van Antwerp,* 661 F.3d 1147, 1154–55 (D.C.Cir.2011); *Town of Cave Creek, Ariz. v. FAA,* 325 F.3d 320, 327–332 (D.C.Cir.2003); *Grand Canyon Trust v. FAA,* 290 F.3d 339, 341–42 (D.C.Cir.2002).

20 Because the Court concludes, for the reasons given below, that Defendants' failed to take a "hard look at the problem," *Van Antwerp,* 661 F.3d at 1154, it will not reach the third set of Plaintiffs' NEPA claims, namely that Defendants erroneously concluded that Amendment 4 will not have a significant environmental impact. Plaintiffs argue that Defendants failed to evaluate the cumulative impacts of Amendment 4, as they must when determining significance, and that Defendants' determination that the action had insignificant effects was in error. Pls.' Mot. 34–38, 41–42. Defendants' main response is that Amendment 4's adoption of an ABC control rule and AMs was procedural only, and did not substantively affect the fishery. Defs.' Mot. 39–40. In any case, Defendants will have to reassess this conclusion after taking a 'hard look' at Amendment 4's impacts.

21 Defendants have directed the Court's attention to the decision in *Oceana,* 2011 WL 6357795. Defs.' Notice of Supp. Authority [Dkt. No. 25]. In that case, the court held that NEPA did not require NMFS to consider the composition of the fishery in its EIS. *Id.* at *28–30. However, in *Oceana,* the court focused on the challenged amendment's purpose to implement " 'a broad range of measures designed to achieve mortality targets, provide opportunities to target healthy stocks, mitigate (to the extent possible) the economic impacts of the measures, and improve administration of *the fishery,*' " and concluded that the defendants acted within the scope of the amendment's objectives. *Id.* at *29 (quoting the final amendment) (emphasis in *Oceana*).

In contrast, in this case, Amendment 4's purpose is "to bring the FMP into compliance with new [MSA] requirements" by setting ACLs and AMs. AR 6325; *see also* AR 5640 (purpose of Amendment 4 is "to bring the FMP in compliance with [MSA] requirements to specify annual catch limits (ACLs) and accountability measures (AMs) ."). For the reasons spelled out above, *supra* part III.B, Defendants could not fulfill the purpose of their proposed Amendment 4 to comply with the strict new MSA requirements without giving some reason for their decision to name only Atlantic herring as a stock in the fishery.

22 Defendants also claim that it was proper to delay consideration of a permanent ABC control rule until obtaining "a proper scientific basis." Defs.' Mot. 41. This argument misses the point. Even if setting an "interim" ABC control rule, Defendants could have considered alternative interim ABC control rules. *See* Pls.' Mot. 43.

23 This is another reason that *Oceana* is not applicable to this case. In *Oceana,* the so-called " 'no-action' alternative" actually entailed using the MSY Control Rule as the ABC control, thereby fulfilling the MSA's mandate to set in place a process for establishing ACLs.2011 WL 6357795, at *31–35. By contrast, in this case, in Defendants' own words, "[u]nder the no action alternative no process for setting ACLs would be established" and therefore "the alternative fails to comply with the MSA or NS1 Guidelines." AR 6185. Hence, in *Oceana,* the no action alternative was legally permissible, whereas for Amendment 4 the no action alternative is not a legally viable option.

End of Document

© 2012 Thomson Reuters. No claim to original U.S. Government Works.

Filings (2)

Title	PDF	Court	Date	Type
1. Complaint ror Declaratory and Injunctive Relief Michael S. FLAHERTY, Captain Alan A. Hastbacka, Ocean River Institute, Plaintiffs, v. Gary LOCKE, in his official capacity as Secretary of the Department of Commerce, National Oceanic And Atmospheric Administration, National Marine Fisheries Service, Defendants. 2011 WL 1235745		D.D.C.	Apr. 1, 2011	Pleading
2. Docket 1:11cv00660 FLAHERTY ET AL v. LOCKE ET AL	—	D.D.C.	Apr. 1, 2011	Docket

Atlantic States Marine Fisheries Commission

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

Paul J. Diodati, (MA), Chair *Dr. Louis B. Daniel, III, (NC), Vice-Chair* *John V. O'Shea, Executive Director*

Healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015

RECEIVED
MAY 10 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

May 10, 2012

Daniel S. Morris
Acting Regional Administrator
NMFS, Northeast Regional Office
55 Great Republic Drive
Gloucester, Massachusetts 01930-2276

Dear Mr. Morris,

I am writing on behalf of the Atlantic States Marine Fisheries Commission to comment on Draft Amendment 5 to the Fishery Management Plan for Atlantic Herring (Amendment 5). The Commission held its Spring Meeting last week and developed comments based on the input from the Atlantic Herring Section and Shad and River Herring Management Board. The comments are attached.

Thank you for the opportunity to comment. We look forward to continuing to work with you and the New England Fisheries Management Council on the management of Atlantic herring and river herring.

Sincerely,

John V. O'Shea

Attachments: ASMFC Comments to Draft Amendment 5

cc: Atlantic Herring Section
Shad and River Herring Management Board
Captain Paul Howard – NEFMC

ATLANTIC STATES MARINE FISHERIES COMMISSION COMMENTS ON DRAFT AMENDMENT 5 TO THE FISHERY MANAGEMENT PLAN FOR ATLANTIC HERRING

The Commission recommends that the New England and Mid-Atlantic Fishery Management Councils strive for the highest level of consistency possible in approving the final management measures in Amendments 5 and Draft Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. Where consistency is not possible, the Councils should select measures that will provide the least amount of discord.

3.1 ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM – The Commission is supportive of any measures that will improve accuracy of catch reporting and ensure accounting for all species, including river herring, as well as reduce river herring bycatch where it is occurring. The Commission does not have any specific recommendations on Section 3.1.

3.2 CATCH MONITORING AT SEA

Observer Coverage (Section 3.2.1.2) - The Commission recommends 100% observer coverage. The Commission recommends observer coverage be funded by Federal resources, but that phased-in cost sharing alternatives be considered and the differences in observer costs between the east and west coasts be examined.

Measures to Improve Sampling (Section 3.2.2.1) – The Commission recommends all of the measures (2A - 2F), under Section 3.2.2.1, be adopted to improve sampling by NMFS observers.

States as Service Providers (Section 3.2.1.2.2) – The Commission recommends authorization of all states in the Northeast Region as service providers for sea sampling on limited access Atlantic herring vessels, with state data collection standards and methods being consistent with NEFOP standards and methods for the herring fishery.

Measures to Address Net Slippage (Section 3.2.3)—The Commission supports measures that discourage and reduce net slippage.

3.3 RIVER HERRING BYCATCH

Observer Coverage (Section 3.3.2.2.1) - The Commission recommends 100% observer coverage. The Commission recommends that observer coverage be funded by Federal resources, but that phased-in cost sharing alternatives be considered and the differences in observer costs between the east and west coasts be examined.

Closed Area I Sampling Requirements (Section 3.3.2.2.2) – The Commission supports the Closed Area I Sampling Provisions when fishing in the River Herring Monitoring/Avoidance Areas.

SMAST/DMF/SFC Approach (Section 3.3.2.2.4) – The Commission recommends support of the SMAST/DMF/SFC river herring bycatch avoidance program.

Closed Area and Triggers (Section 3.3.3.2.1 and 3.3.3.2.2) - The Commission does not recommend the use of triggers as a management tool without a method to link the trigger to a peer reviewed biological estimate of coastwide river herring populations. However, if the NEFMC approves the use of closures in the areas/times are identified as River Herring Protection Areas, then these closures should be implemented through a trigger system rather than occurring automatically. The Commission notes the trigger levels presented in Draft Amendment 5 are based on levels of bycatch that have occurred in the past (2005-2009). Using this information in the development of a trigger may only sustain the current level of river herring bycatch, rather than reduce bycatch.

3.4 MID-WATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS – The Commission is supportive of any measures that will improve the accuracy of catch reporting and ensure accounting for all species, including river herring, as well as reduces river herring bycatch where it is occurring. The Commission does not have any specific recommendations on Section 3.4.

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:08 PM
To: Rachel A. Neild
Subject: Fwd: Amendment 5

---------- Forwarded message ----------
From: **Mulcahy, Jeremiah** <jmulcha@entergy.com>
Date: Tue, May 15, 2012 at 10:18 AM
Subject: Amendment 5
To: "heramendment5@noaa.gov" <heramendment5@noaa.gov>

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Capt Jeremiah Mulcahy

F/V Relentless

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:08 PM
To: Rachel A. Neild
Subject: Fwd: Herring Regulation

---------- Forwarded message ----------
From: **john mccormick** <pjmac1@comcast.net>
Date: Mon, May 21, 2012 at 8:54 AM
Subject: Herring Regulation
To: heramendment5@noaa.gov

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

W. John McCormick
3 Blaisdell Road
Westford, MA 01886

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:09 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Draft Amendment

---------- Forwarded message ----------
From: **Timothy Holmes** <timothygholmes@gmail.com>
Date: Tue, May 22, 2012 at 2:00 PM
Subject: Comments on Draft Amendment
To: heramendment5@noaa.gov

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,
Tim Holmes

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:09 PM
To: Rachel A. Neild
Subject: Fwd: NEFMC Herring Amendment 5

---------- Forwarded message ----------
From: **Edward Markert** <kurtmarkert@me.com>
Date: Tue, May 22, 2012 at 11:52 AM
Subject: NEFMC Herring Amendment 5
To: heramendment5@noaa.gov

Dear Sirs,

In regards to environmental Impact Statement (DEIS) for Herring Amendment 5 at a minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Kurt & Michelle Markert

73 Washington Park

Newton, MA 02460

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:09 PM
To: Rachel A. Neild
Subject: Fwd: Herring Amendment 5.

---------- Forwarded message ----------
From: <eldersinboston@msn.com>
Date: Tue, May 22, 2012 at 8:59 AM
Subject: Herring Amendment 5.
To: heramendment5@noaa.gov
Cc: Bob Canzano <bcanzano@me.com>, Kurt Markert <kurtmarkert@me.com>

Dear Sirs,

In regards to environmental Impact Statement (DEIS) for Herring Amendment 5.

As fishermen, we are greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Jim Elder

Jim & Christine Elder
14 Mandalay Rd
Newton, MA 02459

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:06 PM
To: Rachel A. Neild
Subject: Fwd: Fw: Herring Amendment 5, O'Shea

---------- Forwarded message ----------
From: <cvonderweidt@asmfc.org>
Date: Mon, Apr 23, 2012 at 2:15 PM
Subject: Fw: Herring Amendment 5, O'Shea
To: valarry@jetbroadband.com, HerAmendment5@noaa.gov
Cc: KTaylor@asmfc.org, Lori Steele <LSteele@nefmc.org>

Mr. Chewning,

This is a follow up to an email you sent the ASMFC regarding Amendment 5 to the Herring FMP. Amendment 5 was developed by the New England Fishery Management Council and accordingly, they are who you should submit public comment to. The email address for comment is HerAmendment5@noaa.gov

Further information on Amendment 5 can be found at the following websites:
http://nero.noaa.gov/nero/regs/com.html
http://www.nefmc.org/herring/index.html

Best,
Chris

The new contact information is:
****
Christopher M. Vonderweidt
Fisheries Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland St., Suite 200 A-N
Arlington VA, 22201
Phone: (703)-842-0740
Fax: (703)-842-0741
****

From: "VA Larry" <valarry@jetbroadband.com>
To: <info@asmfc.org>
Date: 04/08/2012 08:29 PM
Subject: Herring Amendment 5, O'Shea

Dear: Mr O'Shea

I am a recreational fishermen writing to express my concern about the loss of our river fishing culture and heritage.
This is due in large part to poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring. Populations of these fish have declined by 99 percent in some areas, and are so depleted that they are being considered for protection under the Endangered Species Act.

Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting anyone from catching one for food or bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions for profit by the industrial fishery.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and their agents, communities and individuals throughout the Atlantic invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately report all catch (Section 3.1.5).

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Larry Chewning
1645 Austin Mill Rd
Evington Va 24550
valarry@jetbroadband.com

May 14th, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,
I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.
As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.
At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.
Thanks for your time,

Cody Hallett

236 south st.

Plainville, Ma 02762

508 509 6067

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:07 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Herrring amendments
Attachments: May 14th Herring Comment.docx

---------- Forwarded message ----------
From: **Cody Hallett** <cody-1012@hotmail.com>
Date: Mon, May 14, 2012 at 7:35 AM
Subject: Comments on Herrring amendments
To: heramendment5@noaa.gov

Attached is a file regarding the herring amendments

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:07 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Herrring amendments
Attachments: May 14th Herring Comment.docx

---------- Forwarded message ----------
From: **Cody Hallett** <cody-1012@hotmail.com>
Date: Mon, May 14, 2012 at 7:35 AM
Subject: Comments on Herrring amendments
To: heramendment5@noaa.gov

Attached is a file regarding the herring amendments

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:07 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Herrring amendments
Attachments: May 14th Herring Comment.docx

---------- Forwarded message ----------
From: **Cody Hallett** <cody-1012@hotmail.com>
Date: Mon, May 14, 2012 at 7:35 AM
Subject: Comments on Herrring amendments
To: heramendment5@noaa.gov

Attached is a file regarding the herring amendments

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Wednesday, May 23, 2012 2:07 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Herrring amendments
Attachments: May 14th Herring Comment.docx

---------- Forwarded message ----------
From: **Cody Hallett** <cody-1012@hotmail.com>
Date: Mon, May 14, 2012 at 7:35 AM
Subject: Comments on Herrring amendments
To: heramendment5@noaa.gov

Attached is a file regarding the herring amendments

Conserving Ocean Fish and Their Environment
Since 1973

May 24, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

RE: Amendment 5 to the Atlantic Herring FMP

Dear Mr. Howard,

On behalf of the National Coalition for Marine Conservation (NCMC), I respectfully submit the following recommendations for the New England Council to consider as it selects final alternatives for Amendment 5 to the Fishery Management Plan for Atlantic Herring (Amendment 5). NCMC advocates for management policies that prioritize protecting the ecological role of forage fish in the ecosystem, and we are pleased that the objectives for Amendment 5 recognize that the health of the herring resource and its important role in the food web are to be considered in meeting other plan objectives (see Amendment 5 DEIS, Objective IV, p.14).

Through enhanced catch monitoring and accountability and through minimization of incidental catch and discards, more Atlantic herring, river herring and other forage species will be available for the many predators that need them, benefiting northeast ecosystems as well as New England's commercial and recreational fisheries.

NCMC strongly supports the following as high priority alternatives to meet Amendment 5 objectives:

- **Modified 3.3.5: Implement a river herring and shad catch cap in the Atlantic herring fishery through Amendment 5 to begin in the 2013 fishing year. River Herring Protection Areas (Alternative 3.3.3.2.1) should be implemented as an interim measure if the Council cannot implement the mortality cap for next year.**
- **3.2.1.2 with Funding Option 2: Require 100% observer coverage on limited access Category A & B vessels with supplemental industry funding as needed to achieve the desired coverage level.**

4 Royal Street, SE • Leesburg, VA 20175 • (703) 777-0037 • fax (703) 777-1107
www.savethefish.org

- **3.2.3.4 with Option 4D: Closed Area I provisions with an allowance of 5 slippage events per herring management area after which slippage would result in trip termination.**
- **3.1.5.2: Require dealers to accurately weigh all fish.**
- **3.4.4: Closing the year-round groundfish closed areas to midwater trawl vessels.**

As the timelines for Amendment 5 and the Mid-Atlantic Council's Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan (MSB FMP) have aligned, analyses have shed light on the overlap between the Atlantic herring and Atlantic mackerel trawl fisheries and the need for consistency between the councils' respective FMPs in order to effectively meet goals and objectives (see Amendment 5 DEIS, Table 190, p. 507). Fortunately, the diverse suite of Amendment 5 alternatives offers an opportunity for coordination in several critical areas.

Below we provide recommendations for improving consistency between Amendments 5 and 14 to enhance the effectiveness of their respective management measures, as well as additional information to support the high priority alternatives identified above.

Proposed Adjustments to the Fishery Management Program (Section 3.1)

NCMC supports improving the efficiency, timeliness and accuracy of vessel and dealer reporting so as to improve catch records and the precision of incidental catch estimates, which are extrapolations based on total reported landing. Consistent with our recommendations for Amendment 14, we support the following: (Note: Our comments follow the alternative descriptions and are in *italics*)

- **3.1.4.2: Modifications to the Pre-Trip Notification System (for Observers):** In order to possess, harvest, or land herring, representatives for Category A, B, and C fishing vessels, as well as Category D vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3, must provide notice to NMFS through the pre-trip notification system at least 48 hours prior to beginning the trip.
- **3.1.4.3: Extend Pre-Landing Notification Requirement:** Require limited access herring vessels and herring carrier vessels that opt to use VMS (see Section 3.1.3.2) to notify NMFS Law Enforcement via VMS of the time and place of offloading at least six hours prior to crossing the VMS demarcation line on their return trip to port (or six hours prior to landing if the vessel does not fish seaward of the demarcation line).
- **3.1.5.2: Require Dealers to Accurately Weigh All Fish**
    - **Sub-options 2A and 2B:** Dealers that do not sort by species could document in applications their method for estimating the composition of a mixed catch. If this method cannot be applied to a particular transaction, dealers should be able to apply an appropriate methodology as long as they document that method with the transaction.

We view this set of alternatives as working together to provide for efficiency and flexibility.

- **Sub-option 2C:** This sub-option would require federally permitted Atlantic herring dealers to obtain vessel representative confirmation of SAFIS transaction records to minimize data entry errors at the first point of sale.
-

- **Modified 3.1.6.1: Mackerel Option 1: No Action**

We do not believe sufficient information is presented in the Amendment 5 DEIS to indicate that the current open access limit of 3 metric tons (mt) is promoting discards of Atlantic herring by mackerel vessels in areas 2 and 3 or is preventing mackerel vessels from fishing. We agree with the PDT's concerns that "increased opportunities in these areas should be made with adequate consideration of overall fleet capacity and the long-term effects of overcapacity (Amendment 5 DEIS, p. 358)." Therefore, if the Council moves ahead with either Option 2 or Option 3, we strongly recommend that the increase apply to ***Tier 1 and Tier 2*** *federal limited access mackerel permits ONLY. As indicated in Table 29 (Amendment 5 DEIS, p. 169), approximately 2 mackerel Tier 1 vessels and 26 mackerel Tier 2 vessels hold "D" Atlantic herring permits. If Tier 3 limited access vessels were included, an additional 182 vessels would qualify for the increase.*

Catch Monitoring at Sea (Section 3.2)

NCMC recommends increasing at-sea observer coverage levels, with supplementary industry funding as needed, and enhanced protocols to ensure that observers have access to all catch for sampling in order to improve precision in river herring and shad incidental catch estimates and minimize catch that observers record as "Herring Not Known (NK)" and "Fish Not Known (NK)." We support:

- **3.2.1.2 with Funding Option 2: Require 100% observer coverage on limited access Category A & B vessels with supplemental industry funding as needed to achieve the desired coverage level.**

About thirty A and B vessels are active in the Atlantic herring fishery and account for the vast majority (97-99%) of landings (Amendment 5 DEIS, Table 49, p. 225 and Table 61, p. 238). Over 60% of Category A/B vessels are greater than 80 ft in length (Amendment 5 DEIS, p. 235). Given the high volume nature of these vessels, and the fact that incidental catch events of imperiled river herring and shad can be rare but quite large when they occur, 100% coverage is necessary for an accurate accounting of incidental catch. Because industry funding will be necessary to achieve coverage levels above the status quo, it is important to distribute the observer cost burden equitably among fishery participants, imposing the highest coverage levels on the vessels that derive the most benefit from the Atlantic herring fishery. In 2010, C vessel revenues from herring were $150,000 compared to $18.4 million for A and B vessels (Amendment 5 DEIS, Table 52, p. 231).

We oppose Option 2 under "Provisions for Utilizing Observer Service Providers and Authorizing Waivers." *We note that the Northeast Fisheries Observer Program supports the no action alternative to ensure that state agencies adhere to the same requirements as other service providers.*[1] *Provisions specified in 50 CFR 648.11(h) and (i) are important for maintaining the current high-quality standards for observer hiring and training and for data collection and dissemination, and we oppose exempting states from these requirements.*

- **3.2.2.2 Option 2: Implement Additional Measures to Improve Sampling.**

  We support this suite of measures (2A, 2B, 2C, 2D, 2E and 2F) designed to facilitate and improve sampling by at-sea observers. ***We recommend striking the words "wherever/whenever possible" from alternative 2D as it leaves too much ambiguity regarding the exceptions to this important requirement.*** *The majority of Fish NK records are associated with fish that are pumped to the paired trawl vessel not carrying the observer (Amendment 5 DEIS, p. 418). Between July 2009 and June 2010 over 5.7 million pounds of catch was recorded as Fish NK in the observer database.*[2]

- **3.2.3.4 with Option 4D: Closed Area I provisions with an allowance of 5 slippage events per herring management area after which slippage would result in trip termination.**

  The Council must clarify that "Closed Area I (CA1) provisions" in this alternative are based on the November 30, 2010 Rule (CFR § 648.80) as described in alternative 3.2.3.3 and would apply to operational discards. Of the 929 observed hauls in the herring fishery in 2010, over one-third (332 records) included fish not brought on board for sampling, amounting to over 24,000 lbs of Herring NK and 418,000 lbs of Fish NK recorded by observers (Amendment 5 DEIS, pp. 414- 415). The majority of these records were attributable to operational discards. CA1 regulations, which require operational discards be brought aboard for sampling, have been highly effective with no observed slippage events recorded in 2010 (Amendment 5 DEIS, p. 414). However, the effectiveness of this measure is likely due to an accountability measure tied to the requirements which is that a vessel is required to stop fishing and exit Closed Area I if it releases an un-sampled net. Given the three exceptions provided for under CA1 provisions, permitting 5 slippage events per herring management area before slippage results in trip termination seems to be a reasonable balance that would deter slippage without being unduly penalizing.

Management Measures to Address River Herring Bycatch (Section 3.3)

Lack of consistency between Amendment 5 and Amendment 14 would inhibit the effectiveness of efforts to reduce incidental catch of depleted river herring and shad[3], species

[1] Amendment 5, Volume II, Appendix III

[2] NEFSC. Standardized Bycatch Reporting Methodology Annual Discard Report 201: Section 2, p. 189. http://www.nefsc.noaa.gov/fsb/SBRM/2011/SBRM_Annual_Discard_Rpt_2011_Section2.pdf

[3] [3] The ASMFC lists the status of American shad, alewife and blueback herring as depleted in accordance with the most recent stock assessments for these species.

ASMFC. August 2007. Stock Assessment Report No. 07-01 (Supplement) of the Atlantic States Marine Fisheries Commission: American Shad Stock Assessment for Peer Review, Volume 1.

currently not afforded the protection of required federal conservation and management standards.[4] The Council should take immediate action to add blueback herring, alewife, American shad, and hickory shad to the Atlantic Herring FMP because these stocks are without question involved *in the fishery* and are in need of conservation and management.[5] In the interim, we urge the New England Council to coordinate with the Mid-Atlantic Council to implement an effective joint strategy for reducing incidental catch of river herring and shad from recent levels. The following alternatives should be adopted:

- **Modified 3.3.5: <u>Implement a river herring and shad catch cap in the Atlantic herring fishery through Amendment 5 to begin in the 2013 fishing year. The cap level would be determined through specifications.</u>**

  According to analyses conducted for Amendment 14, the midwater trawl fishery for Atlantic herring and Atlantic mackerel accounts for 71% of combined river herring and shad incidental catch.[6] Amendment 14 incidental cap alternatives discuss a joint cap on the mackerel and herring fleets (i.e., a fleet-area cap) as providing the greatest benefit to river herring and shad.[7]

  Alternative 3.3.5 is tied to the completion of the Atlantic States Marine Fisheries Commission (ASMFC) river herring stock assessment, which has now been peer-reviewed and approved by the ASMFC Shad & River Herring Management Board for management use.[8] Coastwide, river herring populations are depleted to historic lows.[9] While the assessment did not provide reference points for the coastwide river herring complex, it did provide management advice to justify an incidental catch cap. The Peer Review Panel concluded that total mortality levels in all runs examined surpassed the recommended benchmark and called for all sources of mortality to be addressed, <u>including ocean bycatch.</u>[10]

  The fact that immature fish comprise a large portion of at-sea catch was also flagged as a concern by the Peer Review Panel.[11] Of the roughly 5 million river herring taken at sea every year, many are immature. The majority of the 600,000 American shad taken are also juveniles.[12] The "spawn-at-least-once" principle suggests that sustainability is secured if fish become vulnerable to commercial gears only after they have spawned.

ASMFC. May 2012. Stock Assessment Report No. 12-02 of the Atlantic States Marine Fisheries Commission: River Herring Benchmark Stock Assessment, Volume 1.

[4] 16 U.S.C. §§ 1853(a)(2); 1852(h)(1). *See* also *Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 9, 2012).

[5] *See Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 9, 2012), 16 U.S.C. § 1852(h)(1), and 50 C.F.R. § 600.310(d)(1)

[6] MAFMC. Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan including Draft Environmental Impact Statement (Amendment 14 DEIS), Appendix 2, Table 3, p. 581.

[7] MAFMC. Amendment 14 DEIS, p. 162.

[8] ASMFC. Spring 2012 Meeting Summary.

[9] ASMFC. May 2012. Stock Assessment Report No. 12-02 of the Atlantic States Marine Fisheries Commission: River Herring Benchmark Stock Assessment, Volume 1.

[10] Ibid, p. 29

[11] Ibid, pp. 15-16

[12] MAFMC. Amendment 14 DEIS, p. 111.

Research shows that high fishing mortality on immature fish has a significant negative effect on stock status.[13]

American shad stocks are also depleted to historic lows, as referenced in the Amendment 5 DEIS (p. 159). In the 2007 American shad assessment, coast-wide declining trends raised flags that ocean mortality was having a serious impact, and the stock assessment peer review team, noting the limited data on ocean bycatch in particular, listed bycatch monitoring as a high priority for future action.[14] *The Gulf of Maine, where the Atlantic herring fishery operates, is an important summer feeding ground for mixed stock aggregations of American shad.*[15]

A combined river herring and shad (i.e., alosine) fleet/area cap would afford a measure of protection to all alosine species as we seek more precise estimates of incidental catch with increased observer coverage and more robust sampling. *Given the current paucity of data, high CVs around species-specific incidental catch estimates may be problematic.*[16] *As data improve, the Councils could determine through their specifications process if the cap should be further delineated by species. At minimum, an initial alosine catch cap based on recent catch levels would ensure bycatch does not increase as states work to halt declines and rebuild river herring and shad stocks.*

We are opposed to Alternative 3.3.2.2.4 for meeting the goal of reducing incidental river herring/shad catch. *Bycatch avoidance programs are only effective if there is incentive to avoid the bycatch. A similar project employed in the scallop fishery has proven successful at reducing yellowtail flounder bycatch because there is a yellowtail flounder cap that the scallop fishermen must avoid hitting in order to fish; therefore, there is a strong incentive for all fishermen to participate in the effort. The establishment of river herring/shad caps should be a prerequisite for Council support of industry bycatch avoidance tools.*

- **3.3.3.2.1: Closed Areas: Prohibit directed fishing for herring in the area/times that are identified as River Herring Protection Areas, with exemptions for vessels not fishing with fine mesh (with Options for Exemptions, alternative 3.3.3.2.3).**

  We support closing the River Herring Protection Areas as an interim measure until a more robust cap strategy is implemented. *Based on the analyses provided in Amendment 5, Volume II, we believe closing these areas will provide a measure of needed relief to river herring and shad populations in the short-term. However, the distribution of these species is likely too variable for these small closed areas to be effective in the long-term.*[17] ***We oppose the sub-option that would provide a mechanism for limited access herring vessels to declare out of the fishery and avoid***

---

[13] Vasilakopoulos, P., O'Neill, F. G., and Marshall, C. T. 2011. Misspent youth: does catching immature fish affect fisheries sustainability? – ICES Journal of Marine Science, 68: 1525–1534.

[14] ASMFC American Shad Stock Assessment Peer Review Panel. Stock Assessment Report No. 07-01 of the Atlantic States Marine Fisheries Commission, *Terms of Reference & Advisory Report to the American Shad Stock Assessment Peer Review.* Conducted on July 16-20, 2007, Alexandria, Virginia.

[15] ASMFC. January 2009. Atlantic Coast Diadromous Fish Habitat: A Review of Utilization, Threats, Recommendations for Conservation, and Research Needs. ASMFC Habitat Management Series #9. (http://www.asmfc.org/publications/habitat/diadromousSpeciesSourceDocByChapter/HMS9_Diadromous_Habitat_2009.pdf)

[16] MAFMC. Amendment 14 DEIS, Appendix 2, sub Appendix 1, Tables A2 and A3 , pp. 622-627

[17] MAFMC. Amendment 14 DEIS, Appendix 2, pp. 577-578

having to comply with the closed areas. *We believe alternatives 3.3.3.2.1 and 3.3.3.2.3 already provide for appropriate exemptions, although exemptions under 3.3.3.2.1 could be further clarified to include vessels not fishing with mesh gear (e.g., hook and line). The sub-option would weaken the closed areas by creating loopholes for complying with the measure. If adopted, the NEFMC should request the Mid-Atlantic Council to take complementary action through Amendment 14. All small-mesh gear types capable of significant river herring bycatch should be prohibited from fishing in the closed areas regardless of the target species.*

Management Measures to Address Midwater Trawl Access to Groundfish Closed Areas (Section 3.4)

- **3.4.4 Groundfish Alternative 5: Closed Areas: The year-round groundfish closed areas would be closed to midwater trawl vessels.**

  The groundfish closed areas were designed to protect sensitive groundfish spawning grounds as well as reduce fishing mortality on groundfish. Groundfish fishermen have sacrificed their access to these areas for these important conservation benefits, and it is inappropriate for the Council to continue to allow midwater trawl vessels access to these areas knowing that significant bycatch of groundfish will occur. Consideration must also be given to the foraging needs of groundfish and the impacts of localized depletion of forage fish by permitting industrial-scale harvest of herring in these special areas. For example, cod feeding is linked to spawning and other bio-energetic processes and is timed to coincide with migrations of Atlantic herring and other forage fish.[18] *Since mackerel have been harvested by midwater trawl vessels fishing within the closed areas, (Amendment 5 DEIS, Table 185, p. 491) all midwater trawl vessels should be prohibited, not just those that have not declared out of the fishery.*

A key objective of Amendment 5 is to monitor and minimize incidental catch in the herring fisheries, particularly bycatch of river herring and shad. The ASMFC Interstate FMP for these species mandates the closure of state fisheries for shad and river herring unless the state can demonstrate that its fishery is sustainable. As a result, the majority of states have already implemented river herring moratoriums. Limits on fishing for American shad are imminent for 2013. Some of these closures are due to inadequate resources to monitor the fisheries and document sustainability. The burden of proof rests entirely on the shoulders of river herring and shad fishermen, the same men and women who in many cases are actively engaged in efforts to improve water quality and restore habitat and fish passage. There is no such burden of proof on fisheries catching river herring and shad in federal waters. Despite insufficient monitoring and data to prove that levels of incidental catch are sustainable, the catch in federal fisheries is for all intents and purposes unrestricted.

[18] Smith, B. E., Ligenza, T. J., Almeida, F. P. and Link, J. S. (2007), The trophic ecology of Atlantic cod: insights from tri-monthly, localized scales of sampling. Journal of Fish Biology, 71: 749–762.

Depleted to historic lows, river herring and shad are in serious need of conservation and management in federal waters. Alewife and blueback herring are under review for a threatened listing under the Endangered Species Act.[19] Because of their shared role in the food web, the health of the Atlantic herring, river herring and shad resources are inextricably linked. Therefore, effective management of the Atlantic herring fisheries hinges on taking into account these ecological relationships. By adopting robust monitoring and incidental catch measures to better account for and protect forage species, the New England Council will be taking an important step forward in its move to an ecosystem-based approach to fisheries management.

Sincerely,

Pam Lyons Gromen

Pam Lyons Gromen
Executive Director

[19]Listing Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List Alewife and Blueback Herring as Threatened Under the Endangered Species Act, " 76 Federal Register 212 (02 November 2011), pp 67652-67656.

May 29, 2012

1566 Main Street
Chatham, MA 02633

PHONE
508.945.2432

FAX
508.945.0981

www.ccchfa.org

BOARD OF DIRECTORS

Eric Hesse
Chairman

Nick Muto
Vice Chairman and Treasurer

Andy Baler
Clerk

Fred Bennett

Elliott Carr

Bruce Kaminski

Phil Marshall

Kurt Martin

William Martin

Jim Nash

Greg Walinski

Daniel Morris, Regional Administrator
NOAA Fisheries Service, Northeast Regional Office
55 Great Republic Drive
Gloucester, Massachusetts 01930-2276
Re: Comments on Draft Herring Amendment 5

Dear Mr. Morris,

I appreciate the opportunity to comment on the management measures proposed in Amendment 5 to the Atlantic Herring Fishery Management Plan and am writing today in support of the actions below. I believe that adopting these actions will be instrumental in improving the management of the Atlantic Herring resource-the cornerstone of New England's commercial fisheries. Since the initiation of the first Amendment, the Cape Cod Commercial Hook Fishermen's Association has tried to improve management of this fishery the only way possible: with accurate and verified catch reporting. Despite these efforts, there has been a serious decline in the Atlantic Herring resource and we find ourselves no better equipped to address this issue than a decade ago. Put simply, there is no replacement for complete catch data.

The process of implementing Amendment 5 has been long; it was first initiated in 2007, sparked by concern over the inadequacy of much needed information regarding the herring fishery. To date, the data has been inconsistent and of varying quality, which has only underscored the problem. It has not served you as managers of our resource, nor the public. Now that we are approaching the final decision, I hope the Council will take steps to improve the quality of decision-making in the future. In particular, I see a strong need for 100% observer coverage on Category A and B midwater trawl vessels, limitations on dumping with real consequences, and accurate reporting of all landed catch. The Council should also revisit regulations granting these vessels access to groundfish closed areas, and establish additional measures to protect declining River Herring stocks.

- <u>100% Observer Coverage on Category A and B Herring Vessels (Section 3.2.1 Alternative 2)</u>

The Category A and B herring fleet is comprised of a small number of efficient, high-volume midwater trawl vessels responsible for catching roughly 98% of the herring landed annually. These vessels use large nets with small, 2-inch mesh to target herring, a forage stock also targeted by cod, pollock, tuna, and bass. As such, it is not surprising that midwater trawl vessels experience gear interactions with these commercially important species, and it is absolutely essential that we quantify the extent to which this occurs. Current observer coverage is insufficient when considering the scale of these operations and the repercussions of large bycatch events. For this reason, requiring 100% observer coverage is common practice among high-volume fishing fleets worldwide.

With this in mind, I urge the Council to adopt a comprehensive catch monitoring program and pursue all cost-saving opportunities available to make it affordable for NMFS and the herring industry. One option to reduce costs is through the approval of non-governmental 3rd party observer providers, which would minimize the financial burden of funding observer coverage.

- Closed Area I Provisions with Trip Termination after Ten Events (Section 3.2.3.4 Option 4C)

A comprehensive monitoring program documenting all catch in the herring fishery must include discards, but industry dumping practices make that impossible. To address this shortcoming, I urge the Council to adopt Closed Area I provisions for all limited access herring trips.

These provisions have been successful at safely discouraging dumping practices in Closed Area I thus far, and incorporating disincentives in the form of dumping event limits with trip termination as a consequence will only serve to strengthen this action. This measure, in combination with 100% observer coverage, will provide a much needed understanding of catch composition in this fishery.

- Accurate Weighing and Reporting of Catch (Section 3.5.1 Option 2)

It is impossible to effectively manage a fishery of this magnitude without knowing the actual quantity of fish harvested. I hope that the Council will establish long-overdue regulations requiring the herring fishery to abide by the same standards as other New England fisheries and accurately weigh its catch.

- Discontinue Access to Groundfish Closed Areas for Herring Vessels (Section 3.4.4 Alternative 5)

Existing regulations permit midwater trawl vessels to fish in areas known to be critical for struggling groundfish populations. Since the decision to grant the fleet access to these areas, there have been continued concerns about its impact on groundfish mortality and spawning aggregations. Allowing herring vessels continued access to these areas conflicts with the rebuilding of groundfish stocks, and negates the sacrifice being made by New England's groundfish fleet.

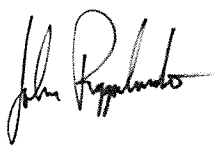
- Creation of a River Herring Catch Cap (Section 3.3.5)

River Herring stocks in New England are depleted and in dire need of additional protections. It is the Council's responsibility to develop measures reducing gear interactions with these stocks. While it may not be feasible to address this need fully in Amendment 5, the Council should strive for progress by initiating measures, such as a River Herring catch cap. A science-based cap on bycatch is the best solution to protect River Herring in the long run. Below that cap, I trust the Council, the herring industry, and the National Marine Fisheries Service to identify the best methods available for effectively managing this stock.

Unanswerable questions and anecdotal information have dominated discussion surrounding this management plan. I hope the Council will recognize that Amendment 5 presents an important opportunity for them to recommend much needed catch monitoring and accountability measures intended to better regulate the fishery and protect the Atlantic herring resource. I urge the Council to seize this opportunity and establish rules that will ensure the longevity of the herring resource for fish and fishermen alike.

Thank you for your attention to this important issue.

Sincerely,



John Pappalardo

New England Aquarium

Protecting the blue planet

May 31, 2012

Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street, Newburyport, MA 01950

Re: Comments on the Draft Environmental Impact Statement for Amendment 5 to the Atlantic Herring Fishery Management Plan

Dear Mr. Howard:

The New England Aquarium supports the adoption of progressive, conservation-oriented management measures to improve monitoring, minimize interactions, and facilitate recovery of river herring populations in New England. Consistent with that goal, we provide the following comments concerning specific management options proposed in the Draft Environmental Impact Statement (DEIS) for Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP).

The New England Aquarium is one of the most prominent and popular aquariums in the United States, with more than 1.3 million people visiting our exhibits annually. We are a global leader in ocean exploration and marine conservation with research scientists working around the world for the preservation and sustainable use of aquatic resources. In New England, we have been actively working with a range of diverse stakeholders to protect marine and coastal ecosystems from adverse human impacts, and to conserve vulnerable animals and habitats, for more than thirty years.

In a letter to the Council dated September 20, 2011, the New England Aquarium asked the Council to consider approving for public comment the full range of management alternatives developed in draft Amendment 5. We applaud the Council for doing so and thus demonstrating its commitment to and support of meaningful reform of the Atlantic herring fishery.

As stated in our previous letter, we are particularly concerned with the depletion and lack of recovery of river herring populations throughout New England and elsewhere along the Atlantic coast. As such, we now urge the Council to consider adopting measures to improve monitoring and minimize interactions with river herring. Specifically, we support:

- 100% at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of Atlantic herring catch and bycatch of river herring, shad, groundfish and other non-target species.
- A prohibition on herring fishing in areas and times identified for river herring protection (e.g., river herring bycatch "hot spots") to protect river herring and the predators that depend on their coastal migrations.
- A catch cap on the amount of river herring that can be caught in the Atlantic herring fishery to be implemented as soon as is practicable.
- A prohibition on herring midwater trawling in areas established to protect rebuilding groundfish populations.
- A requirement to bring *all* catch aboard fishing vessels to ensure accurate sampling by an independent observer and establishment of accountability measures to mitigate release or dumping of unsampled catch.

Additionally, we support continued collaborative research on river herring bycatch avoidance and the use of innovative fisheries financing strategies to fund current and future research and monitoring efforts.

We believe this effort to establish greater certainty and accountability within the Atlantic herring fishery is an important step in the recovery of river herring. We appreciate your consideration of these comments. Please do not hesitate to contact us if you have any questions or need more information.

Sincerely,

Bud Ris

Bud Ris, President and Chief Executive Officer

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Friday, June 01, 2012 10:05 AM
To: Rachel A. Neild
Subject: Fwd: Amendment 5 comment

---------- Forwarded message ----------
From: **Seth Lattrell** <slattrell@bournece.com>
Date: Tue, May 29, 2012 at 8:44 AM
Subject: Amendment 5 comment
To: heramendment5@noaa.gov

May 13th, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

I've spent 11 years as a commercial fisherman, 2 years as a writer for a commercial fisheries publication, and now 6 months as an environmental consultant, so I have seen this issue from multiple angles. The council needs to take a stand and realign their priorities in compliance with the Magnuson Stevens Act. Manage the fishery, not the personal agenda of any leadership or businesses. This is a critical moment and a crucial amendment for the future of fisheries in the northeast, please treat it as such and make the decision that is of the greatest benefit to both the ecosystem and the majority of the industry.

At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate

data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Sincerely,

Seth Lattrell

Regulatory/Permitting Specialist

BOURNE CONSULTING ENGINEERING

3 Bent Street

Franklin MA, 02038

(508) 533-6666 (Phone)

Slattrell@bournece.com

From: Earthiustice <action@earthjustice.org> on behalf of M McGillivary

Sent: Monday, March 19, 2012 7:28 PM
To: comments
Subject: Comments on Draft Amendment 5

Example of 3/13 **Batch**
Emails Rec'd to date
updated 6/1/12

Mar 19, 2012

Captain Paul Howard, New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Captain Howard, New England Fishery Management Council,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem. Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns.

I am especially concerned about populations of river herring, which have declined by 99 percent and are so depleted that they are being considered for protection under the Endangered Species Act.

Most Atlantic states now ban the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch in the industrial fishery targeting a different species, Atlantic herring.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. The New England Fishery Management Council must support, not undermine, these efforts.

Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet. I strongly urge you to approve a comprehensive monitoring and bycatch-reduction program that incorporates the following management actions:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
* 100 percent at-sea monitoring on all mid-water trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,

M McGillivary

Eugene, OR 97401

Joan O'Leary

Example of 642 **Batch Emails Rec'd to date**

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Friday, June 01, 2012 12:39 PM
To: Rachel A. Neild
Subject: Fwd: Comments on Draft Amendment

---------- Forwarded message ----------
From: **Timothy Holmes** <timothygholmes@gmail.com>
Date: Tue, May 22, 2012 at 2:00 PM
Subject: Comments on Draft Amendment
To: heramendment5@noaa.gov

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

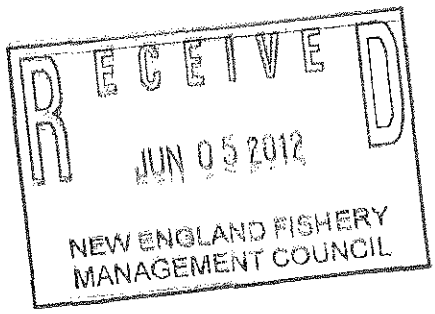
By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,
Tim Holmes

RICHARD SHANAHAN
5 SHORE DRIVE
BRANFORD, CT 06405

June 1, 2012

Captain Paul J. Howard
Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950



Dear Capt. Howard:

The undersigned organizations – representing a broad range of conservation groups, watershed associations, anglers, and recreational enthusiasts working to protect and restore Long Island Sound and its tributaries – urge you to request that Connecticut's representatives at the New England Fishery Management Council (NEFMC) adopt the strongest possible protections for river herring in the Atlantic herring fishery.

Long Island Sound's rivers and waterways once supported prolific runs of alewife and blueback herring, but in recent decades the number of fish returning to rivers each year has dramatically declined, to the point that they are now being considered for listing under the Endangered Species Act[1]. According to the Connecticut Department of Energy and Environmental Protection (DEEP), millions of river herring once returned annually to Connecticut, but environmental officials say that by 2006, only 21 passed the Holyoke Dam on the Connecticut River[2]. According to the Long Island Sound National Estuary Program, herring populations have declined precipitously in all Long Island Sound rivers over the past few decades.[3] Today, their numbers have dwindled to the point that monitoring this spring (between March and May 1, 2012) at 13 coastal rivers, generally considered to be the State's most productive herring river runs, recorded a total number of alewife and blueback herring of less than 500,000.[4]

River herring – both alewife and blueback herring – are a key component of the food web of the Sound. Not only are they critical forage food for our major Sound game fish – striped bass and blue fish – but a wide array of coastal birds and other wildlife feed on a combination of adult or young herring. For this reason, our organizations, in collaboration with the Connecticut DEEP and the New York Department of Environmental Conservation, have worked diligently to open rivers and streams that feed into the Sound, with substantial success. This public-private partnership has already opened up more than 150 miles of valuable freshwater spawning habitat that was previously blocked by dams. In addition, we continue to support the State of New York's exploration, and the State of Connecticut's continued renewal, of a moratorium on river herring harvest in the Sound. While we do everything we can to open up more breeding habitat and conserve herring in our coastal areas, this alone is not enough. We know our herring spend most of their adult life in the north Atlantic. Therefore, their recovery is dependent on your Council providing strong protections for herring throughout this north Atlantic area.

[1] NOAA Release, November 1, 2011, announcing consideration of listing river herring under ESA
[2] CT DEEP Press Release of April 3, 2012, announcing continuation of ban on river herring harvest.
[3] Long Island Sound Study, *Sound Update*, May/June 2009
[4] CT DEEP, Weekly Diadromous Fish Report, May 1, 2012

We believe that ocean bycatch is a significant concern, a finding that was recently confirmed by the 2012 River Herring Stock Assessment and Peer Review. Data obtained by the Northeast Fisheries Observer Program shows that between 2 and 5 million alewife and blueback herring were caught annually between 200S and 2010, with the majority taken in the single and paired midwater trawl fishery for Atlantic herring in New England[5]. In some instances, hundreds of thousands of river herring have been removed in single net tows[6]. Considering that up to a half million river herring can be destroyed by a single net tow, this is the rough equivalent of the total number of river herring monitored this spring passing up 13 of Long Island Sound's most productive rivers. [7] These statistics are alarming and warrant immediate management measures that will promote the conservation and recovery of these species. To this end, we offer the following recommendations to improve monitoring and limit catch of river herring in the Atlantic herring fishery.

Set a limit on river herring catch: As mentioned above, the recent stock assessment concluded that ocean catch of river herring can be substantial, amounting to millions of fish caught each year. As a federally-listed species of concern and candidates for listing under the Endangered Species Act, river herring should be given the strongest protections possible, including setting a limit in the next fishing year.

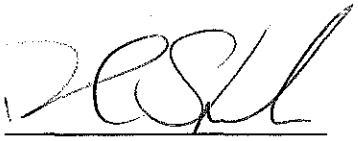
Support 100% monitoring on all midwater trawl vessels: Single and pair midwater trawling for herring has raised serious concerns in the region due to their enormous catching capacity and potential impacts to depleted river herring and the overall health and productivity of the marine ecosystem. Comprehensive catch monitoring, including a requirement for scientific observers on all midwater trawlers, will greatly enhance data collection and lead to better estimates of all catch, including bycatch of river herring.

Strengthen accountability on dumping of unmonitored catch: The dumping of unobserved catch (i.e., release or slipping catch at sea) should be minimized to the maximum extent practicable to support accurate sampling and catch reporting. Herring vessels should be required to make all catch available for sampling by an observer. Strong accountability measures, such as limiting the fleet to five slipped catch events per management area, should be adopted as a disincentive to dumping catch at sea.

Require weighing and reporting of all catch: All catch delivered to port should be weighed and independently verified to ensure accurate reporting and assessment of bycatch.

We appreciate your consideration of our concerns and thank you for your continued leadership and commitment to the sustainable management and conservation of our State's natural resources.

Sincerely,



Richard Shanahan

[5] River Herring Benchmark Assessment Report, May 2012
[6] Data obtained from the Northeast Fisheries Observer Program
[7] CT DEEP, Weekly Diadromous Fish Report, May 1, 2012

Curt Johnson
Program Director
Save the Sound, a program of Connecticut Fund for the Environment

Andrienne Esposito
Executive Director
Citizens Campaign for the Environment

Sandy Breslin
Director of Governmental Affairs
Audubon Connecticut

Daniel Snyder, PhD.
Shoreline Shellfish, LLC and Sound Marine Skills, Inc.

Chantal E. Collier
Director, Long Island Sound Program
The Nature Conservancy

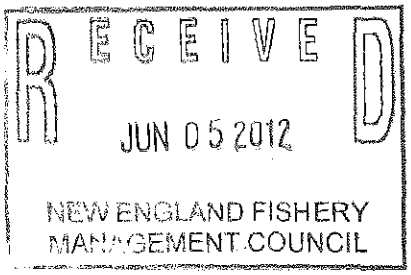
Albert E. Caccese
Executive Director
Audubon New York

Tim Visel
Coordinator
The Sound School

Margaret Miner
Executive Director
Rivers Alliance of CT

TOM CLEVELAND
75 Garnet Park Road
Madison, CT 06443

June 1, 2012



Captain Paul J. Howard
Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Captain Howard:

I want to urge you to support mandatory federal or state monitoring of all mid-water trawling to protect the river herring populations in the New England areas. I have worked for 15 years with the CT DEEP and land trusts and other conservation groups here in the New Haven area putting up fish ladders and taking down dams and other impediments to migration.

All of the work and investment in these fresh water migratory corridors will be for nought if the trawlers are allowed to continue to vacuum up the herring while they are at sea.

This year was a disappointing year for one of the fishways on which I have worked, the Branford Supply Pond fishway. We opened it up in April 2006 with 3,000 fish counted going through the fish ladder. The watershed that was opened has about 50 acres of pond habitat and 5 miles of stream habitat. When the Class of 2006 came back in April 2010, we counted 40,000 fish! All over the place!

But this year, we counted 600 fish! And we believe that the time has come for you to do something about the offshore management of the herring fishery. If we have to have higher prices for lobster or pet food, so be it. If the trawler owners have to scale back operations, so be it.

Thank you for your consideration.

Tom Cleveland

203-981-9040

tgcleve@yahoo.com

Executive Director
James A. Donofrio

May 24[5h], 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Nordeen:

On behalf of the Recreational Fishing Alliance, a national 501(c)(4) grassroots political action organization that has been representing individual sport fishermen and the sport fishing industry since 1996, I would like to submit the following comments in regards to the Environmental Impact Statement (EIS) for Herring Amendment 5

The herring resource supports almost every other fishery in our fishery and therefore management of this species is critical to many thousands of RFA members here in New England. Since this process began, we have been calling for the Council to finally address the many outstanding issues within the herring fishery, especially in regards to the large single and pair midwater trawlers. Now that the time for final decisions has come, we urge the Council to do the following:

First, the Council should require 100% observer coverage on the Category A and B vessels that catch roughly 98% of the quota. (Section 3.2.1.2 Alternative 2). Where boats of this size and power are allowed elsewhere in the country, at least 100% coverage is required, and the same should be true here.

Second, the Council should implement Closed Area I (CAI) provisions with trip termination after 10 events on Category A and B vessels (Section 3.2.3.4 Alternative 4C). Until the Council implements dumping accountability measures with real teeth, all data collected in this fishery will be suspect. By requiring the above measure, the Council will ensure that it has accurate data on this fishery.

Third, the Council should implement catch weighing across the fishery. (Section 3.5.1 Option 2). Given the importance of this resource there is absolutely no reason that we should be relying on self-reported estimated of landings.

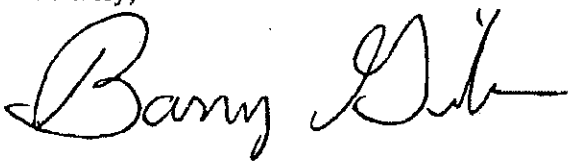
Lastly, the Council should rescind access for midwater trawlers to groundfish closed areas. (Section 3.4.4 Alternative 5). Everyone knows these boats can and do tow near bottom and catch groundfish. As such, they should not be allowed into the closed areas,

especially given the current status of cod and haddock and the stringent rules being placed on directed groundfish vessels.

This amendment has taken five years to produce and it is finally time for the Council to make the right decisions to ensure that this fishery is better managed. This resource is too important to be managing inadequately.

Thank you very much for your consideration.

Sincerely,



Barry Gibson, New England Director
Recreational Fishing Alliance
19 Royall Rd.
East Boothbay, ME 04544

May 24th, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 EIS

Dear Carrie,

I am writing today to offer my comments on the Environmental Impact Statement (EIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

• 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

• Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

• Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

• Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

'ED MAY 2 8 2012

George
5/22cc: Pete C.
Aja
Carrie
Lindsay

Mr. Daniel Morris
Acting Regional Administrator/Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2298

May 17, 2012

I am writing because the Mid-Atlantic Fishery Management Council will meet in June to decide how to protect river herring and American shad at sea and I ask your help to save these treasured species.

River herring and shad play an immensely important role in the health of our coastal ecosystems. As food for larger fish, they help sustain commercial and recreational fisheries on the East Coast and contribute to the economies of many coastal river towns. Now, they are in critical condition because their populations have declined by more than 97 percent.
You can help secure the first meaningful protections for these fish in the ocean. Millions are caught each year, mostly by industrial trawlers targeting Atlantic mackerel. These massive boats tow football field-size nets and indiscriminately kill millions of pounds of unintended catch annually, including river herring, shad, bluefin tuna, cod, haddock, and striped bass, as well as whales, dolphins, and seabirds.
For years, our coastal communities have worked tirelessly to restore culturally and economically significant species such as river herring and shad to rivers along the Atlantic coast. At the same time, the incidental catch of millions of river herring and shad annually by the mid-Atlantic mackerel and squid fisheries remains largely unmonitored and unregulated. I am deeply concerned about this serious, ongoing threat to these already-depleted species that undermines our efforts to restore our estuaries and rivers.

I have read that river herring and shad populations are at historic lows and have declined coast wide by 99 and 97 percent, respectively. In response to this, most Atlantic states prohibit the taking of river herring in coastal waters and are advancing similar restrictions on American shad. These populations are in dire need of conservation and management, so it is critical that they are given protection in federal waters under Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan.

In light of the depleted status of these fish, I agree with those who ask the Council to choose the option with the most positive biological impact.

Inclusion of river herring and shad as stocks within the fishery. (Alternative 9b-9e).
Developing the long-term protections associated with designating river herring and shad as stocks in the fishery will take time. Therefore, the Council should adopt the following interim measure to immediately reduce and limit the at-sea catch of river herring and shad: A catch cap, effective in 2013 **(Alternative 6b-6c)** that functions effectively, does not increase wasteful discarding, and cannot be circumvented by simply declaring into another fishery. These alternatives should be modified to more effectively ensure that directed mackerel fishing stops if a cap is reached by lowering the amount of mackerel that can be fished for, possessed or retained.

Also, I urgently ask you to incorporate all of the following:

- One hundred percent at-sea monitoring on all mid-water trawl fishing trips. One observer must be assigned to each vessel in a pair trawl operation. **(Alternative 5b4 and Alternative 3d).**
- An accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling **(Alternative 3j with operational discards prohibited).** If dumping is allowed, include a fleet wide limit of ten dumping events **(Alternative 3l and 3n)** and require vessels that dump to take an observer on their next trip **(Alternative 3o).**
- A requirement to weigh all catch. **(Alternative 2c-2f).**

Currently, millions of pounds of river herring, American shad and other fish are scooped up indiscriminately by industrial trawlers targeting Atlantic mackerel. Massive boats tow football field-size nets that pick up fish, whales, dolphins, seabirds -- anything in their path. It is time to rein in these massive trawlers, and restore balance to the Atlantic.

Thank you for your commitment to these priority reforms and the health of our waters.
Yours truly, J. Capozzelli, New York

MAY 21 2012

May 18, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

I would like my grandchildren to be able to enjoy and experience the ocean as I have.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large mid-water trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these issues are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping by Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring mid-water trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed into these areas. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to remedy many of the most pressing issues in this fishery. Please do what is right and approve these measures.

Thanks for your time,

Daniel Simsay

RECEIVED MAY 2 8 2012

SFD
George
5/25 cc: Pete C
Aja
Carrie
Lindsey

5-12-12

Mr. Daniel Morris
Deputy Regional Administrator
NMFS
55 Great Republic Dr.
Gloucester, Mass. 01930

Dear Mr. Morris:

I am writing on behalf of the Delaware River Shad Fishermen's Association (DRSFA). We are a 700 member conservation group working to preserve, protect and restore migratory fish to the Delaware River and its tributaries. We strongly support the most vigorous protection of the remaining shad and herring species along our Atlantic coast.

For years, our coastal communities have worked tirelessly to restore culturally and economically significant species such as river herring and shad to rivers along the Atlantic coast. At the same time, the incidental catch of millions of river herring and shad annually by the mid-Atlantic mackerel and squid fisheries remains largely unmonitored and unregulated. I am concerned about this serious, ongoing threat to these already-depleted species that undermines efforts to restore our estuaries and rivers.

River herring and shad populations are at historic lows, and landings have declined coastwide by 99 and 97 percent, respectively. In response, most Atlantic states prohibit the taking of river herring in coastal waters and are advancing similar restrictions on American shad. These populations are in dire need of conservation and management, so it is critical that they are given protection in federal waters under Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. Because these fish have been depleted so severely, the council should choose the option with the most positive biological impact:

Inclusion of river herring and shad as stocks within the fishery (Alternative 9b-9e).

Developing the long-term protections associated with this designation will take time. Therefore, the council should adopt the following interim measure to immediately reduce and limit the at-sea catch of river herring and shad:

**A catch cap, effective in 2013 (Alternative 6b-6c), that functions effectively, does not increase wasteful discarding, and cannot be circumvented by simply declaring into another fishery. These alternatives should be modified to more effectively ensure that directed mackerel fishing stops if a cap is reached by lowering the amount of mackerel that can be fished for, possessed, or retained.

I strongly urge you to also incorporate all of the following:

**100 percent at-sea monitoring on all mid-water trawl fishing trips. One observer must be assigned to each vessel in a pair trawl operation (Alternative 5b4 and Alternative 3d).

MAY 21 2012

**An accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling (Alternative 3j with operational discards prohibited). If dumping is allowed, include a fleetwide limit of 10 dumping events (Alternative 3l and 3n) and require vessels that dump to take an observer on their next trip (Alternative 3o).

**A requirement to weigh all catch. (Alternative 2c-2f).

Thank you for the opportunity to comment and for your commitment to these priority reforms.

Charles Furst

Charles Furst, President DRSFA
Po 221
Solebury, Pa 18963

Northeast Charterboat Captains Association

P.O. Box 7 ⚓ Sturbridge, MA 01566 (800) 526-8152
66 High Road ⚓ Newbury, MA 01951 (978) 465-2307

May 25, 2012

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5

Dear Carrie,

I am writing on behalf of the Northeast Charterboat Captain's Association (NCCA) to comment on the Amendment 5 Environmental Impact Statement (EIS). NCCA is an organization of over 80 professional charter boat captains and small-business owners from Massachusetts through Maine.

Herring management is a key concern for NCCA members and their thousands of fishing customers due to both the importance of herring as forage and the potential for bycatch by the large midwater trawlers that dominate the fishery. As such, we believe Amendment 5 is of fundamental importance to our future. For too long these large vessels have been fishing with rules that are inadequate.

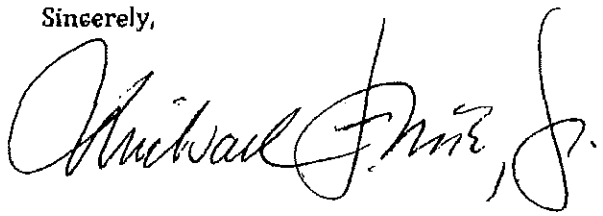
In order to better manage the herring fishery, the Council should approve the following measures:

- 100% observer coverage on Category A and B herring vessels (Section 3.2.1.2 Alternative 2).
- Closed Area I (CAI) provisions with trip termination after 10 dumping events on Category A and B vessels. (Section 3.2.3.4 Alternative 4C)
- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. (Section 3.4.4 Alternative 5)
- Implement measures to require weighing of catch across the fishery (Section 3.5.1 Option 2)

05/25/2012 12:50 FAX 508 347 5830 NEMS 002

The measures we are asking for above will go a long ways towards bringing some accountability to this fleet. We urge the Council to do what is right and put these measures in place.

Sincerely,



Michael Sosik, President
Northeast Charterboat Captains Association
P.O. Box 7
Sturbridge, MA 01566

Maine Coast Fishermen's Association

PO BOX 112 Topsham ME 04086
Phone: 207.619.1755 Fax: 866.876.3564

RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Board of Directors
Gerry Cianchette, President
Gary Libby, Vice President
Larry Baker, Treasurer
Joe Lovely, Clerk
Tony Maitland
Adam Hamilton
Dale Leighton
Bob Nakashima
Patrick Murray
Executive Director
Sue Hansen

To: Chairman Cunningham
New England Fisheries Management Council
50 Water Street
Newburyport MA, 01950

June 1, 2012

RE: Draft Amendment 5 to the Atlantic Herring FMP

Dear Chairman Cunningham,

The Maine Coast Fishermen's Association is an industry based non-profit which identifies and fosters ways to restore the fisheries of the Gulf of Maine and sustain Maine's historic fishing communities for future generations. Established and run by Maine community-based fishermen, MCFA works to enhance the ecological and financial sustainability of the fishery through balancing the needs of the current generation of fishermen along with the long term environmental restoration of the Gulf of Maine. With members living in Maine communities ranging from Kittery to Mount Desert Island, our fishermen represent a diversity of Maine fishing but have come together to form a cohesive voice to weigh in on important management issues facing the groundfish fleet of Maine. As such, please accept our comments on Amendment 5 to the Atlantic herring fisheries management plan.

As stewards of the Gulf of Maine, ensuring a healthy and vibrant environment is the foundation of maintaining successful businesses and successful coastal communities. The groundfish industry has taken important steps in rebuilding the species that they rely on, such as cod, haddock, grey sole, and dabs, by being restricted from certain important habitat areas, adhering to mortality closures, using highly selective gear, and moving to allocation system with a hard total allowable catch. Despite all of these sacrifices, the groundfish in the Gulf of Maine are still declining, according to the most recent stock assessments, and fishermen are looking for answers. With less effort on the water than ever before one would expect species to rebound in a healthy environment, our best science is suggesting otherwise. Herring are a cornerstone species in the Gulf of Maine ecosystem and groundfish are heavily reliant on this species as forage. Herring trawlers have been known to cause localized depletion, turning a vibrant ecosystem into a wasteland over just a few days, and causing groundfish fishermen to watch as catch rates drop fivefold overnight.

This is not to suggest that there isn't a place for the herring fishery in the Gulf of Maine. Many Maine fishermen rely on herring for bait and want to see more successful fishing businesses out on the water. That being said, accountability is needed on a fishery that has the potential to negatively impact the marine environment in such a profound way. As such, below are our recommendations on specific management options throughout Amendment 5:

- **Prohibit mid-water trawl vessels from participating in the herring fishery in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).**

Certain areas throughout New England waters have been identified as being important areas to protect in order to rebuild the groundfish of New England. Some of these areas were identified by their habitat, others because of the high catch rates of groundfish associated with those areas. Regardless of the reason, the groundfish fleet was removed from these areas to rebuild groundfish stocks but in a strange turn of events the herring mid-water trawl fleet was not held to these same standards. As such the effectiveness of the closed areas has been marginalized and we have not seen the rebound in groundfish stocks one would expect. The prevailing argument has been that the "midwater" fleet doesn't catch groundfish, and doesn't fish on the bottom; therefor the rules should not apply.

New knowledge regarding the frequency and severity of midwater trawls on the seafloor and higher rates of haddock bycatch inside CAII compared to outside CAII (calculated in the FW46 analysis) suggest that this assessment was wrong. Additionally, the herring fleet themselves, at a recent stock assessment meeting, argued that the acoustic survey no longer was valid because the herring were on the bottom and no longer high in the water column. If the herring are hard on the bottom, one must question where these nets are fishing in order to catch their target species? More importantly though, the means that these vessels took to gain access to these areas was far different than anything a groundfish vessel would have to undergo to gain similar access. Any exceptions for access to important areas should be subject to the same appropriately high standards met by groundfishermen who are granted Experimental Fisheries Permits.

If the Council wants to be serious about rebuilding our groundfish stocks, we cannot rely on a patchwork of management plans that undermine the sacrifices of other segments of the fishing industry. The small-meshed herring fleet should not be allowed into groundfish closed areas and the Council should consider removing them indefinitely. There has been a lot of discussion about the closed areas being removed, through the groundfish or habitat plan, and the argument will be that we shouldn't worry about this option as the areas are going to be going away. Regardless of what the future holds for these areas, they have been identified as important to the success of the groundfish industry and have become the exclusive fishing ground of the largest vessels in the New England fleet. The herring fleet never should have been allowed in from the start, decisions were made under false assumptions, and we have been paying the price for over a decade. It is time to rectify this mistake.

- **Include 100 % observer coverage on category A and B vessels (Section 3.2.1 Alternative 2).**

Midwater herring trawlers are the biggest and most powerful vessels in New England and tow enormous small-mesh nets at high speed. They are targeting the primary forage stock in the region, thereby guaranteeing interaction with, and bycatch of, species such as cod, haddock, whiting, and bluefin tuna. Having the unique privilege to use such efficient gear in this manner should carry the unique responsibility to completely document your catch. The only way to know for sure what the impact of these boats is on species like cod is to require 100% observer coverage. Given the dramatic increases in coverage offshore that have driven the recent overall increases, it is clear that for some management areas the number of unobserved trips is likely much larger. There is great incentive to fish differently when an observer is on the boat, and this

practice is known to occur under low coverage rates. Therefore it is essential to have 100% coverage.

- **All catch should be accurately weighed and reported (5ection 3.1.5 Alternative 2).**

  This is a straight-forward option that should be easy for all parties to support. A captain should want to know that a dealer has an accurate report of his landings and a dealer must know how much fish he is selling to ensure he is making a profit on the product. Allow the industry to figure out how to do the weighing and require it reported in a timely manner. This will improve management, allow closer tracking of the catch, and ensure that all parties are treated fairly.

- **Include robust management measures to protect river herring in the Atlantic herring fishery, such as a catch cap (by modifying Section 3.3.5).**

  Maine is unique in New England in that we have a healthy river herring population in the majority of our rivers and allow for the harvesting of this species. It is highly regulated and important to the success of our many lobstermen. By allowing midwater trawlers to catch as much river herring as they like and not be held accountable for it we are undermining the work of those who have fought to restore river herring runs and those who sustainably harvest them shore side.

- **Regulate the number of allowed net slippage events for Category A and B vessels (such as Section 3.2.3.4 Option 4D).**

  Unlike groundfish trawlers, most herring midwater trawlers pump their catch aboard before bringing the net aboard; as such, these boats can dump or "slip" unwanted catch before it is sampled. At the root of Amendment 5 is industry accountability and slippage undermines all the data that is collected on catch, bycatch, and the industry. The success of the recently implemented rules in Closed Area I prove that such measures are effective at reducing dumping in a safe manner. The Council should require similar rules throughout the geographic range of the fishery, in combination with 100% observer coverage, to know for sure what amounts of herring, river herring, cod, and other species are being caught. The key to dumping accountability rules is to have real disincentives so that legitimate exceptions are not abused and turned into loopholes and this measure will do just that since it will not rely on self-reporting and the use of affidavits.

The development of Amendment 5 has been half a decade in the making and the Council has created a document with a suite of options that will address all the most pressing issues facing this industry. It is vitally important to the ecosystem of the Gulf of Maine and the future of all fishing businesses that Amendment 5 results in a comprehensive management plan that provides real data, real accountability, and real benefits for the region. I think you for your time and consideration in this important process.

Sincerely,



Ben Martens
Executive Director

June 4, 2012

RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Daniel S. Morris, Acting Regional Administrator
NMFS, Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930.

RE: Comments on Amendment 5 to the Atlantic Herring FMP

Dear Mr. Morris:
We, the undersigned, write to provide a joint comment on Amendment 5 to the Atlantic Herring Fishery Management Plan.

In response to a primary goal of this Amendment to improve monitoring in the herring fishery, we support 100% observer coverage in the fishery. The public has provided extensive comments on perceived issues of concern and while we feel that much of this is contrived, we also recognize that these concerns will not be laid to rest without comprehensive observation.

A major obstacle in implementing this coverage is overall cost and identifying who will pay. The current estimate of $1,200 per sea day for an at-sea federal observer is not a cost that can be borne by the fishery if our objective is to continue to have a viable herring fishery in the Northeast.

However as industry participants, we are not unwilling to pay a fair cost to support the program. We look to the North Pacific industry costs for observer coverage in the groundfish fisheries of the Bering Sea (Pollock and non-AFA) to seek equity at their current rate of $325 per sea day for our contribution to the program.

In addition, we request the Agency conduct a review 2-years following implementation that will include a cost benefit analysis of the allocation of resources needed to carry on the program on a continuing basis to meet the needs of accuracy in catch accounting for the fishery.

We remind the Agency that the Council has identified multiple goals for a catch monitoring program for the herring fishery that include developing a cost effective program that will foster support by the herring industry and others concerns about accurate accounts of catch and bycatch. We encourage the Agency and Council to continue work on a program that will meet these goals.

Thank you for the opportunity to comment,

Frank O'Hara
O'Hara Corporation
Rockland, Maine

Dave Ellenton
Cape Seafoods
Gloucester, Massachusetts

Jeff Reichle
Lunds Fisheries, Inc
Cape May, New Jersey

Jonathan Shafmaster
Little Bay Lobster LLC/S.F. Offshore Inc
Newington, New Hampshire

CHOIR COALITION

Coalition for the Atlantic Herring Fishery's Orderly, Informed and Responsible Long Term Development

RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

June 4th, 2012

Ms. Carrie Nordeen
NMFS Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 Environmental Impact Statement

Dear Carrie,

I am writing today on behalf of the undersigned CHOIR supporters to comment on the Amendment 5 Environmental Impact Statement (EIS) and to request that the Council take the specific actions listed below to ensure better management of the herring fishery. CHOIR is an industry coalition made up of commercial and recreational fishing organizations, fishing and shore side businesses, researchers and eco-tourism companies.

The Council initiated this amendment in 2007 in response to the widespread concerns of the fishing and ecotourism industries and the general public regarding the inadequate management and monitoring of the large herring pair and single midwater trawlers. These concerns are just as real today as they were five years ago: observer coverage levels are still inadequate; dumping catch before it is sampled is still allowed in most areas; catch weighing is still based on self-reported estimations; and, finally, these vessels are still given full access to Groundfish Closed Areas (GFCAs).

We first urge the Council to implement 100% observer coverage on Category A and B herring vessels *(Section 3.2.1, Alternative 2).* Selecting these measures only for A and B boats will allow the Council to cover the small number of large vessels that are responsible for over 97% of the total herring landings, thus reducing cost and complexity. Elsewhere in the country boats like these would be required to carry at least 100% observer coverage and we feel the same should be happening here.

These herring trawlers are the biggest and most powerful vessels on the entire coast and tow enormous small-mesh nets at high speed. They are allowed to tow anywhere in the water column, as well as in GFCAs and areas known to hold large amounts of river herring. They are targeting the primary forage stock in the region, thereby guaranteeing interaction with, and bycatch of, species such as cod, pollock, whiting, striped bass and bluefin tuna. Having the unique privilege to use such efficient gear in this manner should carry the unique responsibility to completely document your catch. The only way to know for sure what the impact of these boats is on species like cod and river herring is to require 100% coverage.

While it is true that there have been modest increases in observer coverage in recent years, coverage levels are still far too low, with 60 to 70 percent of trips unobserved fishery-wide. Given the dramatic increases in coverage offshore that have driven the recent overall increases, it is

clear that for some management areas the number of unobserved trips is likely much larger. There is great incentive to fish differently when an observer is on the boat, and this practice is known to occur under low coverage rates. Therefore it is essential to have 100% coverage.

Second, the Council should implement Closed Area I (CAI) provisions with trip termination after ten events in order to reduce dumping on Category A and B vessels *(Section 3.2.3.4 Option 4C).* Unlike groundfish trawlers, most herring midwater trawlers pump their catch aboard before bringing the net aboard; as such, these boats can dump or "slip" unwanted catch before bringing it aboard for sampling. One species that may be dumped most often is Atlantic herring itself (if it is unmarketable due to being "feedy," small, or full of spawn, if mixed in with species like dogfish that cannot be pumped, or if mixed with any unwanted bycatch). The success of the recently implemented rules in Closed Area I prove that such measures are effective at reducing dumping in a safe manner. Now the Council must require similar rules throughout the geographic range of the fishery, in combination with 100% observer coverage, to know for sure what amounts of herring, river herring, cod, and other species are being caught. The key to dumping accountability rules is to have real disincentives so that legitimate exceptions are not abused and turned into loopholes and this measure will do just that since it will not rely on self-reporting and the use of affidavits.

Third, the Council should implement measures to require weighing of catch across the fishery *(Section 3.1.5 Option 2).* It is hard to understand how an important fishery in this day and age is not already weighing its catch. It is completely unacceptable to be basing landings totals on unverifiable estimations by the captains or dealers and we hope the Council will put an end to this practice.

Lastly, the Council should prohibit midwater trawl vessels participating in the herring fishery from access to Groundfish Closed Areas *(Section 3.4.4 Alternative 5).* These boats were allowed into the closed areas under the assumption that they could not catch groundfish; this assumption has since been proven false. There is no reason these boats should be towing small-mesh gear through areas off-limits to groundfish boats.

Since these boats entered the herring fishery in the nineties they have been a source of great controversy. This controversy originated in the fishing and other industries that rely on the ecosystem and, in turn, herring. Many of our supporters feel that a ban on pair trawling is the only solution to the problem and yet have worked hard to try and find a middle ground that will allow for this fleet to be managed properly without banning it outright. We hope that the Council will take this opportunity to make the right decisions and to finally put rules in place that are adequate given the realities of the way the fishery now operates.

Thanks for your time,

Stephen B Weiner

Steve Weiner, Chair

On behalf of the undersigned CHOIR supporters:

Commercial Fishing Groups, Organizations and Entities:

American Bluefin Tuna Association, Ex. Director Rich Ruais, Salem, NH
Northeast Coastal Communities Sector, Manager Aaron Dority
Maine Coast Fishermen's Association, Ex. Director Ben Martens, Brunswick, ME
Penobscot East Resource Center, Ex. Director Robin Alden, Stonington, ME
New Hampshire Commercial Fishermen's Association, President Erik Anderson
Northeast Hook Fishermen's Association, Pres. Marc Stettner, Portsmouth, NH
Cape Cod Commercial Hook Fishermen's Association, CEO John Pappalardo, Chatham, MA
Northeast Fisheries Sector III, Gloucester, MA
Commercial Angler's Association, Ex. Director Russell E. Cleary, Maynard, MA
Friends of South Shore Fisheries, President Skip DeBrusk, Scituate, MA
Martha's Vineyard/Dukes County Fishermen's Association, Pres. Warren Doty

Party/Charter/Recreational Groups and Organizations:

Maine Association of Charterboat Captains, Bath, ME
Sportsmen's Alliance of Maine, Augusta, ME
Boothbay Region Fish & Game Association, Boothbay, ME
Coastal Conservation Association - New Hampshire, Pres. Don Swanson
Northeast Tuna Club, President Jeremy Johnson, Peterborough, NH
Northeast Charterboat Captain's Association, Pres. Dave Auger
Stellwagen Bank Charter Boat Association, Pres. Steve James, Marshfield, MA
Cape Cod Charter Boat Association, President Buddy Wilson, Orleans, MA
Massachusetts Beach Buggy Association, President Scott Morris
Massachusetts Striped Bass Association, President Jim Dow, Braintree, MA
New England Charter Boat Association, President Todd Rodzen
New Inlet Boating Association, Skip Cornell, Marshfield, MA
League of Essex County Sportsmen's Clubs, Tom Walsh, Hawthorne, MA
Nantucket Angler's Club, Pres. Phil Albertson, Nantucket, MA
Green Harbor Tuna Club, President Lori Atwater, Green Harbor, MA
Plum Island Surfcasters, President Julio Silva, Newburyport, MA
Falmouth Fishermen's Association, Pres. George Costello, East Falmouth, MA
Maddie's Anglers Club, President Chip Wolcott, Marblehead, MA
Haverhill Ridge Runners Fish and Game Club, Vincent Monaco, Haverhill, MA
Rhode Island Saltwater Angler's Association, Pres. Steven Medeiros, Coventry, RI
Rhode Island Party & Charter Boat Association, Pres. Rick Bellavance, Warwick, RI
Connecticut Charter/Party Boat Association, Pres. Bob Veach, New London, CT
Recreational Fishing Alliance, Ex. Director Jim Donofrio, New Gretna, NJ
Freeport Tuna Club, President Bill Toohey, Freeport, NY
Atlantis Anglers Association, President Reed Reimer, Freeport, NY
New York Sportfishing Federation, Pres. Jim Hutchinson Jr., Forest Hills, NY
National Association of Charterboat Operators, E.D. Bobbi Walker, Orange Beach, AL
Delaware River Shad Fisherman's Association, Pres. Bill McWha

Marine Research and Education Organizations:

Atlantic Salmon Federation, Vice Pres. Andrew Goode, Brunswick, ME
Downeast Salmon Federation, Ex. Director Dwayne Shaw, Columbia Falls, ME

Acadia Institute of Oceanography, Sheri Gilmore, Seal Harbor, ME
Allied Whale, Director Sean Todd, Bar Harbor, ME
Cetos Research Organization, Director Ann Zoides, Bar Harbor, ME
Downeast Audobon Society, President Leslie Clapp, Ellsworth, ME
Somes Meynell Wildlife Sanctuary, Director Damid Lamon, Somesville, ME
Friends of Blue Hill Bay, President Barbara Arter, Blue Hill, ME
Friends of Maine Seabird Islands, Michael Thompson, Rockland, ME
Blue Ocean Society, Director Jen Kennedy, Portsmouth, NH
Whale Center of New England, Laura Howes, Gloucester, MA
The Ocean Alliance, Ian Kerr, Gloucester, MA
National Audobon Society Seabird Restoration Program, Steven Kress, Ithaca, NY
Coastal Research and Education Society of Long Island, Pres. Arthur Kopelman
The Great Whale Conservancy, Pres. Michael Fishback, Greensboro, NC

Party Boat and Whale Watch Companies:

Bunny Clark Deep Sea Fishing, Capt. Tim Tower, Perkins Cove, ME
Bar Harbor Whale Watch Company, Naturalist Zack Klyver, Bar Harbor, ME
Boothbay Whale Watch, Naturalist Mechele Vanderlaan, Boothbay Harbor, ME
Odyssey Whale Watch, Christopher Cutshall, Portland, ME
First Chance Whale Watch, Dwight Raymond, Kennebunkport, ME
Nor'easter Deep Sea Fishing, Capt. Michael Perkins, Kennebunk ME
Eastman's Dock Deep Sea Fishing and Whale Watching, Phil Eastman, Seabrook, NH
Lady Tracey Anne, Inc., and Lady Courtney Alexa, LLC, Mark Godfroy, Seabrook, NH
Atlantic Fleet Whale Watch, Capt. Brad Cook, Rye Harbor, NH
Granite State Whale Watch, Pete Reynolds, Rye Harbor, NH
Seven Seas Whale Watch, Paul Frontiero, Gloucester, MA
Clipper Fleet Fishing, Joe Grady, Salisbury, MA
Walsh's Deep Sea Fishing, Bob Walsh, Lynn, MA
Newburyport Whale Watch, Capt. Bill Neelon, Newburyport, MA
Yankee Fleet Deep Sea Fishing and Whale Watching, Tom Conley, Gloucester, MA
Cape Ann Whale Watch, Jim Douglass, Gloucester, MA
Capt. John Boats Whale Watching and Fishing Tours, Bob Avila, Plymouth, MA
Helen H Deep Sea Fishing, Capt. Joe Huckmeyer, Hyannis, MA
Dolphin Fleet Whale Watch, Jay Hurley, Eastham, MA
F/V Skipper, Capt. John Potter, Oak Bluffs, MA
Klondike IX, Capt. Pete Pearson, New Rochelle, NY

Commercial Fishing Vessels:

F/V Drew and Payton, Donald Simmons, Jr., Friendship, ME
F/V Vallerie J, Donald Simmons, Sr., Friendship, ME
F/V Outer Limits, Dustin Reed, Friendship, ME
F/V Amy Lynn, Gregory Simmons, Friendship, ME
F/V Heather and Isaac, Keith Simmons, Friendship, ME
F/V Mary Elizabeth, Ted Ames, Stonington, ME
F/V Deborah Ann, Chris Clark, Southwest Harbor, ME
F/V Hunter, Vaughn Clark, Southwest Harbor, ME
F/V Heather Rose IV, Gene Thurston, Southwest Harbor, ME

F/V Linda Sea, John Stanley, Southwest Harbor, ME
F/V CC & Water, Cookie Whitten, Winter Harbor, ME
F/V Sandra E, Allan Vitkus, Vinalhaven, ME
F/V Gulf Traveler, John Cotton, Tenants Harbor, ME
F/V Leslie and Jessica, Gary Libby and Larry Wood, Port Clyde, ME
F/V Ella Christine, Randy Cushman, Port Clyde, ME
F/V Bug Catcher, Gerry Cushman, Port Clyde, ME
F/V Capt. Lee, Justin Libby, Port Clyde, ME
F/V Lauren Dorothy, Edward Thorbjoursen, Port Clyde, ME
F/V Ruthless, Justin Thompson, Port Clyde, ME
F/V Two Toots, Mark Huntlay, St. George, ME
F/V Eliza B, Neil Cunningham, Boothbay Harbor, ME
F/V Three Bells, Mark Jones, Boothbay Harbor, ME
F/V Jazamataz, Don Page, Boothbay Harbor, ME
F/V Mary E, Jeff Norwood, Boothbay Harbor, ME
F/V Danny & Chad, Jody Murray, Boothbay Harbor, ME
F/V Don't Ask, Randy Durgan, Boothbay Harbor, ME
F/V Ella & Sadie, Colin Yentsch, Boothbay Harbor, ME
F/V Andrea J, Dave Fischer, Boothbay Harbor, ME
F/V Sully, Mathew Rice, Boothbay Harbor, ME
F/V Bottom Line, Carlton Yentsche, Boothbay Harbor, ME
F/V Intrapment, Rodney Lowery, Boothbay Harbor, ME
F/V No Respect, Michael Pinkham, Boothbay Harbor, ME
F/V Amy Gale, Caleb Hodgdon, Boothbay Harbor, ME
F/V Lion's Den, John Shostak, Boothbay Harbor, ME
F/V Julia G III, Bradley Simmons, Boothbay Harbor, ME
F/V Lady Esther, Larry Knapp, Boothbay Harbor, ME
F/V Johanna Marie, John Farnham, Boothbay Harbor, ME
F/V Lindsey P II, Dana Hodgdon, Boothbay, ME
F/V Suzanne B, David Norton, Boothbay, ME
F/V Bout Time, Andrew Kenny, Boothbay, ME
F/V Phyllis III, Jody Durgan, Boothbay, ME
F/V Arzetta Sue, Mark Lewis, Boothbay, ME
F/V Gratitude, Michael Stevens, Five Islands, ME
F/V Sheann and Jess, Chipper Preble, Five Islands, ME
F/V Miss Connie, Gregg Gilliam, Small Point, ME
F/V Heather Kate, Glen Gilliam, Small Point, ME
F/V Morning Starr, Herbie Yeaton, West Point, ME
F/V Allie K, Steve Simmons, Southport, ME
F/V Sea Strider, Marty Thibault, Southport, ME
F/V Mystic Rose, Michael Fossett, South Bristol, ME
F/V Elizabeth Jane, Clay Gilbert, South Bristol, ME
F/V Jeanne C, Kelo Pinkham, Trevett, ME
F/V High Roller, Steve Benner, Warren, ME
F/V Carol Ann, Gary Hatch, Owl's Head, ME
F/V Pamela Grace, Troy Bichrest, Cundys Harbor, ME
F/V GetSome, Jimmy Soto, Portland, ME
F/V Erin and Sarah, Peter Speeches, Portland, ME
F/V Bella & Bailey, Keith Jordan and Dean Gower, Portland, ME

F/V Endeavor, Marshall Spear, Portland, ME
F/V Bingham, William Smith, Portland, ME
F/V Stella Maris, Jessie Field, Portland, ME
F/V Hooker, Phil Chase, Portland, ME
F/V Julia & Carly, Joe Mazerolle, Portland, ME
F/V Longjack, Joel Strunk, Portland, ME
F/V Kathleen J, Stuart Fay, South Portland, ME
F/V Claudette C, Gary C., and Gary E. Obrien, South Portland, ME
F/V Kelly Anne, Keith Landrigan, South Portland, ME
F/V Banshee, John Harmon, South Portland, ME
F/V Belly Filla, Alex Notis, South Portland, ME
F/V Maria and Dorothy, Rob Odlin, Scarborough, ME
F/V Seldom Seen, Matt Weber, Monhegan Island, ME
F/V Arco Felice, Lexi Krausse, Rockport, ME
F/V OnLine, Geoff Pellicia, Scarborough, ME
F/V Molly Jane, Kurt Christianson, Pine Point, ME
F/V Valborg, Kirk Plender, Peaks Island, ME
F/V Zerlina, David Schalit, Brooklin, ME
F/V Misty Mae, Donald Paulson, Cushing, ME
F/V Scoot Too, Doug Gerry, Springvale, ME
F/V Old Mud, Donald Sproul, West Bath, ME
F/V Sea Wench, Capt. Kyle Gagne, Lyman, ME
F/V Theresa Ann, Tom Cassamassa, Saco, ME
F/V Angel III, Bruce Haskell, Saco, ME
F/V Mal-Max, Stephen Carlton and Zack Metcalf, Biddeford, ME
F/V Santiago, Ben Pasquale, Arundel, ME
F/V Hayley Ann, Joe Nickerson, Arundel, ME
F/V Megan Molly, Richard Willman, Jefferson, ME
F/V Pamala Jean, Adam Littell, Kennebunkport, ME
F/V Miss Nikki, Chris Angelos, Kennebunkport, ME
F/V Olympic Lady, Kurt Moses, Kennebunkport, ME
F/V Allyson, Capt. Thomas Mansfield, Kennebunkport, ME
F/V Pretender, Tad Miller, Kennebunk, ME
F/V Clover, Bill McIntire, Kennebunkport, ME
F/V Alana Marie, Paul Rioux, Kennebunkport, ME
F/V Emily Rachel, Tony Coleman, Wells, ME
F/V Eileen K, Mike Parenteau, Perkins Cove, ME
F/V A. Maria, Sonny McIntire, Perkins Cove, ME
F/V Amy Elizabeth, Matt Forbes, Perkins Cove, ME
F/V Buckwacka, Mike Horning, Perkins Cove, ME
F/V Elizabeth Ames, Chris Weiner, Perkins Cove, ME
F/V Josie B, Steve Merrill, Perkins Cove, ME
F/V All In, Michael Lorusso, Perkins Cove, ME
F/V Sara Beth, Kenneth Yorke, Perkins Cove, ME
F/V Queen of Peace, Shane and Bobby McIntire, Perkins Cove, ME
F/V Bettina H, Tim Virgin, Perkins Cove, ME
F/V Petrel, Micah Tower, Perkins Cove, ME
F/V Sticker Shock, Hank Greer, York Harbor, ME
F/V Rush, David Webber, York Harbor, ME

F/V Merlin, David Linney, York Harbor, ME
F/V Risky Business, Michael Ramsey, York Harbor, ME
F/V Sushi Hunter, Capt. Doug Anderson, Eliot, ME
F/V Fortunate, Jeremy Reynolds, Kittery, ME
F/V Sally G, Joe Barrone, Kittery, ME
F/V Endeavour, Emile Bussiere, Kittery, ME
F/V Maggie Grace, Thomas Allen, Kittery Point, ME
F/V Miss Guided, Paul Spencer, Rochester, NH
F/V Merilyn J, F/V Miss Ava, Ron Lien, Gilford, NH
F/V Cindy K, Bo Adams, Rochester, NH
F/V Sugar Bear, Capts. Silvio Balzano, Bruce Brennan, Garth Morin, and Mark Brambilla, New Castle, NH
F/V Pin Wheel, Tyler McLaughlin, Rye Harbor, NH
F/V Sea Hag, Arthur Splain, Rye, NH
F/V Penny B, James Bowles, Rye, NH
F/V Rough Times, Chris Adamitis, Portsmouth, NH
F/V Island Girl, Bob Bryant, Portsmouth, NH
F/V Pacifier, Michael McLaughlin, Rye, NH
F/V Zero Nine, Bill Boise, Rye, NH
F/V Thalasa, Charles Panasis, Dover, NH
F/V Julia G, Thomas and Ted Sutton, Hampton Harbor, NH
F/V Toby Ann, Brian Higgins, Gloucester, MA
F/V Bounty Hunter, Billy Monte, Gloucester, MA
F/V Coot, Dana Kangas, Gloucester, MA
F/V Tuna.com, Capt. Dave Carraro, Gloucester, MA
F/V Freebird, Gregg Swinson, Gloucester, MA
F/V American Heritage, F/V Kristania, Michael Leary, Gloucester, MA
F/V Ryan Zackary, F/V Rock On, F/V Lori B, Rich Burgess, Gloucester, MA
F/V JJ, Rick Pramas, Gloucester, MA
F/V Mary D, Daniel Doumani, Newburyport, MA
F/V The Gov, Mark Godfried, Gloucester, MA
F/V Christina, Kevin Leonowert, Gloucester, MA
F/V Gratitude, Eric Swanson, Gloucester, MA
F/V Jean Anne, Capt. Jules Boudreau, Gloucester, MA
F/V Susan C, Joe Jancewicz, Gloucester, MA
F/V Jeanne Marie, Mike Blanchard, Gloucester, MA
F/V Osprey, Steve Corbett, Gloucester, MA
F/V Katie May, Dean Holt, Newburyport, MA
F/V Sooner or Later III, John Nichols, Newburyport, MA
F/V Amanda, Peter Atherton, Newburyport, MA
F/V Karen Elain, Don and Craig Nelson, Salisbury, MA
F/V Merganser, Peter Fyrberg, Rowley, MA
F/V Ella Briggs, Dylan Caldwell, Pigeon Cove, MA
F/V James & Christine, Michael Cornell, Marblehead, MA
F/V Seven Sea, Bob Oulette, Danvers, MA
F/V Fishbucket, Capt. Mike Delzingo, Boston, MA
F/V Hookin-Up, Capt. Darin DiNucci, Winthrop, MA
F/V YA-HOO, Capt. Doug Brander, Hull, MA
F/V Lady Lyn, Capt. Bill Henderson, Hull, MA

F/V Jesse J, Capt. John Richardson, Hingham, MA
F/V Moonlighter, Mark Paolucci, Quincy, MA
F/V All Risk, Newton Johnson, Boston, MA
F/V Bad Influence, Capt. Tom Scanlon, Lynn, MA
F/V Bare Bone, Will and George French, North Andover, MA
F/V Hot Reels, Jeff Webber, Green Harbor, MA
F/V Caitlin Marie, Dave Cataldo, Green Harbor, MA
F/V Perfect C's, F/V Lisa Marie, Michael Pratt, Green Harbor, MA
F/V Fortunate, Frank Papp, Green Harbor, MA
F/V Soggy Dollar, Mike Buckley, Green Harbor, MA
F/V Ocean Runner, Brian Flannery, Green Harbor, MA
F/V Family Jules, Thomas Libertini, Green Harbor, MA
F/V Go Figueire, Capt. Jeremy Figueiredo, Green Harbor, MA
F/V Fish Stix, Capt. Claude S. Holt, Green Harbor, MA
F/V Akula, Jordan Sanford, Green Harbor, MA
F/V Finestkind, Dana Blackman, Green Harbor, MA
F/V Lady Pamela, Michael McNamara, Green Harbor, MA
F/V Hannah G, Steven Getto, Green Harbor, MA
F/V Bampy, Ralph Pratt, Green Harbor, MA
F/V Papaneil, Neil Chandler, Duxbury, MA
F/V Shadowline, Putnam Maclean, Marshfield, MA
F/V Iron Skippy, John Bunar, Duxbury, MA
F/V Sashamy, Capt. Doug Amorello and Jeff Amorello, Plymouth, MA
F/V Justified, Danny Hunter, Plymouth, MA
F/V Katie Marie, Nate Cavacco, Plymouth, MA
F/V Lorraine B, Capt. Bob Briggs, Scituate, MA
F/V Coyote, Scott Brady, Scituate, MA
F/V Mulberry Canyon, Capt. John Galvin, Quissett, MA
F/V Sea Wolf, Tom Smith, Orleans, MA
F/V Hindsight, Brett Wilson and Woddy Wood, Orleans, MA
F/V Last Resort, Dan Howes, Orleans, MA
F/V Tammy Rose, Capt. Corey Stewart, Orleans, MA
F/V Cynthia C, Tyler Macallister, Sandwich, MA
F/V Metal Health, Steven Pechinsky, Sandwich, MA
F/V Shocker, Herb Finley, Sandwich, MA
F/V Ezyduzit, F/V Rueby, William Chaprales, Sandwich, MA
F/V No Worries Too, Capt. Dick King, Westport, MA
F/V Blue Heron, Jonathan Geary, Chatham, MA
F/V Miss Rockville, Andrew Keese, Chatham, MA
F/V Saga, Ben Bergquist, Chatham, MA
F/V Horse Mackeral, David Gelfman, Chatham, MA
F/V Rug Rats, Bob St. Pierre, Chatham, MA
F/V Miss Fitz, John Our, Chatham, MA
F/V Ann Marie, Jim Nash, Chatham, MA
F/V Beggars Banquet, Bob Keese, Chatham, MA
F/V Never Enough, Bruce Kaminski, Chatham, MA
F/V Fairtime, Frank Sontoro, Chatham, MA
F/V Ouija, Gerald Miszkin, Chatham, MA
F/V Ocean Lady, Christopher Ripa, Chatham, MA

F/V Kittiwake, Ken Eldredge, Chatham, MA
F/V Edward & Joseph, Charlie Dodge, Chatham, MA
F/V Magic, Mike Abdow, Chatham, MA
F/V Frenzy, Ray Kane, Chatham, MA
F/V Wildwood, Nick Hyora, Chatham, MA
F/V Constance Sea, Mike Woods, Chatham, MA
F/V Lost, Nick Muto, Chatham, MA
F/V Dawn T, Stuart Tolley, Chatham, MA
F/V Bada Bing, Tye Vecchione, Chatham, MA
F/V Cuda, John Tuttle and William Barabe, North Chatham, MA
F/V Unicorn, Robert Eldredge, South Chatham, MA
F/V Riena Marie, Ted Ligenza, South Chatham, MA
F/V Yellowbird, James Eldredge, West Chatham, MA
F/V Luau, John and Mark Shakliks, Eastham, MA
F/V Anna Marie, Ray Brunelle, Eastham, MA
F/V Suzies Riches, Rich Whiteside, Barnstable, MA
F/V Tenacious II, Eric Hesse, Dennis, MA
F/V Alicia Ann, Greg Walinski, Dennis, MA
F/V Back Off, F/V Fighting Irish, Shawn Sullivan, Dennis, MA
F/V Hawk, Capt. Dennis Lanzetta, East Dennis, MA
F/V Lucky 7, Carl Coppenrath, South Dennis, MA
F/V Peggy B II, Ronald Braun, Harwich, MA
F/V Arlie X, Thomas Szado, Harwich, MA
F/V Sea Holly, Mark Leach, Harwich, MA
F/V Kelly J, Michael Terrenzi, Harwich, MA
F/V Zachary T, Nick O'Toole, Harwich, MA
F/V Sea Chase, Roscoe Chase, Harwich, MA
F/V Sea Hook, Earl LeGeyt, Harwich, MA
F/V Tricia Lynn, Glen LeGeyt, Harwich, MA
F/V Haywire, Chris Pistel, Harwich, MA
F/V Sue Z, Capt. Tom Traina, Harwich Port, MA
F/V Lilly Lulu, John Lashar, Harwich Port, MA
F/V Relentless, Mark Poirier, Harwich Port, MA
F/V Machaca, F/V Tormenta, Capt. Willy Hatch, Falmouth, MA
F/V Bank Runner, George Breen, Falmouth, MA
F/V Fish Hawk, Jeff Capute and Joe Weinberg, Hyannis, MA
F/V Predatuna, Dennis Chaprales, Hyannis, MA
F/V Lori Ann, Dorwin Allen, Hyannis, MA
F/V Sea Hawk, Carol Huckmeyer, Hyannis, MA
F/V Isabella H, Patrick Radford, Hyannis, MA
F/V Rachel M, Roy McKenzie, Hyannis, MA
F/V Gypsy, Tom Ryshavy, Hyannis, MA
F/V Cynthia C, Thedore Velsor and Todd Espindola, Mattapoisett, MA
F/V Inseine, Mike Lange, New Bedford, MA
F/V Knotty Girl, Andrew Eaves, New Bedford, MA
F/V Reality, James P. Ellis, Nantucket, MA
F/V Seas The Day, Kirby Jones, Nantucket, MA
F/V Althea K, Pete Kaizer, Nantucket, MA
F/V Quitsa Strider, Jonathan and Matt Mayhew, Chilmark, MA

F/V Unicorn, Greg Mayhew, Chilmark, MA
F/V Annalee, Annette Cingle, Chilmark, MA
F/V Wynott, Patrick Jenkinson, Chilmark, MA
F/V Megan and Haley, Jeff Lynch, Chilmark, MA
F/V Martha Elizabeth, Wes Brighton, Chilmark, MA
F/V Jenny J, Lev Wylodka, Chilmark, MA
F/V Sharon, Ann, Capt. Sean Egan, Chilmark, MA
F/V Tenacious, Capt. Rob Coad, Edgartown, MA
F/V Caroline, Alan Gagnon, Edgartown, MA
F/V Clean Sweep, Dan Gilkes, Edgartown, MA
F/V Surfside, Graham Murray, Edgartown, MA
F/V Short Fuse, Capt. Steve Purcell, Edgartown, MA
F/V Shearwater, Capt. Paul McDonald and Eli Bonnell, Menemsha, MA
F/V Dazed and Confused, Capt. Alex Friedman and Chris Jones, Oak Bluffs, MA
F/V Poco Loco, David Kadison, Oak Bluffs, MA
F/V Smokin Eel, Tom Norbury, Oak Bluffs
F/V Layla Ann, Stephen Morris, Oak Bluffs, MA
F/V Pogie Time, Eduard Begin, Tisbury, MA
F/V Solitude, Andy Wheeler, Vineyard Haven, MA
F/V Chum King, Jamie King, Vineyard Haven, MA
F/V Little Tunny, Capt. John Schillinger, Vineyard Haven, MA
F/V Diggin It II, Dan Zawisza, Old Saybrook, CT
F/V Destiny, Capt. Mike Deskin, Clinton, CT
F/V Susan H, Eric Herbst, Clinton, CT
F/V Tracings, Dan Weber, Old Saybrook, CT
F/V Scurge, Marty Hall, New London, CT
F/V Hot Tuna, Timothy Ott, Broad Channel, NY
F/V Miss Isabella, Ken Clark, Shelter Island, NY
F/V Going Deep, Tyler Clark, Shelter Island, NY
F/V Gannett II, Chip Edwards, Shelter Island, NY
F/V Moonshine, Spurge Krasowski, Brielle, NJ
F/V Lucky Lady, Walter Harmstead, Manasquan, NJ

Charter and Guide Companies:

Shark Six Sportfishing Charters, Capt. Barry Gibson, Boothbay Harbor, ME
Sweet Action Charters, Capt. Dan Wolotsky, Boothbay Harbor, ME
Breakaway Sportfishing, Capts. Pete and Nick Ripley, Boothbay Harbor, ME
Maine Saltwater Guide Service, Capt. Forrest Faulkingham, Wiscasset, ME
Sea Ventures Charters, Capt. Dave Sinclair, Wayne, ME
Asticou Charter Boat Co. Capt. Richard Savage, Northeast Harbor, ME
Kennebec River Fishing Charters, Capt. Chester Rowe, Bath, ME
Obsession Sportfishing Charters, Capt. Dave Pecci, Bath, ME
Marsh River Charters, Capt Hank DeRuiter, West Bath, ME
Captain Doug Jowett Charters, Capt. Doug Jowett, Brunswick, ME
Offshore Adventures Fishing, Capt. John Pappas, Cape Elizabeth, ME
Diamond Pass Outfitters, Capt. Luis Tirado, South Portland, ME
Atlantic Adventures Charters, Capt. James Harkings, Portland, ME
Teazer Charters, Capt. Pete Morse, South Portland, ME

Morning Flight Charters, Capt. Dave Paul, South Portland, ME
Kristin K Charters, Capt. Ben Gardner, South Portland, ME
Maine Coast Guide Service, Capt. Keith Hall, Scarborough, ME
Eggemogin Guide Service, Capt. Pete Douvarjo, Sedgwick, ME
Captain Doug Jowett Charters, Capt. Doug Jowett, Brunswick, ME
Maine River & Sea Charters, Capt. Mike Jancovic, Belgrade, ME
Jillian II Fishing Charters, Capt Richard Crosby, Buxton, ME
Live Wire Charters, Capt. Rick Hanlin, Sabattus, ME
Bass I Charters, Capt. Dean Krah, Newcastle, ME
Trina Lyn Fishing Charters, Capt. Todd Stewart, Old Orchard Beach, ME
Rippin' Lips Charters, Capt. Jim Bollinger, Old Orchard Beach, ME
Hook'd Up Fishing Charters, Capt. Garon Mailman, Saco, ME
Pritnear Heaven Charters, Capt. Dave Johnson, Camp Ellis, ME
Saco Bay Guide Service, Capt. Cal Robinson, Biddeford, ME
Libreti Rose Fishing Charters, Capt. Bruce Hebert, Kennebunkport, ME
Manta Ray Adventures, Capt. Jon Manter, Kennebunkport, ME
F/V Miss Megan II Charters, Capts. Shawn and Megan Tibbetts, Wells, ME
Nastashet Roads Charters, Paul R. Hood, Wells, ME
Lethal Weapon Charters, Capt. Bob Liston, Wells Harbor, ME
Capt. Satch & Sons Fishing, Capts. Satch, Den and Whit McMahon, Wells, ME
Yellow Boat Charters, Capt. Ben Weiner, Perkins Cove, ME
Bigger N' Better Sportfishing, Capt. Mike Sosik, York, ME
G Cove Charters, Capt. Greg Brown, York Harbor, ME
Clandestino Fishing Charters, Capt. Keper Connell, Rye, NH
Tontine Charters, Capt. Patrick Dennehy, Rye, NH
Captain Bill's Charters, Capt. Bill Wagner, Rye, NH
Melanie Jeanne Fisheries, LLC, Ralph McDonald, Exeter, NH
Cap'n Sav's Charters, Capt. Radziic, Rye, NH
Roof Rafta Fishing Charters, Capt. Patrick Colby, Hampton Harbor, NH
Shoals Fly Fishing & Light Tackle, Capt. Peter Whelan, Portsmouth, NH
Reel Job Fishing Charters, Capt. Steve Main, Hampton, NH
Kool-Aid Charters, Capt. Cody Dodds, Hanover, NH
Seacoast New Hamsphire Sportfishing, Capt. Bob Weathersby, Rye, NH
Rod's Delight Charters, Capt. Rod Ratcliffe, Salisbury, MA
Rings Island Charters, Capt. Gary Morin, Salisbury, MA
Rocky Point Fishing Charters, Capt. Bill Jarman, Newburyport, MA
Shadowcaster Charters, Capt. James Goodhart, Newburyport, MA
Merrimack River Charters, Capt. Bob Bump, Newburyport, MA
Atlantic Charter, Capt. Norm Boucher, Newburyport, MA
Summer Job Fishing Charters, Capt. Scott Maguire, Newburyport, MA
Erica Lee II Charters, Lee, Bob and Erica Yeomans, Newbury, MA
Kelly Ann Charters, Capt. Mauro DiBacco, Rowley, MA
Sigler Guide Service, Capt. Randy Sigler, Marblehead, MA
Tuna Hunter Fishing Charters, Capts. Gary and Karen Cannell, Gloucester, MA
Sweet Dream Sportfishing III, Capt. Bruce Sweet, Gloucester, MA
Sandy B Charters, Capt. Bruce Bornstein, Gloucester, MA
Full Strike Anglers, Capt. George Lemieux, Gloucester, MA
Kayman Charters, Capt. Kevin Twombly, Gloucester, MA
Karen Lynn Charters, Capt. Collin MacKenzie, Gloucester, MA

North Coast Angler, Capts. Skip Montello, Dave Beshara and Al Montello, and Instructor Stephen Papows, Rockport, MA
Purelife Charters, Capt. Jay Shields, Beverly, MA
Sheila D Charters, Capt. Arthur Caissie, Danvers, MA
Law & Order Charters, Capt. Pete Murphy, Scituate Harbor, MA
Charter Vessel Ghillie, Capt. Charlie Wade, Marshfield, MA
Crimson Tide Charters, Capts. Fred Lavitman and Chris Joyal, Marshfield, MA
White Cap Charters, LLC, Capt. Brad White, Marshfield Hills, MA
CPF Charters, Capt. Mike Pierdnock, Brant Rock, MA
F/V Top Shelf Charters, Capt. Jim Gilpin, Norwell, MA
Massachusetts Bay Guides, Capts. Greg, Taylor and Bryan Sears, Corey Carlson, Don Campbell, Dave and Ed Newell, and Dave Kraus, Green Harbor, MA
Big Fish Charters, Capt. Tom Depersia, Green Harbor, MA
Relentless Charters, Capts. Dave Waldrip, Jeremiah Mulcahy and Curtis Maxon, Green Harbor, MA
F/V Typhoon Charters, Andrew Marshall, Green Harbor, MA
Black Rose Fishing Charters, Capt. Rich Antonino, Green Harbor, MA
Enoch Charters, Capt. Jay Berggren, Scituate, MA
White Cap Charters LLC, Capt. Brad White, Scituate, MA
Capt. Tim Brady & Sons Charters and Tours, Capt. Tim Brady, Plymouth, MA
Reel Time Fishing Charters, Capt. Roland Lizotte, Plymouth, MA
Go Fish Sportfishing Charters, Capt. Patrick Helsingius, Sudbury, MA
Bill & Jules Fishing, Capt. Bill Bryant, Brockton, MA
Little Sister Charters, Capt. Jason Colby, Quincy, MA
Black Hull Charters, Capt. Ronnie Munafo, Quincy, MA
Midnight Charters, Capt. Roger Brousseau, Quincy, MA
Boston Fishstix Guides, Capts. John Mendelson and Rich Armstrong, Quincy, MA
Ave Maria Charters, Capt. Mike Bousaleh, Braintree, MA
Boston Fishing Charters, Kateiri Bousaleh, Braintree, MA
Reel Pursuit Charters, Capt. Paul Diggins, Boston, MA
BigTips Charters, Capt. Edward Manning, Boston, MA
CJ Victoria Charters and Rod Building, Capt. Rob Savino, Winthrop, MA
City Slicker Charters, Capt. John Wallace, Winthrop, MA
Beth Ann Charters, Capt. Rich Wood, Provincetown, MA
Fin Addicition Charters, Capt. Jeff Smith, Wellfleet, MA
Chatham Charters, Capt. Matt Swenson, Chatham, MA
Capeshores Charters, Capt. Bruce Peters, Eastham, MA
Roxy Charterboat, Capt. Thomas Hayes, Eastham, MA
F/V Miller Time, Charles Miller, Eastham, MA
F/V Gusto, Jonah Turner, Eastham, MA
F/V Fairlady, Matthew Bettencourt, Eastham, MA
Castafari Charters, Capt. Damon Sacco, Falmouth, MA
Sea Dog Sportfishing, Capt. Bruce Cranshaw, Falmouth, MA
F/V Sea Frog, J. Roger Tessier, Harwich, MA
Fishtale Sportfishing, Capt. Mort Terry, Harwich Port, MA
Cape Cod Charter Fishing, Capt. Art Brosnan, Saquatucket Harbor, MA
Laura Jay Charters, Capts. Don and Jay Cianciolo, East Sandwich, MA
Liberty Fishing Charters, Capt. Martin Costa, Orleans, MA
F/V Hobo, Andy Napolitano, Orleans, MA

F/V Fair Lady, Chuck Catalou, Orleans, MA
F/V Osprey, Don Viprino, Orleans, MA
F/V Rose Pengelly, John Avellar, Orleans, MA
F/V Stunmei II, Walter Farrell, Orleans, MA
Bluefin Charters, Capt. Brian Courville, Falmouth, MA
Southside Charters, Capt. Todd Bialas, Falmouth, MA
Cape Cod Sportfishing - Janine B, Capt. Wayne Bergeron, Dennis, MA
Striper Charters, Capt. Gary Swanson, South Yarmouth, MA
Stray Cat Sportfishing, Capt. Ron Murphy, Hyannis Harbor, MA
F/V Angler, Jason Alger, Hyannis, MA
Breakwater Charters, Capt. Mike Conly, Marthas Vineyard, MA
Tomahawk Charters, Capt. Buddy Vanderhoop, Aquinnah, MA
Capt. Clarke Charters, Capt. Jennifer Clarke, Chilmark, MA
North Shore Charters, Capt. Scott McDowell, Chilmark, MA
Contessa Fly Fishing, Capt. W. Brice Contessa, Edgartown, MA
Jean Marie Fishing Charters, Capt. John Crocker, Edgartown, MA
High Tides Charter & Guide Service, Capt. Russ Lawrence, Edgartown, MA
Wayfarer Charters, Capt. Ed Jerome, Edgartown, MA
Great Harbour Charters, Capt. Charlie Ashmun, Edgartown, MA
Featherwedge Charters, Capt. Nick Warburton, Menemsha, MA
Sortie Charters, Capt. Alex Preston, Menemsha, MA
Capt. Bucky Burrows Charters, Capt. Bucky Burrows, Vineyard Haven, MA
Done Deal Charters, Capt. Jeffrey Canha, Vineyard Haven, MA
Martha's Vineyard Fishing Charters, Capt. Dick Vincent, Vineyard Haven, MA
Topspin Charters, Capt. Karsten Reinemo, Nantucket, MA
Nantucket Sportfishing Co., David Martin, Nantucket, MA
F/V Just Do It Too, Capt. Marc Genthner, Nantucket, MA
Herbert T. Sportfishing, Fred Tonkin, Nantucket, MA
Snapper Charters, Capt. Doug Lindley, Nantucket, MA
Monomoy Charters & Critter Cruise, Capt. Josh Eldridge, Nantucket, MA
West Wind Fishing Charters, Capt. Bob Rank, Nantucket, MA
Albacore Charters, Capts. Bob DeCosta and Smitty Smith, Nantucket, MA
Capt. Tom's Charters, Capts. Tom Mleczko, Nat Reeder, Jason Mleczko, and Colin Sykes, Nantucket, MA
Tide Hunter Charters, Capt. Scott Bradley, Stoughton, MA
Get The Net Charters, Capt. Nat Chalkey, Woods Hole, MA
Riptide Charters, Capt. Terry Nugent, Buzzards Bay, MA
F/V The Kid$ Money Charters, Capt. Bob McCarey, Bourne, MA
Diablo Sportfishing, Capt. Kevin Malone, Pocasset, MA
Lincoln Brothers Fishing Charters, Capts. Sam and Josh Lincoln, Pocasset, MA
Race Point Charters, Capt. Christopher Long, Sesuit Harbor, MA
Slamdance Charters, Capt. Steve Moore, Barnstable, MA
Busy Line Charters, Capt. Norm Bardell, Galilee, RI
Cherry Pepper Sportfishing, Capt. Lin Safford, Charlestown, RI
Reel to Reel Charters, LLC, Capt. Scott Lundberg, Narragansett, RI
Maverick Charters, Capt. Jack Riley, Hope Valley, RI
Coastal Charters Sportfishing, Capt. Dom Petrarca, Portsmouth, RI
Flaherty Charters, Capt. Tim Flaherty, Middletown, RI
After You, Too, LLC, Capt. Frank Blume, New London, CT

Togfather Fishing, Dennis Cataldo, Farmingdale, NY
Double Diamond Charters, Capt. Manuel Canales, Neptune, NJ
Tuna Wahoo Charter Fishing, Capt. Rich Adler, Point Pleasant, NJ
Shark Inlet Charters, Capt. Mike Formichella, Belmar, NJ
Midcoast Kayak Fishing, Bryan Rusk, Easton, MD
Canyon Runner Fishing Charters, Adam LaRosa, Pirate's Cove, NC
Sushi Sportfishing, Capt. Charley Pereira, Pirate's Cove, NC
F/V Reel Therapy, Bob Memmen, Jupiter, FL

Tackle Shops and Companies:

Saco Bay Tackle, Peter Mourmouras, Saco, ME
Tightlines Tackle, Dave Mason, Walpole, ME
Luke's Reel Repair, Lionel Lucas, Kennebunk, ME
Webhannet River Boatyard and Tackle Shop, Capt. Scott Worthing, Wells, ME
Eldredge Bros. Fly Shop, Jim Bernstein, Cape Neddick, ME
White Anchor Bait & Tackle Shop, Carl Jordan, Boothbay, ME
Offshore Marine Outfitters, Matt Nagy, York, ME
Jeff's Bait Shop, Jeff Roberts, Lovell, ME
Bucko's Parts and Tackle, Michael J Bucko, Fall River, MA
Fisherman's Outfitter, John White, Gloucester, MA
First Light Anglers, Nat Moody and Derek Spingler, Rowley, MA
Offshore Pursuits Premium Tackle, David Dodsworth, MA
Fishing Finatics, Pete Santini, Everett, MA
Green Harbor Bait and Tackle, Bob Pronk, Marshfield, MA
Crossroads Bait and Tackle, Michael Hogg, Salisbury, MA
Antique Lures, Marty McGovern, Whitman, MA
Fore River Bait and Tackle, Rick Newcomb, Quincy, MA
Arthur's Custom Rods, Arthur Kaplan, Quincy, MA
Bigfish Tackle Co., Lawrence Wentworth, Hanover, MA
MBG Tackle, Capt. Bryan Sears, Scituate, MA
Belsan Bait and Tackle, Pete Belsan, Scituate, MA
Squid Bars, Co., Capt. Taylor Sears, Greenbush, MA
Offshore Innovations Inc., and Next Day Bait, Kevin Glynn, Falmouth, MA
The Hook-Up Bait and Tackle, Capt. Eric Stewart, Orleans, MA
Nelson's Bait and Tackle, Provincetown, MA
Sportsman's Landing, Dennis, MA
Sunrise Bait and Tackle, Gerald Armstrong, Harwich, MA
Powderhorn Outfitters, Jeff Lubin and Andy Little, Hyannis, MA
RonZ Mfg. Co., Ron Poirier, Brewster, MA
Wally's Wood Lures, Walter Morris, Sandwich, MA
Manny's Tackle, Capt. Don Fillman, Sandwich, MA
Riverview Bait and Tackle, Lee Boisvert, Yarmouth, MA
Nantucket Tackle, Arthur Quinn, Nantucket, MA
Bill Fisher Tackle, Corey and Cameron Gamiill, Nantucket, MA
Coop's Bait and Tackle, Cooper and Lela Gilkes Edgartown, MA
Larry's Bait and Tackle, Steve Purcell, Colin Floyd, Hulian Peppas and Ron Domurat, Edgartown, MA
Dick's Bait and Tackle, Oak Bluffs, MA

Cardinal Bait and Tackle, Michael Cardinal, Westerly, RI
RI Poppers, Armand Tetreault, Woonscket, RI
Point Jude Lures, Joe Martins, Newport, RI
River & Riptide Anglers, Capt. David Porreca, Coventry, RI
JB Tackle Co., Kerry and Kyle Douton, Niantic, CT
The Fish Connection, Capts. Joe and Jack Balint, Preston, CT
Fisherman's World Tackle, Rick Mola, Norwalk, CT
River's End Tackle, Pat Abate, Old Saybrook, CT
Hillyer's Tackle, Matt and Jon Hillyer, Waterford, CT
Aquaskinz Corp., Kadir Aturk, Lindenhurst, NY
BFG Tackle, Capt. Chuck Fisher, Dundalk, MD
South Chatham Tackle, Inc., Bob Earl, Sanford, NC
Cox Custom Tackle, Lee Cox, Raleigh, NC
Laceration Lures, LLC, Joey Massey, Raleigh, NC

Ecotourism Companies:

Lulu Lobster Boat Ride, Capt. John Nicolai, Bar Harbor, ME
Downeast Nature Tours, Owner/Guide Michael Good, Bar Harbor, ME
Aquaterra Adventures Sea Kayaking, David Legere, Bar Harbor, ME
Coastal Kayaking Tours, Owner/Guide Glenn Tucker, Bar Harbor, ME
Port Clyde Lobster Tours & Adventures, Kim Libby, Port Clyde, ME
Downeast Windjammer Cruises, Cranberry Cove Ferry Co., and Bar Harbor Ferry Service, Capt. Steven Pagels, Columbia Falls, ME
Old Quarry Ocean Adventures, Capt. Bill Baker, Stonington, ME
River Run Tours, Inc., Capt. Ed Rice, Bath, ME
Kayak Excursions, Stefan Kuenzel, Kennebunkport, ME
The Gift Sailing Cruises, Capt. Steve Perkins, Perkins Cove, ME

Businesses, Publications, and Others:

Dysart's Great Harbor Marina, Ed Dysart, Southwest Harbor, ME
Marine Systems Custom Boats, Eric Clark, Southwest Harbor, ME
Barnacle Billy's Inc., Bill Tower, Ogunquit, ME
Skipper Fisheries, Roger Libby, Port Clyde, ME
R & B Fisheries, Betty Libby, Port Clyde, ME
Port Clyde Fresh Catch, Alicia Morris and Kelly Eisler, Port Clyde, ME
Spencer For Hire, Capt. Bill Spencer, Boothbay Harbor, ME
Cavers Marine, Rick Cavers, South Paris, ME
Navtronics Marine Electronics, Tim Greer, York, ME
Redman Marine Fabricators, Noell Redman, York, ME
Underdog, LLC, Jeffrey Douglas, Kennebunkport, ME
Thomas & Lord Builders, Kevin Lord, Kennebunk, ME
Hanson Wood Turning, LLC, Steve Hanson, Kennebunkport, ME
Estes Oil and Propane, Mike Estes, York, ME
William Ross Design, William Ross, York, ME
Kittery Point Boat Builders, LLC, Eliot, ME
MGX, LLC, Kittery Point, ME
D & J Fuels, North Berwick, ME

Kittery Point Yacht Yard, Corp., Kittery, ME
Blunas, LLC, Ogunquit, ME
J River Skiffs, Dan Horning, Cape Neddick, ME
M/Y Shogun, Capt. Mike Finnegan, Edgecomb, ME
LaJoie Brothers, John LaJoie, Augusta, ME
Sturtivant Island Tuna Tournament, Pres. Phil Grondin, ME
Great Bay Aquaculture, George Nardi and Gennaco, Portsmouth, NH
Sanders Lobster, Jeff Sanders, Portsmouth, NH
Portsmouth Scuba, Jay Gingrich, Portsmouth, NH
Seaport Fish, Rick Pettigrew, Rye NH
Ray's Seafood, Andrew Widen, Rye, NH
J & K Fisheries, Jason Driscoll, Rye, NH
Sea View Lobster Corp, Michael Flanigan, Rye, NH
Petey's Restaurant, Peter Aikens, Rye NH
Shoals Bait Pens and Harpoons, LLC, Ritchie White, Rye, NH
New Hampshire Precision Metal Fabrication, Inc., Londonderry, NH
JC Boat, Jack Cadario, Brookline, NH
Boatwise, LLC, Capt. Rick Kilborn, South Hampton, NH
North Atlantic Marine Service, Steve McNally, Amesbury, MA
NewEnglandSharks.com, Capt. Tom King, Scituate, MA
Captain Mike Sawyer, S.P., Plymouth, MA
Boston Big Game Fishing Club, Marshfield, MA
Maguro America, Inc., Robert Fitzpatrick, Chatham, MA
Nantucket Fish Co., Pres. Andrew Baler, South Dennis, MA
Chatham Pier Fish Market, Chatham, MA
North Atlantic Traders, Ltd., Bob Kliss, Lynn, MA
Hy-Line Cruises, Gerald Poyant, Hyannis, MA
Menemsha Texaco, Marshall and Katie Carroll, Menemsha, MA
Neptune Marine Service, Justin Wall, Brewster, MA
Brant Point Marine, Bill Davidson, Nantucket, MA
Nantucket Seafoods, Dan Lemaitre, Nantucket, MA
Michaelangelo & Son, Michael Cannistrarro, Marston Mills, MA
Island Taxidermy and Wildlife Studio, Janet Messineo, Martha's Vineyard, MA
The Fisherman's Line, Bob Rogers, Assonet, MA
Tri-State Fishing Tournaments, Steve Mantia, Carver, MA
Vineyard Blues, Peter Oneil, Worcester, MA
Okuma Reels and Yeti Coolers, Mnfct. Rep. Mike Batta, West Barnstable, MA
On The Water Magazine, Publisher Chris Megan, East Falmouth, MA
Poon Harpoons, Falmouth, MA
New England Farm Union, Pres. Annie Cheatham, Shelburn Falls, MA
Crestar/The Frame Factory, Jason Dittelman, East Greenwich, RI
Compass Seafoods, LLC, Patrick Mead, Charlestown, RI
Bert's Boats, LLC, Robert Fanella, Narragansett, RI
Laptew Productions, Mike Laptew, North Kingstown, RI
Fred C. Church Insurance, Lowell, MA
Stripersonline.com, Tim Surgent, Wall, NJ
Fisherman's Post, Publisher Gary Hurley, Wilmington, NC

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON DC INTERNATIONAL

RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

June 4, 2012

Captain Paul J Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill 2
Newburyport, MA 01950
HerAmendment5@noaa.gov

RE: Comments on Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP) and Draft Environmental Impact Statement (DEIS) (No. 20120104)

Dear Captain Howard,

We are writing on behalf of the Herring Alliance[1] to provide comments on Amendment 5 to the Atlantic Herring FMP and its DEIS. The transition of this fishery to one dominated by industrial-scale fishing vessels demands a carefully implemented set of parallel changes to the fishery's conservation and management measures in order to protect the Northeast Shelf's forage base, including target (Atlantic herring) and non-target (river herring and shad) species caught in the fishery. Of particular concern to the Herring Alliance are river herring and shad which, due to the existing fragmented management approach for these species, are without any meaningful regulations in federal waters. This has contributed to the severely depleted status of these keystone species and left them in dire need of conservation and management.[2]

Fundamental changes are required to improve catch monitoring, reduce bycatch/incidental catch, and establish catch limits for non-target species caught in the fishery. The Herring Alliance recommends approval of the following final measures for inclusion in Amendment 5:

- Require dealers to accurately weigh and report all catch **(Section 3.1.5 Option 2).**
- Require 100% Observer Coverage on Category A & B vessels, with industry funding coverage that NMFS does not fund. **(Section 3.2.1.2 Alternative 2 & Option 2).**

[1] The Herring Alliance includes 52 organizations representing nearly 2 million individuals. The Herring Alliance is concerned about the Atlantic coast's forage fish (e.g., Atlantic herring, menhaden, and mackerel, river herring and shads, butterfish, and squids), that play a critical role in the food web as prey to a large number of predators, many of which support valuable recreational and commercial fisheries. A current list of members is attached to this letter.

[2] The 2012 river herring stock assessment and its peer review concluded that river herring are depleted, that ocean catch is an issue, and that they require fisheries management. *See* Stock Assessment Report No. 12-02 of the ASMFC *Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review,* at 8, available at: http://www.asmfc.org/meetings/2012SpringMtg/ShadandRiverHerringManagementBoard_2.pdf. Similarly, the 2007 the American Shad stock assessment and peer review concluded that shad populations have been declining in abundance for years, are not recovering, and are in need of management actions addressing fishing impacts to the species. *See* Stock Assessment Report No. 07-01 of the ASMFC *Terms of Reference and Advisory Report to the American Shad Stock Assessment Peer Review (2007)* at 19, available at: http://www.asmfc.org/.

- Establish an accountability system that discourages wasteful dumping of catch, including a fleetwide limit of five "slippage" events for each herring management area, after which slippage events would require a return to port **(Section 3.2.3.4 Option 4D).**
- Establish an immediate catch cap on the total combined amount of river herring and shad caught in the Atlantic herring fishery **(Modified Section 3.3.5** with cap amounts based on the median 3 or 5 year annual river herring and shad catch by area, with a provision for updating the cap based on new scientific information (through specifications)).
- Add river herring and shad as "non-target stocks in the fishery" **(Modified Section 3.3.5** with immediate initiation of an action to establish the status determination criteria and other required management measures).
- Close River Herring Protected Areas ("hotspots") to directed herring fishing **(Section 3.3.3.2.1 Option 1**, modified to allow for a future expansion of these hotspots through a Framework Adjustment to the larger "River Herring Monitoring/Avoidance Areas" if appropriate **(Section 3.3.4)).**
- Ban mid-water trawling in closed areas established to promote rebuilding of groundfish populations **(Section 3.4.4 Alternative 5).**

Detailed comments on these and additional management measures are provided below. Where modifications to proposed alternatives are recommended, the modification is noted.

Thank you for considering these comments.

Sincerely yours,

/s/ Roger Fleming
Roger Fleming, Attorney
Erica Fuller, Attorney
Earthjustice

Detailed Herring Alliance Comments

Section 3.3 Management Measures to Address River Herring Catch

The Council and NMFS are legally obligated to add river herring and shad to the Atlantic herring fishery management plan. *See Flaherty v. Bryson*, 2012 WL 752323, *13 (D.D.C. Mar. 8, 2012). Until they are added to the plan with fully implemented status determination criteria and other legally required measures, the Council must take immediate action to decrease the incidental catch of river herring and shad in the Atlantic herring fishery. *Id.* at *16. These measures must be accompanied by the application of a robust monitoring program with 100% at-sea monitoring and a system to control dumping. In addition to adding river herring and shad as stocks in the fishery to the Atlantic Herring FMP (discussed further below), the Herring Alliance supports the following alternatives as interim measures to reduce incidental catch of river herring and shad:

1. **Until River Herring and Shad are Fully Integrated into the FMP the Council Must Establish a River Herring and Shad Catch Cap**

The Herring Alliance supports a modified Alternative Section 3.3.5, which currently reads:

- Section 3.3.5: The Council will consider establishing a river herring catch cap for the Atlantic herring fishery as one of the several potential measures to reduce bycatch.

This alternative should be modified to implement an immediate cap for all alosines (river herring and shad, or "River Herring") based on the 3 or 5 year median annual river herring and shad catch by management area, with a provision for updating the cap based on new scieutific information as it becomes available (through specifications). The Amendment 5 record and DEIS fully supports approval of this modified alternative, and the Council has the authority and the legal obligation to initiate this cap immediately. *See Flaherty v. Bryson,* 2012 WL 752323 at *16 ("to meet their responsibility to ensure compliance with the National Standards, Defendants must demonstrate that they have evaluated whether the FMP or amendment minimized bycatch to the extent practicable.").

Amendment 5 has been developed to address the widely recognized need to reduce bycatch in the Atlantic herring fishery and specifically identified River Herring catch as a key issue to be addressed.[3] River Herring are caught, killed, and either landed or discarded in federally managed waters between 3 and 200 miles from shore by vessels in the Atlantic herring fishery. Although the majority appears to be landed and sold with Atlantic herring and mackerel, there are no meaningful federal regulations under any fishery management plan that manages this catch. The Council must take responsibility for this unmanaged mortality in the herring fishery and approve measures that will improve monitoring, reduce bycatch/incidental catch, and establish catch caps/limits for these species, especially for the Category A and B vessels that catch the vast majority of River Herring and realize the vast majority of the revenue in this fishery.

[3] *See* 74 Fed. Reg. 68577 (Dec. 28, 2009).

The Herring Alliance previously requested a catch cap for River Herring.[4] As noted by the PDT report referenced below, catch caps are often based on recent catch history when it is determined not to use an existing stock assessment for establishing a catch limit or one is not available. A catch cap is necessary to provide a strong incentive to avoid River Herring and help to minimize its overall catch. For guidance on various analyses, please see the document prepared for the Atlantic Herring PDT entitled *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery*[5] and contained in Volume II of the DEIS for Amendment 5, particularly Table 4 which provides Sub-Options for River Herring Catch Triggers by Area.

2. **Until River Herring are Fully Integrated into the FMP the Council Must Implement Hotspot Closures**

The New England Council has identified a variety of "River Herring Protection Areas" (relatively small) and "River Herring Monitoring/Avoidance Areas" (larger) in Amendment 5 as areas where river herring interactions are high. As an immediate interim measure until river herring and shad ("River Herring") are fully integrated into the FMP, herring vessels should be excluded from the River Herring Protection Areas. With modifications, the Herring Alliance supports Alternative Sections 3.3.3.2.1 and 3.3.4.

- Section 3.3.3.2.1: Option 1 Closed Areas: Prohibit directed fishing for herring in the areas/times that are identified as River Herring Protection Areas.

Alternative Section 3.3.3.2.1 should be modified to clarify that "directed fishing for herring" in these closures means herring permitted vessels fishing for, possessing, catching, transferring or landing more than 2,000 pounds of herring from the River Herring Protection Areas on all fishing trips. In addition, it should be modified to reflect that Category C & D permits will not be affected by these closures if not carrying gear capable of catching Atlantic herring.

Although the Herring Alliance supports the closures identified, it is opposed to the sub-option which allows a vessel to "declare out of the fishery" because it provides a loophole for limited access herring vessels to avoid having to comply with the Closed Areas prohibition. Alternatives 3.3.3.2.1 and 3.3.3.2.3 already provide appropriate exemptions, although the exemptions under 3.3.3.2.1 should be clarified to include vessels not fishing with mesh gear (e.g. hook and line). If adopted, this is an area where the New England Council and the Mid-Atlantic Council should coordinate their actions in Amendment 5 and Amendment 14 so that all small-mesh gear types capable of catching River Herring are prohibited from fishing in the closed areas regardless of the target species.

- Section 3.3.4: Mechanism for Adjusting/Updating River Herring Areas

Because the hotspots closed under Alternative 3.3.3.2.1 are relatively small, the Council should also approve Section 3.3.4 which allows for future expansion or modification, through a Framework Adjustment. The closure of larger "River Herring Monitoring/Avoidance Areas"

[4] *See* January 21, 2011 Letter from Herring Alliance to Executive Director NEFMC re: Capping River Herring Catch in the Atlantic Sea Herring Fishery.
[5] *See* Amendment 5 DEIS, Volume II, Appendix VII, at pp. 362-376.

should be considered as well as other areas if justified through further analyses, including data from 100% monitoring of the fishery. Based on various analyses provided in Volume II of Amendment 5 DEIS, closing the protection areas will help to minimize bycatch of river herring and shad populations in the short-term; however, the distribution of these species is likely too variable for these small closed areas to be effective, especially standing alone, in the long-term. **The Herring Alliance opposes the trigger-based closures under this alternative because the Council should not limit its application of a robust monitoring program to those limited areas for the vessels catching most of the fish in this fishery.** Category A and B vessels must be monitored robustly at all times and in all areas, including through 100% monitoring with a system to control at-sea dumping, not just in river herring hotspots. Further, because herring and mackerel are often targeted by the same vessels at the same time, the Council should coordinate these closures with the Mid-Atlantic Council to ensure consistency.

3. The Council Can Not Rely on a Voluntary Bycatch Avoidance Program such as the SFC/SMAST/DMF Project described in Alternative 3.3.2.2.4 to Satisfy its National Standard 9 Obligation to Minimize Bycatch

Any bycatch avoidance program, such as the SFC/SMAST/DMF Project described in Alternative 3.3.2.2.4, a University based voluntary program, is inappropriate as a regulatory measure and would be ineffective without a mortality cap. This alternative contemplates a "stand-alone approach for river herring bycatch" and should be removed from consideration in Amendment 5. There are simply no meaningful incentives to avoid bycatch through the program without a cap. Any positive results from the program to date are the result of the incentive to avoid meaningful regulation through this amendment, and will likely disappear as soon as Amendment 5 passes. The bycatch avoidance program for the Atlantic scallop fishery is successful at reducing bycatch only because there is a yellowtail flounder cap that scallop fishermen must avoid to continue fishing.

4. The Council Must Add River Herring and Shad to the Atlantic Herring FMP

The Magnuson-Stevens Act requires federal FMPs to describe the fish stocks involved in a fishery, and NMFS and the councils to manage those stocks in need of conservation and management.[6] FMPs must contain conservation and management measures consistent with the National Standards, including National Standards One and Nine which require management

[6] The Magnuson-Stevens Act requires an FMP or an amendment for those fisheries requiring "conservation and management." *See* 16 U.S.C. §§ 1852(h)(1); 1853(a)(2). For purposes of determining which target and non-target stocks require conservation and management, the Act provides a definition of "conservation and management" at 16 U.S.C. § 1802(5). *Id.* at *1, FN3. This definition should be looked to for guidance in making decision about what stocks belong in a FMP, and refers to rebuilding, restoring, or maintaining "any fishery resource and the marine environment," assuring among other things, a food supply, recreational benefits, and avoiding long-term adverse effects on fishery resources and the marine environment. National Standard 7 guidelines include a set of criteria for determining whether a fishery needs management that tracks this statutory definition and other MSA objectives and requirements, including examination of the condition of the stock or stocks of fish. The criteria also note that "adequate" management by an entity like the ASMFC could be one factor in determining whether a stock should be added to a fishery. In this case, although ASMFC management was noted by NMFS during briefing the *Flaherty v. Bryson* case, the Court did not address it in its opinion because (as even NMFS recognized) the ASMFC plan does not address federal waters.

measures that prevent overfishing and minimize bycatch.[7] The Act also requires annual catch limits (ACLs) and accountability measures (AMs) for *all* stocks in the fishery.[8] The National Standard One Guidelines require councils to identify the stocks in the fishery, including non-target stocks caught incidentally and retained or discarded at sea.[9] A stock can be identified in more than one fishery.[10] Identification as a stock in the fishery triggers ACL requirements and the standard approach to setting ACLs contained in the National Standard 1 Guidelines.[11] NMFS must review council decisions to ensure that they comply with the Act, and disapprove those that do not. *See* 16 U.S.C. § 1854(a).

The question of which stocks must be included in the Atlantic herring FMP was recently addressed in federal court. *See Flaherty,* 2012 WL at *13 (holding that the Magnuson-Stevens Act requires Councils to prepare an FMP or amendment for any stock of fish that "requires conservation and management."). Councils must make two determinations: (1) which stocks can be treated as a unit for purposes of management, and therefore should be considered a fishery, and (2) which of these fisheries then "require conservation and management." *Id.* at *9. The law does not allow managers to unreasonably delay decision-making regarding the appropriate composition of a fishery given their statutory obligations to ensure that overfishing does not occur. *Id.* at *12. The court also rejected any interpretation of the National Standard One Guideline found at 50 C.F.R. § 600.310(d)(1), as providing the Council with unreviewable discretion to determine what stocks belong in an FMP. *Id.* The Court held that while the Council's role is to name the species to be managed "in the first instance," NMFS has a duty "in the second instance" to ensure an FMP, including the composition of its fishery, satisfies MSA requirements. *Id.* at **13, 14. Moreover, Councils and NMFS cannot limit the stocks they include in a fishery to just those stocks that already happen to be part of an FMP, or those they have officially designated as overfished (or where overfishing is occurring). *Id.* at **12-14.

Thus, binding precedent makes clear that stocks in need of conservation and management must be added to an FMP. A decision by this Council to wait for a specific remedy order in the

---

[7] 16 U.S.C. § 1851(a)(1) & (9).

[8] *Id.* § 1853(a)(15).

[9] 50 CFR § 600.310(d)(3), (4). A "fishery" is defined as "one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics." *Id.* § 1802(13). A "stock of fish" is defined as a "species, subspecies, geographical grouping, or other category of fish capable of management as a unit." *Id.* § 1802(42). The National Standard One Guidelines provide additional guidance on the classification of the stocks in an FMP. *See* 50 C.F.R. § 600.310(d)(1) ("Magnuson-Stevens Act section 303(a)(2) requires that an FMP contain, among other things, a description of the species of fish involved in the fishery. The relevant Council [in the first instance] determines which specific target stocks and/or non-target stocks to include in a fishery" consistent with the Act's requirements. *See Flaherty v. Bryson,* 2012 WL 752323, *14. The regulations define "target stocks" as "stocks that fishers seek to catch for sale or personal use, including 'economic discards' as defined under Magnuson-Stevens Act section 3(9)," and "non-target species" and "non-target stocks" as "fish caught incidentally during the pursuit of target stocks in a fishery, including 'regulatory discards' as defined under the Magnuson-Stevens Act section 3(38). They may or may not be retained for sale or personal use." Non-target species included in a fishery should be identified at the stock level. *Id.* § 600.310(d)(2)-(4).

[10] *See* 50 C.F.R. § 600.310 (d)(7) ("If a stock is identified in more than one fishery, Councils should choose which FMP will be the primary FMP in which management objectives, SDC, the stock's overall ACL and other reference points for the stock are established.").

[11] *See* 50 C.F.R. § 600.310(a), (b)(ii).

Flaherty v. Bryson case or to ignore the law outlined in that opinion when making management decisions about River Herring would ignore critical information on how to determine the composition of this fishery for management and violate the law.

River herring and shad are involved in the Atlantic herring fishery and capable of being managed as part of it. *See* Amendment 5 DEIS at p. 134; see also p. 447 (Coincidence of River Herring and Shad); *see also Flaherty,* 2012 WL at * 12 ("Defendants' conclusory statement that river herring would simply have to wait until a future amendment does not suffice."). The incidental catch of river herring and shad by all ocean-intercept fisheries (including the herring fishery) averaged an estimated 459 metric tons of river herring per year and an estimated 63 metric tons of shad per year.[12] By contrast, landings of river herring and shad, provided by the ASMFC for fisheries in state waters during the same time period, averaged 601 and 581 metric tons respectively.[13] Further, it is estimated that the mid-water trawl fishery for both Atlantic herring and Atlantic mackerel accounts for 71% of the combined incidental catch of river herring and shads. NMFS Observer records show that at-sea fishing vessels may take as much as 20,000 pounds of blueback herring in a single net haul.[14] River herring and shad are caught, kept, landed and sold in this fishery, as well as discarded as bycatch.[15] Thus, it is indisputable that these species are involved in the Atlantic herring fishery and can be managed as part of it.

River herring and shad are in dire need of conservation and management. In addition to the science identified in the DEIS for Amendment 5 (and the DEIS for Amendment 14)[16], the new benchmark stock assessment for river herring, approved for management use by the ASMFC on May 1, 2012, confirms that river herring along the entire Atlantic seaboard are depleted, with many of the river runs barely persisting and near historic lows.[17] Of 24 river stocks that the stock assessment team was able to characterize regarding current condition, 92% were described as depleted.[18] There were "severe declines in [fishery] landings began coastwide in the early 1970s and domestic landings are now a fraction of what they were at their peak having remained at persistently low levels since the mid-1990s."[19] U.S. commercial landings are down 93% from the 1970's.[20] The peer review panel similarly observed that "[s]tocks of river herring are greatly depleted compared to the early 17th century baseline, as well as compared to that of the late 19th century."[21] And "...concurs with the SASC [stock assessment sub-committee] conclusions that river herring stocks are depleted, that ocean bycatch is an issue, and that recovery will require

---

[12] *See* Amendment 14 DEIS at p. 222.
[13] *Id.*
[14] *See* Haul data from North East Fisheries Observer Program, NMFS; Landings data from NOAA's Annual Commercial Landing Statistics, available at: www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html.
[15] *See* Amendment 5 DEIS at pp. 54, 134, 447; *see e.g.* analyses in Appendix IIA, VI, VII (Volume II).
[16] *See* Amendment 14 DEIS, § 2.1.9 Addition of RH as "Stocks in the Fishery" in the MSB FMP at pp. 82-89, § 6.2.5 River Herring Stock Status at p. 210, §6.5.6 Description of Candidate Species for Listing Under the ESA, at p. 240.
[17] *See* The ASMFC's River Herring Stock Assessment Report No. 12-02, Volume I – Coastwide (May 2012) ("Stock Assessment Report").
[18] Stock Assessment Report - Executive Summary.
[19] Stock Assessment Report - Executive Summary.
[20] Stock Assessment Report - Executive Summary.
[21] *Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review* (March 2012)("Peer Review Report"), Intro. p. 8.

management on multiple fronts. . .."[22] For the first time ocean bycatch of river herring was examined in a stock assessment, and it concluded that at-sea fisheries are a significant factor in the decline of the species' populations over the last 50 years.[23]

In addition to the new stock assessment, NMFS recently determined that a listing of river herring (blueback herring and alewife) as "threatened" under the Endangered Species Act may be warranted.[24] Finding that the petition presented "substantial scientific information that the petitioned action may be warranted" NMFS initiated a year-long status review. As described in the petition, existing state and federal regulatory mechanisms are insufficient for river herring.[25] The current federal/state/regional management framework has avoided the coordinated management necessary to conserve and manage these species. Specifically, the regulatory measures drafted by the Atlantic States Marine Fisheries Commission (ASMFC) in Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring, and implemented through state laws, have proven insufficient because this interstate compact agency has confined the reach of its plan to state waters. Moratoriums on directed fisheries for river herring in several states have been in place for years without sufficiently beneficial results.[26] Although the ASMFC is required to coordinate its management measures with NMFS to promote the conservation of stocks throughout their ranges, this authority has not been exercised.

Shads also need conservation and management. As noted above, figures used to develop Amendment 14 indicate that on average 120,000 pounds of shad were caught per year in ocean intercept fisheries including the Atlantic herring fishery from 2006-2010.[27] Of these approximately 600,000 fish, many of them were juveniles.[28] Currently, shads are managed under Amendment 3 to the IFMP for Shad and River herring and according to the most recent stock assessment their status is "depleted" as well - finding that "stocks were at all-time lows and did not appear to be recovering to acceptable levels."[29] The stock assessment also noted that coast-wide declining trends raised flags that ocean mortality was having a serious impact, and the peer review team listed bycatch monitoring as a high priority for future action.[30] Amendment 3 currently prohibits ocean intercept fishing for shad, however there is little enforcement. No assessments are available for hickory shad but as noted in the Amendment 14 DEIS, "many runs

---

[22] *Id.* at p. 8.
[23] *Id.*
[24] In response to a petition filed by the in response to a petition filed by the National Resources Defense Council (NRDC), NMFS made a 90 day finding that a listing may be warranted, 76 Fed. Reg. 67652 (Nov. 2, 2011). Listing determinations are made solely on the basis of the best scientific and commercial data available, after a full status review, and taking into account all efforts to protect and manage the species. 16 U.S.C. § 1533(b)(1)(A).
[25] *See* NRDC Petition at 78-79.
[26] Connecticut, Massachusetts, Rhode Island, and North Carolina have prohibited harvest for several years without recovery of species' populations. *See* Species Profile: River Herring States and Jurisdictions Work to Develop Sustainable Fisheries Plans for River Herring Management, p.2 available at: http://www.asmfc.org/shadRiverHerring.htm. Sustainable Fishery Plans have been approved for 5 states (Maine, New Hampshire, North Carolina, South Carolina and New York.
[27] *See* Amendment 14 DEIS, §4.1.B at p. 111.
[28] *Id.*
[29] ASMFC. August 2007. Stock Assessment Report No. 07-01 (Supplement) of the Atlantic States Marine Fisheries Commission: American Shad Stock Assessment for Peer Review, Volume 1.
[30] *See* ASMFC American Shad Stock Assessment Peer Review Panel, Stock Assessment Report No. 07-01 of the ASMFC, Terms of Reference & Advisory Report to the American Shad Stock Assessment Peer Review. July 2007.

are likely below historical levels for reasons similar to those discussed below for Atlantic shad."[31]

River herring and shad populations remain in a severely depleted state, and federal waters ocean catch has been firmly identified as an ongoing threat to these fish. While the ASMFC has implemented conservation measures in state waters up and down the coast, it has ultimately not adopted any protections for federal waters, placing the responsibility squarely on the New England Council, as well as NMFS and the Mid-Atlantic Council to conserve and manage these species.

5. Industry's Argument Regarding Stock in the Fishery Designation Is Incorrect

Recently, industry has argued a new (and misguided) legal theory regarding the addition of river herring and shad as stocks in the fishery. *See* June 4, 2012, Letter from Lund's Fisheries Incorporated to Executive Director MAFMC re Amendment 14, at p. 8. Industry now claims that "stock determination criteria" are a necessary pre- condition for establishing a species as a 'stock in the fishery' under the National Standard One guidelines, and that the ASMFC stock assessment is fraught with disclaimers preventing its use to assess status. *Id.* This interpretation of the final rule is incorrect for a number of reasons.

As outlined above, the relevant inquiry into *what* species should be added to an FMP is found in the Magnuson-Stevens Act. The Magnuson-Stevens Act requires Councils to first determine the species involved in their fisheries and then prepare an FMP for those that require conservation and management.[32] To prevent overfishing, that plan must specify "objective and measurable criteria."[33] National Standard One Guidelines reinforce this and require stocks involved in the fishery be identified, so they can be added to an FMP, and status determination criteria used to prevent overfishing. *See* 50 C.F.R. §§ 600.310 (d)(1), (d)(4), and (e)(2). In that order, stocks are identified as needing conservation and management, added to a plan, and criteria are established (if not already available) to ensure that the plan prevents overfishing.

The preamble to the final rule industry refers to simply states that "'Stocks in the fishery' need status determination criteria, other reference points, ACL mechanisms and AMs." *Final Rule*, 74 Fed. Reg. 3178 at 3179 (Jan. 16, 2009). "Need" does not equate to a prerequisite. No one disputes that all stocks ultimately "need" criteria to prevent overfishing; however, nothing in the Act, the final rule, or the regulations require status determination criteria *prior* to adding them as stocks in the fishery. On the contrary, the regulations contemplate the order discussed above and the use of proxies (if necessary), based on the best scientific information available, for reference points not yet identified - including proxies for MSY, F_{MSY} and B_{MSY}.[34] Finally, the ASMFC's river herring stock assessment has been peer-reviewed and approved for management use by the ASMFC. It cannot now be used as an excuse not to manage these species. This stock assessment report is the best available science and while it does not provide reference points for

[31] Amendment 14 DEIS, § 6.2.6 at p. 213.
[32] *See* 16 U.S.C. §§ 1852(h)(1), 1853(a)(2); *see also Flaherty v. Bryson*, 2012 WL 752323 at * 11, 12.
[33] *Id.* at § 1853(a)(10).
[34] *See* 50 C.F.R. § 600.310(e)(1)(iv) ("Where this uncertainty cannot be directly calculated, such as when proxies are used, then a proxy for the uncertainty itself should be established based on the best scientific information, ...").

a coastwide river herring complex, it provides ample evidence that river herring and shad are caught in large numbers in federal waters by midwater trawlers in ocean intercept fisheries, are in need of conservation and management, and thus should be added to a plan.

Section 3.2: Catch Monitoring: At-Sea

Robust monitoring of this industrial fishery should be viewed as a mandatory precondition for access to millions of pounds of these vital public resources (i.e., Atlantic herring, river herring, shad, and mackerel). Congress intended that there be both "limits" and "accountability" in fisheries, with the ultimate goal of "protect[ing], restor[ing], and promot[ing] the long-term health and stability of the fishery." 16 U.S.C. § 1853(a)(1)(A). In order to achieve accountability, the Magnuson-Stevens Act requires that FMPs include monitoring and reporting measures necessary to track retained catch and discarded bycatch, including a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery). *See* 16 U.S.C. §§ 1853(a)(5), (a)(11). Adequate monitoring and bycatch measures are also vital to ensuring that overfishing is prevented. *See e.g., Flaherty,* 2012 WL at *16 ("to meet their responsibility to ensure compliance with the National Standards, Defendants must demonstrate that they have evaluated whether the FMP or amendment minimized bycatch to the extent practicable.").

Only those alternatives which increase the accuracy and timeliness of vessel and dealer reporting (discussed below), coupled with management measures that greatly improve the accuracy and precision of third-party (i.e. observer) incidental catch estimates should be selected in Amendment 5. 100% monitoring of A and B vessels could also make the task of independently estimating the landed catch because observers could easily accomplish this during the return to port. This could be done by inspection of certified / calibrated holds, thereby reducing some of the administrative and economic burden contemplated under the proposed Reporting Requirements (section 3.1.5). The measures approved in Amendment 5 should be consistent with those approved by the Mid-Atlantic Council in Amendment 14 to avoid discrepancies that would make implementation difficult or allow fishing effort to avoid robust monitoring in one FMP by selectively declaring into another fishery.

1. <u>The Council Must Require 100% Observer Coverage of Category A and B vessels With Industry Funding that Part of Coverage NMFS Does Not Fund</u>

The Council must approve a robust at-sea monitoring for the largest vessels in the herring fleet, particularly the large midwater and midwater pair trawl vessels operating with Category A and Category B permits. Although recently improved, the observer coverage rate averages less than 40% on herring trips.[35] The Herring Alliance recommends 100% at-sea monitoring coverage for Category A and B vessels, with the industry providing supplementary funding as needed to pay for the coverage, and enhanced protocols necessary to ensure that observers have access to all catch for sampling. Specifically, the Herring Alliance recommends the following alternatives:

[35] *See* Amendment 5 DEIS, § 4.2.1.2 at 133.

- Section 3.2.1.2 Alternative 2: Require 100% Observer Coverage on Limited Access herring vessels. With the following sub-options.
    - Funding Option 2: Federal and Industry Funds
    - Service Provider Option 1: No Action

Alternative 3.2.1.2 should be modified to clarify that it only applies to Category A and B vessels. Vessels of this size and fishing power, fishing with a small-mesh gear prone to catastrophic bycatch events of depleted species like river herring, require very high levels of observer coverage. In fact, the only two comparable fleets in the U.S., the west coast MWT fishery for Pacific whiting (hake) and the Alaska (walleye) Pollock MWT fishery, both employ mandatory 100% at-sea observer coverage.[36] There are approximately 30 Category A and B vessels active in the Atlantic herring fishery that account for nearly 97-99% of the landings.[37] The status quo monitoring regime in this fishery cannot provide precise and accurate estimates of catch,[38] nor is it even capable of preventing repeated and destructive quota overages.[39]

The Herring Alliance supports Funding Option 2, under which an industry-funded observer program would be implemented to meet the goal of 100% observer coverage in cases when federal funds were unavailable. A number of herring harvesting and processing entities, along with the vast majority of other herring fishery stakeholders, have supported this option.[40] **The Herring Alliance is opposed to "grandfathering" all States in the Northeast Region as service providers for sea sampling and is opposed to the issuance of waivers which would essentially nullify any requirement for 100% observer coverage in the fishery.** No States are currently providing observer services and as such none have acquired NMFS approval as service providers.[41] Therefore the very concept of "grandfathering" is not applicable. Absent full certification by NMFS of any State wishing to provide observer services, NMFS and the public would have no assurances that the states would comply with NMFS data collection, processing, management, sharing, and transparency standards. As the Amendment 5 DEIS points out, their "operational details would be unknown."[42] This is not an acceptable scenario, and even the Northeast Observer Program (NEFOP) opposes this option.[43] Finally, One hundred percent coverage must mean just that: 100%. A blanket provision allowing the unlimited

---

[36] *See* 50 C.F.R. §§ 660.140, 660.150, 660.160 (Whiting) and 679.50 (Pollock).
[37] *See* Amendment 5 DEIS, Table 49 at p. 225 and Table 61 at p. 238.
[38] *See* Am 5 DEIS at p. 366 explaining that the Standardized Bycatch Reporting Methodology (SBRM) Amendment governing observer coverage in Northeast U.S. fisheries was recently vacated in response to a federal court ruling, at page 486 acknowledging the high degree of uncertainty in river herring removals estimates, and at page 415 illustrating that in 2010 over 450,000 pounds of catch in the fishery could not be identified to species (i.e. was classified as "Herring, Not Known" or "Fish, Not Known."
[39] *See* Final Rule Amendment 4, 76 Fed. Reg. 11373 (Mar. 2, 2011) (showing that between 2001 and 2009, management area closure thresholds were exceeded on 8 of 36 occasions; *see also* NMFS quota monitoring reports at http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm showing that this trend has continued in recent years, with cascading overages in management Area 1B of 138% (2010) and 156% (2012)).
[40] *See* Amendment 5 written comment compilations at http://www.nefmc.org/herring/cte%20mtg%20docs/120606/HR%20A5%20COMMENTS%20NEFMC%20.pdf and http://www.nefmc.org/herring/cte%20mtg%20docs/120606/HR%20A5%20COMMENTS%20NERO.pdf
[41] *See* Amendment 5 DEIS at p. 394.
[42] *Id.*
[43] *Id.*

issuance of waivers with no backstops or other accountability measures is likely to seriously undermine any 100% coverage requirement or other target coverage level.

2. The Council Must Implement the Closed Area 1 Rules Fishery-Wide With a Fleetwide Limit of Five "Slippage" Events Per Management Area

As a deterrent to wasteful dumping the Herring Alliance supports Section 3.2.3.4 Option 4D:

- Section 3.2.3.4 Option 4D: Measures to Address Net Slippage - Closed Area I Provisions with Trip Termination Only (5 Events per Management Area)

In addition to 100% observer coverage, the Council should close loopholes that undermine the accuracy, precision, reliability and completeness of observer data by allowing significant amounts of catch to be discarded at sea prior to being sampled by observers. This practice, known also as "dumping" or "slipping" catch is an ongoing problem in the Atlantic herring fishery. The highly successful pilot program in Closed Area 1 (CA1) has proven effective in controlling dumping without undue impact on herring fishery operations.

The Council should explicitly clarify that consistent with the current CA1 sampling regulations, under Option 4D operational discards: a) must be brought aboard for sampling; b) may only be dumped under one of the other three allowable exceptions (safety, mechanical failure, and spiny dogfish clogging the pump); and c) if dumped would be subject to the accountability requirements outlined in the measure (the dumping event would be tallied toward the fleetwide allowance of 5 dumping events per herring management area, and subsequent dumping would trigger a requirement to terminate the trip and return to port). In addition, the Council should clarify that the Closed Area 1 provisions identified in Alternative 3.2.3.4 Option 4D are based on the November 30, 2010 Final Rule codified at 50 C.F.R. § 648.80 as described in Alternative 3.2.3.3 and would apply to operational discards.[44]

At-sea dumping of un-sampled catch is a serious conservation concern, constituting significant amounts of bycatch.[45] It is also widespread, affecting over 30% of observed hauls in the fishery in 2010 alone,[46] unnecessary, wasteful, and undermines the validity of catch data.[47] Thus, it conflicts with National Standard 9 requirements to minimize bycatch and undermines the conservation objectives of Amendment 5.[48] There are proven and practical solutions to correct this situation. It is clearly demonstrated that the existing CA1 rules reduce bycatch and bycatch mortality, and they show, by the successful operational and safety record to date of the CA1

---

[44] In January 2011, the New England Council passed a motion clarifying that any reference to current federal regulations (i.e. the current CAI provisions) in the Amendment 5 document refers to those regulations as specifically codified in the CFR, which indicates that Option 4D must treat operational discards as they are treated under current CAI rules. *See* summary of NEFMC motions from January 2011 at http://www.nefmc.org/actions/motions/motions-jan11.pdf.

[45] *See e.g.* Amendment 5 DEIS at p. 414.

[46] *See* Amendment 5 DEIS at p. 414.

[47] *See* Amendment 5 DEIS at p. 415 (illustrating extent of catch not identified to species level due to dumping), and at p. 419 (illustrating that most at-sea dumping is not necessary).

[48] *See* Amendment 5 DEIS, § 2.0 Goals and Objectives.

rules, that such an approach is a practical approach to minimizing bycatch consistent with National Standard 9.

Trip terminations after a slippage event are a necessary accountability measure and a deterrent to discourage abuse of the dumping exceptions; however, the measure must be effectively translated from one that is custom-crafted to apply to CA1 into one that works for the entire fishery. A hybrid approach which grants a fleet-wide allowance of dumping events per herring management area, followed by a trip termination requirement, is a sensible and justified solution. Further, the proposed fleetwide allowance is neither arbitrary nor unreasonable. As the DEIS points out, observed dumping events in the fishery in past years are reasonably proportioned to the proposed allowance under Option 4D, especially in view of the probable elimination of unnecessary dumping that will result from the new rules driving behavioral changes.[49] Given the buffer against trip termination provided by the dumping allowance, the three exceptions provided under which dumping could occur, and the success to date of the CA1 pilot program (no trips were required to leave CAI in 2010, and to date there have been no reports of safety or operational problems in 2011, the first year in which operational discards were required to be brought aboard) option 4D provides a reasonable balance that will deter slippage without unduly penalizing the fleet or individual vessels.

3. Additional Measures to Improve At-Sea Sampling

The Herring Alliance supports certain measures in Section 3.2.2.2 Option 2 (sub-options 2A, 2B, 2C, and 2E) to facilitate and improve sampling by observers:

- Section 3.2.2.2 Option 2: Implement Additional Measures to Improve Sampling with sub-options as follows.
    - Sub-option 2A – Requirements for a Safe Sampling Station
    - Sub-option 2B – Requirements for Reasonable Assistance
    - Sub-Option 2C – Requirements to Provide Notice of Starting Pumping Operations)
    - Sub-option 2E – Communication on Pair Trawl Vessels – to require improved Communications between Pair Trawl Vessels

The Herring Alliance opposes Sub-Option 2D (Requirements for Trips with Multiple Vessels), which would seemingly require a sensible step (the deployment of an observer on both vessels of any pair trawl trip assigned observer coverage), but contains an unacceptable loophole (the inclusion of the phrase "wherever/whenever possible"). Since a pair trawling operation is considered one trip by NEFOP, and since NEFOP has stated that it already adheres to this policy, this is one of the simplest monitoring reforms that can and should be applied to the fishery. Pumping of catch to an unobserved vessel in a pair trawl team is one of the biggest loopholes exploited by the mid-water trawl fleet and largest contributors to the widespread problem of the "Fish, Not Known" category that undermines catch composition data in the fishery.[50]

[49] *See* Amendment 5 DEIS at p. 433.
[50] *See* Amendment 5 DEIS at p. 418.

The Herring Alliance also opposes Sub-Option 2F (Visual Access to Net/Codend), which requires vessel operators provide "visual access" to the net for observers, as an entirely unacceptable, loophole that will not allow for actual catch sampling. NMFS has acknowledged that so-called visual access does not allow reliable catch estimation, stating (in final rule implementing revised CA1 sampling requirements) that absent the catch being brought aboard, "[s]pecies identification of fish remaining in the net is not typically possible. Observers may be able to identify some large bodied animals in the net, but are unable to reliably differentiate many fish to their species. Even if fish at the surface of the net are identifiable, the contents may not be homogeneous and the observer cannot determine the full composition of the net."[51]

3.1 Proposed Adjustments to the FMP

The Council must also approve measures that will enhance the efficiency, timeliness, and accuracy of catch monitoring and reporting in the fishery in order to improve the precision and accuracy of incidental catch estimates, which are extrapolations based on total reported landings. While Section 3.1 mainly proposes refinements, there are various self-reporting mechanisms (as opposed to true catch monitoring), which should instead be performed by trained, independent third party personnel (such as fishery observers), along with other administrative changes to the FMP that should be implemented. In many fisheries the veracity of catch reporting benefits from the opposing interests of those that catch and those that buy the fish. Such is not always the case in this industrial herring fishery where, due to vertical integration, under-reporting can be in the interest of both the seller and the buyer because they are essentially the same entity. Further, owing to the size or control of some industry participants relative to others, there may be additional pressure to under-report transactions.

Importantly, the Council should adopt measures that: 1) require (for the first time) that there be accurate and verifiable weighing of all catch in the fishery; 2) do not encourage new effort in the fishery; and, 3) improve monitoring and reporting while carefully avoiding the creation of loopholes in the program. The Herring Alliance supports the following alternatives:

1. **The Council Must Require Accurate and Verifiable Weighing of all Catch in the Fishery**

Standardizing the methods by which dealers weigh all catch and requiring vessels to confirm the amount of fish landed will result in better overall estimates of catch and help ensure that catch limits are not exceeded. Accurate landings data will also aid in monitoring a River Herring mortality cap, and in achieving better catch and bycatch estimates of river herring and shad. Accurate monitoring of target species can be as important as determining the encounter rates of River Herring when determining catch estimates due to the use of discard to kept ratios or other bycatch/incidental catch extrapolations.[52]

- Section 3.1.5.2: Option 2 - Require Dealers to Accurately Weigh All Fish

[51] *See* Discard Provision for Herring Midwater Trawl Vessels Fishing in Groundfish Closed Area I, Final Rule, 75 Fed. Reg. 73979 (Nov. 30, 2010).
[52] *See* Amendment 14 DEIS at p. 279.

- Sub-Option 2A:Annual Documentation of catch composition estimation methodology
- Sub-Option 2B: Weekly[53] reporting of catch composition estimation for each individual landing
- Sub-Option 2C: Dealer participation in SAFIS with vessel error-checking through Fish-On-Line

The requirement to weigh all fish and the sub-options 2A-2C are steps in the right direction, however, dealer or vessel self-reporting of unverifiable, unstandardized "hail" weights or visually-based volumetric estimates are ultimately inadequate and unacceptable because they leave opportunity for (deliberate or unintentional) misreporting. Third-party observers, port samplers, or law enforcement personnel should verify that accurate, complete and honest catch weights are being reported. **The Council should consider modifying this entire option to include as much third-party verification of landed catch weights as possible.** In fact, the most powerful aspect of requiring a verifiable weight or verifiable volumetric proxy is that unlike the current captain's "hail" weight or captain/dealer visual volumetric estimate, it can be verified by a third-party observer. There are simple solutions the Council could include. For example, the Council could require that NMFS Observers, when present on a trip, remain with the vessel throughout the offloading operation to verify the landed weight. With 100% observer coverage on A and B vessels and calibrated holds, considerable efficiency could be gained through involving on-board observers in objective catch estimation before off-load. For all of the sub-options, dealers that do not sort by species should be required to document in applications their method for estimating the composition of a mixed catch. If this method cannot be applied to a particular transaction, dealers should be able to apply an appropriate methodology as long as they document that method with the transaction.

2. **No Increase in Open Access Possession Limits**

To discourage new effort in the fishery, the Herring Alliance supports Section 3.1.6 Option 1:

- Section 3.1.6 Option 1: No Action – No increase in open access herring possession limits.

No changes to the current open-access possession limits in the Herring FMP are necessary or justified. Further, implementation of any of the proposed changes would potentially undermine the catch monitoring reforms proposed in this amendment through the creation of significant new herring fishing effort that might not be appropriately included in the monitoring program. Amendment 5 is clear: "available fishery data do not indicate that the current 3 [metric ton] possession limit of herring for open access permit holders is problematic at this time" and that this possession limit "does not appear to be resulting in bycatch/regulatory discards for vessels fishing in any of the management areas."[54] The herring fishery may have overcapacity concerns already, including in the sensitive inshore portions of Areas 2 and 3. This is illustrated most recently by the 2012 Mackerel Advisory Panel Fishery Performance Report, which cites industry

[53] Please note that the Amendment 5 DEIS narrative description of Sub-Option 2B on page 29 does not specify that weekly submission of landing event reports is required; however, the description of this sub-option in the Executive Summary on page xvi does specify that this is a weekly reporting requirement.
[54] *See* Amendment 5 DEIS at p. 357.

statements that the directed mackerel fishery in 2012 effectively experienced a premature closure due to rapid harvest of the available herring quota in Herring Management Area 2.[55]

3. Additional Catch Monitoring Reforms

The Herring Alliance recommends the Council approve the following measures:

- Section 3.1.1: Option B Proposed Regulatory Definitions
- Section 3.1.2: Option B Administrative/General Provisions. Sub-options as follows:
  - Sub-option 2A (Expand possession restrictions to vessels working cooperatively)
  - Sub-option 2B (Eliminate the VMS power-down provision)
  - Sub-option 2C (Establish an At-Sea Herring Dealer permit)
- Section 3.1.3.2.2: Option 2 Require VMS on Carrier Vessels
- Section 3.1.3.3: Option 3 Prohibit Transfers At-Sea to Non-Permitted Vessels
- Modified Section 3.1.4.2: Option 2 - Expand Pre-Trip Notification System (for Observers)
- Modified Section 3.1.4.3: Option 3 - Extend Pre-Landing Notification Requirement

The Council should modify Options 2 and 3 in Section 3.1.4 to specify that the pre-trip and pre-landing notification requirements also apply to Category D vessels fishing with mid-water trawl gear in all Herring Management Areas (Option 2 already proposes applying these notifications in Areas 1A, 1B and 3). The fishing industry and public have made clear they have concerns about mid-water trawl bycatch by the entire herring fishery, across all management areas. Further, it appears there may be some large mid-water trawl vessels that are mainly active in the mackerel fishery, but that also possess Category D herring permits. Requiring pre-trip and pre-landing notifications from all mid-water trawl vessels in all areas would facilitate placement of observers and portside spot-checks by NMFS Office of Law Enforcement.

Otherwise, the identified alternatives appear to improve catch reporting and some may indirectly support catch monitoring by providing a better understanding of overall fleet activities. Unverified self-reporting should not be a substitute for robust third-party catch monitoring, especially for the Category A and B vessels that catch the vast majority of the fish.
The proposed new fishery definitions appear reasonable and necessary; however it should be a priority to the Council and NMFS to ensure that no loopholes are created which allow catch to inadvertently remain unaccounted for under new monitoring requirements implemented through Amendment 5. For example, it appears that some at-sea transfers are actually also offloads, and the Council should clarify this issue. The Herring Alliance supports Option 3 in Section 3.1.3.3 because it will likely allow managers to better understand the practice of at-sea transfer by requiring all participating boats to have a herring permit, and thus to report their activities more robustly. **However, we oppose Option 2 under this alternative since it appears to restrict the practice of at-sea-transfer to only the largest vessels in the fishery, at the expense of traditional small boat herring fishermen.**

---

[55] *See* 2012 Industry Performance Report, *available at:* http://www.mafmc.org/meeting_materials/SSC/2012-05/1-Staff_2013_MSB_ABC_Memo.pdf, at pp. 5-6.

Section 3.4 Midwater Trawl Access to Groundfish Closed Areas

Groundfish bycatch problems in this fishery have increased, as shown by the midwater trawl industry's recent demands for a five-fold increase in their haddock bycatch allowance, granted by the Council in April 2011.[56] Recently available data also demonstrate that much of this problem results from fishing by mid-water trawl vessels in the Ground Fish Closed Areas (GFCA).[57]

1. Mid-Water Trawlers Fish Differently and Catch More Groundfish Than Previously Thought

Troubling evidence of "mid-water" trawlers fishing in the bottom of the water column has emerged, including seafloor contact by mid-water gear and VMS data showing the gear is fished during the day when Atlantic herring retreat to the bottom, validating concerns that, contrary to industry claims, the gear is deliberately fished at or near the bottom where rebuilding groundfish populations are found.[58] This represents a fundamental change in the understanding of how mid-water trawl gear is fished and the impacts from the gear that has occurred since it was approved for use in the year round GFCA's. In fact, even since Amendment 5 (originally known as Amendment 4) was initiated new information about this gear has emerged. Midwater trawl gear was approved for use in these sensitive groundfish spawning and nursery areas in 1998 under Framework Adjustment 18 based on industry claims, and an assumption by NMFS, that the gear was incapable of catching significant amounts of groundfish because it was fished in the middle of the water column away from groundfish populations.[59] Access was based on limited, at best, data (observer data from 13 tows, to be precise, with little to none in the actual groundfish closed areas).[60] The assumption that MWTs do not catch groundfish is now proven false.

Moreover, since mid-water trawler gained access to GFCA's in 1998, standards for approving access to closed areas have changed. Fishermen wishing to conduct operations in these areas today must conduct robust experimental fisheries with 100% catch sampling by independent observers, and may do so only after applying for and receiving Exempted Fishing Permits (EFP).[61] EFPs outline rigorous requirements for the scientific sampling of the catch, and typically include very stringent EFP-specific caps on target catch and on bycatch species.[62] Successful experimental fisheries must analyze and submit data and report on results to NMFS and the Council, including a rigorous review process before results can be used for management

---

[56] *See* Final Framework 46 to the Northeast Multispecies FMP, 76 Fed. Reg. 56985 (Sep. 15, 2011).
[57] *See e.g.,* Amendment 5 DEIS at p. 490.
[58] *See e.g.* Transcript of NEFMC Herring Oversight Committee meeting on September 1, 2010, pp. 185-190, available at: http://www.fishtalk.org/rc/nefmc/species/herring/transcripts/20100901_herring_am5_nefmc_os.pdf; *see also* Amendment 5 DEIS Table 10 at p. 134 (Catch and Discards on Observed trips Paired and Single Midwater Trawl, Permit Category A and B Trips, showing catch of debris as defined on p. 1.
[59] *See* Framework Adjustment 18 to the Northeast Multispecies FMP, 63 Fed. Reg. 7727 (Feb. 17, 1998).
[60] *Id. at* 7729-30 (NMFS would "determine the percent bycatch of [groundfish] based on sea sampling and other credible information for the fishery" and that such data "will be available" in order to reopen the closed areas in a "cautious manner" and ensure that the bycatch of groundfish is "minimal.")
[61] . *See* NEFMC Research Steering Committee Research Review Policy at http://www.nefmc.org/research/RSC%20ResearchReviewPolicy%20(2).pdf.
[62] *Id.*

purposes.[63] Finally, fishermen must successfully secure management measures through a change to an FMP in order to create new fishing opportunities in the closed area based on the experimental results.

2. **The Council Must Eliminate Access to Groundfish Closed Areas and Only Permit Future Access Through Carefully Tailored Exempted Fishing Permits**

In order to protect sensitive groundfish spawning grounds and reduce fishing mortality on groundfish through reduced effort in areas of known groundfish aggregations, the Herring Alliance supports Section 3.4.4 Groundfish Alternative 5.

- Section 3.4.4 Groundfish Alternative 5: Closed Areas

This action is critical given the recently emerging data that shows cod are in significantly worse condition than previously known and declining haddock population estimates. The risk that industrial herring trawlers will catch cod, include juvenile or spawning cod, and thereby stunt any progress on rebuilding cod is too great to allow continued access to GFCAs. It is also simply not fair to provide access to GFCAs by industrial trawlers that we now know fish on the bottom with small mesh nets, and catch groundfish in significant amounts, when New England's groundfishermen do not have access to these same areas as part of the effort to rebuild depleted groundfish populations.

The Council should rescind access to GFCA's immediately for all midwater trawl and paired midwater trawl vessels. Regardless of whether a new, more robust at-sea monitoring program is implemented for the entire Category A and B herring fleet through other actions in this amendment, the year-round groundfish closed areas can and should be subject to a higher standard. There is ample precedent for applying such a higher standard to fishing operations in the GFCA's. For example, groundfish gear is prohibited and there is an exempted fishing permit process, described above, which sets a higher bar for groundfishermen seeking access to GFCA's. Further, the Closed Area 1 regulations for mid-water trawlers require 100% observer coverage with specific rules to limit dumping of un-sampled.

Closing these areas to mid-water trawl vessels would encourage herring fishermen to design, apply for, and implement responsible and well-regulated experimental fisheries to determine if, where, when and how any future mid-water trawling in these areas should occur. This would ensure a public process prior to the issuance of any potential EFP's, through which the public and affected fishery stakeholders (i.e., groundfishermen) would have the opportunity to provide critical input on EFP conditions and experimental design. There are a number of appropriate monitoring measures, beyond the scope of this amendment or fishery-wide adoption at this time, which are appropriate for vessels applying for access to GFCA's. Examples include deployment of more than one observer on each vessel to ensure more effective and complete catch sampling, use of electronic monitoring measures such as bottom contact or footrope height sensors, use of video cameras at key locations where fish might be discarded but where observers do not have clear lines of sight, and at-sea catch weighing. In addition, any EFP allowing access to these

[63] *Id.*

areas for midwater trawl vessels should impose stringent EFP-specific caps on catch and bycatch, or other effort-based controls (such as limits on fishing near or on the seafloor) to control and limit negative impacts on groundfish from the experimental fishery.

* * *

Herring Alliance Member List

Alewives Anonymous
Rochester, Massachusetts
www.plumblibrary.com/alewives.html

Blue Ocean Institute
Cold Spring Harbor, New York
www.blueocean.org

Buckeye Brook Coalition
Warwick, Rhode Island
www.buckeyebrook.org

Chesapeake Bay Foundation
Annapolis, Maryland
www.cbf.org

Choptank Riverkeeper
Easton, MD
www.midshoreriverkeeper.org

Conservation Law Foundation
Boston, Massachusetts
www.clf.org

Delaware River Shad Fishermen's Association
Hellertown, Pennsylvania
www.drsfa.org

Earthjustice
Washington, DC
www.earthjustice.org

Eightmile River Wild & Scenic Coordinating Committee
Haddam, Connecticut
www.eightmileriver.org

Environmental Entrepreneurs (E2)
Boston, Massachusetts
www.e2.org

Environment America
Washington, DC
www.environmentamerica.org

Environment Connecticut
West Hartford, Connecticut
www.environmentconnecticut.org

Environment Maine
Portland, Maine
www.environmentmaine.org

Environment Massachusetts
Boston, Massachusetts
www.environmentmassachusetts.org

Environment New Hampshire
Concord, New Hampshire
www.environmentnewhampshire.org

Environment New Jersey
Trenton, New Jersey
www.environmentnewjersey.org

Environment New York
New York, New York
www.environmentnewyork.org

Environment North Carolina
Raleigh, North Carolina
www.environmentnorthcarolina.org

Environment Rhode Island
Providence, Rhode Island
www.environmentrhodeisland.org

Environment Virginia
Washington, DC
www.environmentvirginia.org

Farmington River Watershed Association
Simsbury, Connecticut
www.frwa.org

Float Fishermen of Virginia
Roanoke, Virginia
www.floatfishermen.org

Friends of the Rivers of Virginia
Roanoke, Virginia
www.forva.giving.officelive.com

Great Egg Harbor National Scenic and Recreational River Council
Newtonville, New Jersey
www.gehwa.org/river.html

Herring Alliance Member List

Greater Boston Trout Unlimited
Boston, Massachusetts
www.gbtu.org

Greenpeace
Washington, DC
www.greenpeace.org

Ipswich River Watershed Association
Ipswich, Massachusetts
www.ipswichriver.org

Island Institute
Rockland, Maine
www.islandinstitute.org

Jones River Watershed Association
Kingston, Massachusetts
www.jonesriver.org

Juniata Valley Audubon
Hollidaysburg, Pennsylvania
www.jvas.org

Lowell Parks & Conservation Trust
Lowell, Massachusetts
www.lowelllandtrust.org

Mystic River Watershed Association
Arlington, Massachusetts
www.mysticriver.org

National Coalition for Marine Conservation
Leesburg, Virginia
www.savethefish.org

Natural Resources Defense Council
Washington, DC
www.nrdc.org

Neponset River Watershed Association
Canton, Massachusetts
www.neponset.org

Neuse Riverkeeper Foundation
New Bern, North Carolina
www.neuseriver.org

New England Coastal Wildlife Alliance
Middleboro, Massachusetts
www.necwa.org

North and South River Watershed Association
Norwell, Massachusetts
www.nsrwa.org

NY/NJ Baykeeper
Keyport, New Jersey
www.nynjbaykeeper.org

Oceana
Washington, DC
www.oceana.org

Ocean River Institute
Cambridge, Massachusetts
www.oceanriver.org

Parker River Clean Water Association
Byfield, Massachusetts
www.businessevision.info/parker_river

Peconic Baykeeper
Quogue, New York
www.peconicbaykeeper.org

PennEnvironment
Philadelphia, Pennsylvania
www.pennenvironment.org

Pennsylvania Organization for Watersheds and Rivers
Harrisburg, Pennsylvania
www.pawatersheds.org

Pew Environment Group
Washington, DC
www.pewenvironment.org

Riverkeeper
Ossining, New York
www.riverkeeper.org

Rivers Alliance of Connecticut
Litchfield, Connecticut
www.riversalliance.org

Herring Alliance Member List

Shark Angels
New York, New York
www.sharkangels.org

Shenandoah Riverkeeper
Washington, DC
www.shenandoahriverkeeper.org

South River Federation
Edgewater, MD
www.southriverfederation.net

West and Rhode Riverkeeper
Shady Side, MD
www.westrhoderiverkeeper.org

THE GENERAL COURT OF MASSACHUSETTS
STATE HOUSE, BOSTON 02133-1053

June 1, 2012

RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

C.M. "Rip" Cunningham Jr., Chairman
New England Marine Fisheries Council
50 Water Street, Mill 2
Newburyport, MA 01950

RE: Herring Amendment V

Dear Chairman Cunningham,

We are writing to urge the NEFMC to adopt measures proposed in Amendment V aimed at increasing accountability and developing a comprehensive catch monitoring program. Our support of these measures is grounded in the belief that the current system is inadequate and that this critical fishery must have an effective monitoring system in place in order to ensure the longevity of the herring resource. There is a substantial need for increased catch monitoring and accountability measures.

Herring is commercially important as well as being an essential part of the ecosystem and food web. Herring is a "forage fish" that serves as a food source for other commercially important species. Thus, commercial fishermen, seafood processers, lobstermen, and recreational fishermen that target species such as Atlantic Cod, Striped Bass, Bluefin Tuna, and American Lobsters all rely on a vibrant and robust herring fishery. The economic impact of Atlantic Herring is broad and deep.

Reliable data and monitoring is essential both economically and ecologically. Therefore we respectfully request the Council consider the following measures:

- **Section 3.2.1 Alternative 2**- This option requires 100% observer coverage on limited access herring vessels.

- **Section 3.2.3.4 Option 4C**- This option disallows the practice of "dumping." Every fish must be brought on board for the observers to record. If a vessel dumps fish for safety or mechanical reasons, then that incident must be reported. This option further requires the closure of the Management Area if a threshold of 10 dumping incidents is reached. This measure is critically important to ensure an accurate catch count and to end a long standing practice.

- **Section 3.1.5 Option 2**- This option requires the accurate weighing and reporting of catch across the fishery.

- **Section 3.4.4 Alternative 5**- This option prohibits midwater trawl vessels from fishing in groundfish closed areas. The purpose of these closures is to protect important groundfish stocks. Like groundfishermen, mid-water trawl vessels should also be prohibited from fishing in closed areas. The likelihood of catching groundfish as bycatch is too great to allow fishing in these areas. There is also an important element of fairness contained in this alternative. If groundfish permit holders are prohibited from fishing in an area, the midwater trawl boats should be held to the same prohibition.

cc: LS, CMSC (6/4)

- **Section 3.3.5**- This section proposes the creation of a River Herring Catch Cap for the Atlantic Herring fishery in a future framework adjustment. This cap will help protect River Herring and is an important component of increasing River Herring biomass.

We respectfully ask that you adopt the proposals outlined above. These measures will help ensure the viability and stability of the herring stock and all other species that rely on a robust herring fishery. Adopting these measures will also ensure the stability of the New England commercial fishing industry. Now is the time to act.

Thank you for giving us the opportunity to comment.

Respectfully Submitted,

THERESE MURRAY
Senate President
Plymouth & Barnstable

SARAH K. PEAKE
State Representative
4th Barnstable

DANIEL A. WOLF
State Senator
Cape & Islands

DEMETRIUS J. ATSALIS
State Representative
2nd Barnstable

RANDY HUNT
State Representative
5th Barnstable

CLEON H. TURNER
State Representative
1st Barnstable

TIMOTHY R. MADDEN
State Representative
Barnstable, Dukes & Nantucket

BRUCE J. AYERS
State Representative
1st Norfolk

GEORGE N. PETERSON
State Representative
9th Worcester

KIMBERLY N. FERGUSON
State Representative
1st Worcester





MATTHEW A. BEATON
State Representative
11th Worcester



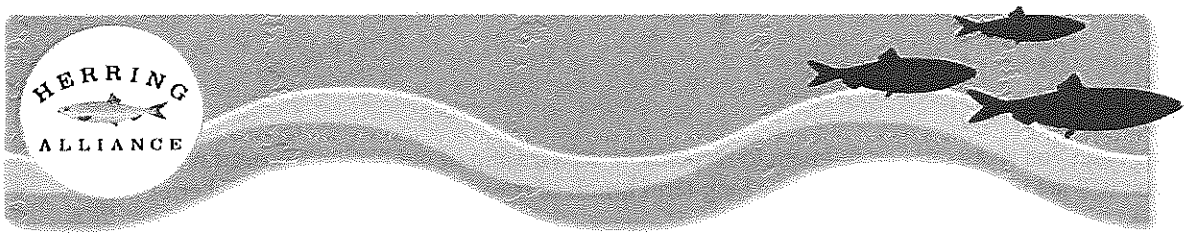
BRADLEY H. JONES
House Minority Leader
20th Middlesex



PETER V. KOCOT
State Representative
1st Hampshire



THOMAS M. STANLEY
State Representative
9th Middlesex



RECEIVED
JUN 04 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

June 4, 2012

Mr. Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, Massachusetts 01950

RE: EIS No. 20120104, Draft EIS, Amendment 5 to the Atlantic Herring Fishery Management Plan

Dear Mr. Howard:

The Herring Alliance is a coalition of 52 regional and national organizations dedicated to the restoration and conservation of forage fish species, including Atlantic herring, river herring and shad, which are vital to the health, productivity and resilience of our ocean and coastal ecosystems. Herring Alliance member organizations are actively engaged in ocean, river and watershed protection initiatives in nearly every state along the Atlantic coast. We have long been concerned about the impact of industrial fishing and have commented extensively throughout the development of the proposed reforms to the herring fishery. We urge you, the New England Fishery Management Council, to fulfill your commitment to meaningful improvements in the management of this fishery when you take final action on Amendment 5 during the June meeting.

The Draft Environmental Impact Statement (DEIS) of Amendment 5 gives due consideration to Atlantic herring and river herring as important forage fish. Many of the proposed measures have potential to improve the conservation and management of these species and the ecosystems they support. In the case of river herring, strong Council action will provide the first meaningful conservation and management measures of any kind for Federal waters. We urge the Council to approve the reforms that will be most effective at monitoring and accounting for all catch (bycatch and landings) and also limiting incidental capture of alewives and blueback herring. The following alternatives are the highest priorities of the Herring Alliance and most critical to the long-term stewardship of the ecosystem and the fishery:

- An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
- 100 percent at-sea monitoring on the largest vessels in the fishery (permit category A & B) in order to provide reliable estimates of all catch, including catch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
- Exclusion of category A & B vessels from areas where interactions with river herring have been demonstrated to be high; we support immediate closure of River Herring Protection Areas (Section 3.3.3.2.1 Option 1) and approval of Section 3.3.4 to allow the larger "River Herring Monitoring/Avoidance Areas" to be closed through a future Framework Adjustment.
- An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
- A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

59 Temple Place, Suite 1114, Boston, MA 02111
www.herringalliance.org | www.pewenvironment.org

We trust that you share our commitment to responsible stewardship of our Nation's coastal resources and that you will act in the best interest of the long-term health of ocean ecosystems and the fisheries they support.

Sincerely,

Peter Baker
Director, Herring Alliance
Director, Northeast Fisheries Program, Pew Environment Group
Boston, Massachusetts

Art Benner
President
Alewives Anonymous
Rochester, Massachusetts

Alan Duckworth, Ph.D.
Research Scientist
Blue Ocean Institute
Cold Spring Harbor, New York

Paul Earnshaw
President
Buckeye Brook Coalition
Warwick, Rhode Island

Bill Goldsborough
Director of Fisheries Programs
Chesapeake Bay Foundation
Annapolis, Maryland

Drew Koslow
Riverkeeper
Choptank Riverkeeper
Easton, Maryland

Sean Mahoney
Vice President and Director of Maine Advocacy Center
Conservation Law Foundation
Portland, Maine

Roger Fleming
Project Attorney
Earthjustice
Washington, DC

Anthony Irving
Chair
Eightmile River Wild & Scenic Study Committee
Haddam, Connecticut

John Rumpler
Senior Environmental Attorney
Environment America
Washington, DC

Emily Figdor
Environment Maine
Portland, Maine

Ben Wright
Environment Massachusetts
Boston, Massachusetts

Jessica O'Hare
Environment New Hampshire
Concord, New Hampshire

Channing Jones
Environment Rhode Island
Providence, Rhode Island

Berl Hartman
Director
Environmental Entrepreneurs (E2) New England
Boston, Massachusetts

Eileen Fielding
Executive Director
Farmington River Watershed Association
Simsbury, Connecticut

William Tanger
President
Float Fishermen of Virginia
Friends of the Rivers of Virginia
Roanoke, Virginia

Fred Akers
River Administrator
Great Egg Harbor National Scenic and Recreational River Council
Newtonville, New Jersey

Phil Kline
Senior Oceans Campaigner
Greenpeace
Washington, DC

Kerry Mackin
Executive Director
Ipswich River Watershed Association
Ipswich, Massachusetts

Pine DuBois
Executive Director
Jones River Watershed Association
Kingston, Massachusetts

Stan Kotala
Conservation Chair
Juniata Valley Audubon
Hollidaysburg, Pennsylvania

EkOngKar Singh Khalsa
Executive Director
Mystic River Watershed Association
Arlington, Massachusetts

Pamela Lyons Gromen
Executive Director
National Coalition for Marine Conservation
Leesburg, Virginia

Brad Sewell
Senior Attorney
Natural Resources Defense Council
Washington, DC

Steve Pearlman
Advocacy Director
Neponset River Watershed Association
Canton, Massachusetts

Carol Carson
President
New England Coastal Wildlife Alliance
Middleboro, Massachusetts

Samantha Woods
Executive Director
North and South River Watershed Association
Norwell, Massachusetts

Deborah A. Mans
Baykeeper & Executive Director
NY/NJ Baykeeper
Keyport, New Jersey

Rob Moir
Executive Director
Ocean River Institute
Cambridge, Massachusetts

Gib Brogan
Northeast Representative
Oceana
Washington, DC

George Comiskey
President
Parker River Clean Water Association
Byfield, Massachusetts

Kevin McAllister
President
Peconic Baykeeper
Quogue, New York

Adam Garber
PennEnvironment
Philadelphia, Pennsylvania

Joshua S. Verleun
Staff Attorney & Chief Investigator
Riverkeeper
Ossining, New York

Margaret Miner
Executive Director
Rivers Alliance of Connecticut
Litchfield, Connecticut

Jaime Lynn Pollack
Shark Angels
New York, New York

Erik Michelson
Executive Director
South River Federation
Edgewater, Maryland

Chris Trumbauer
Riverkeeper and Executive Director
West/Rhode Riverkeeper
Shady Side, Maryland

Other Herring Alliance members:

Delaware River Shad Fishermen's Association, Hellertown, Pennsylvania
Environment Connecticut, West Hartford, Connecticut
Environment New Jersey, Trenton, New Jersey
Environment New York, New York, New York
Environment North Carolina, Raleigh, North Carolina
Environment Virginia, Washington, DC
Greater Boston Trout Unlimited, Boston, Massachusetts
Island Institute, Rockland, Maine
Lowell Parks & Conservation Trust, Lowell, Massachusetts
Neuse Riverkeeper Foundation, New Bern, North Carolina
Pennsylvania Organization for Watersheds and Rivers, Harrisburg, Pennsylvania
Shenandoah Riverkeeper, Washington, DC

Alicia LaPorte
1621 1st St NW
1
Washington, DC 20001-1101

Mar 8, 2012

Paul Howard
New England Fishery Management Council

Subject: Re: Atlantic Herring Fishery Management Plan

Dear Paul Howard,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring. Populations of these fish have declined by 99 percent and are so depleted they are being considered for protection under the Endangered Species Act.

Most Atlantic states now prohibit the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch by industrial herring ships.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. Many tireless citizens carefully shepherd migrating river herring past in-river obstacles by hand. The council must support, not undermine, these efforts.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch reduction program that incorporates the following management actions:

* Immediate implementation of a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage or dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Example of 778 Batch
Emails Rec'd to date

Alicia LaPorte
1621 1st St NW
1
Washington, DC 20001-1101

Mar 8, 2012

Paul Howard
New England Fishery Management Council

Subject: Re: Atlantic Herring Fishery Management Plan

Dear Paul Howard,

I am writing to express my concern about poorly managed industrial fishing and the damage it inflicts on the ocean ecosystem, especially to river herring. Populations of these fish have declined by 99 percent and are so depleted they are being considered for protection under the Endangered Species Act.

Most Atlantic states now prohibit the harvest of river herring in coastal waters, even to the point of prohibiting children from netting one for bait. Yet astoundingly, no protections have been extended to these fish in the open ocean, where they are taken by the millions as profitable bycatch by industrial herring ships.

This is unacceptable and represents a significant setback in the ongoing efforts to restore alewife and blueback herring. Every year, states and communities throughout New England invest significant time and resources to restore their river herring runs. Many tireless citizens carefully shepherd migrating river herring past in-river obstacles by hand. The council must support, not undermine, these efforts.

As the council finalizes its revision to the Atlantic Herring Fishery Management Plan, I strongly urge you to approve a comprehensive monitoring and bycatch reduction program that incorporates the following management actions:

* Immediate implementation of a catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage or dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering my comments and for your continued commitment to improving management of the Atlantic herring fishery.

Sincerely,
Alicia LaPorte

THE PEW ENVIRONMENT GROUP

June 4, 2012

Paul J. Howard
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Dear Mr. Howard,

The Pew Environment Group has collected 42,289 comments from individuals asking the New England Fishery Management Council to take specific steps to manage the Atlantic herring fishery through Amendment 5 to the Atlantic Herring Fishery Management Plan.

Below you will find a summary the responses from Atlantic states (22,819), and on subsequent pages there is a table of all comments received by state.

A sample letter is included, as well as a spreadsheet with all the names and city, state and country of the individual signers. Please note that many of these letters have been personalized or include additional comments. All files will be copied to a CD and mailed to your office.

Connecticut: 1,453
District of Colombia: 79
Delaware: 183
Florida: 2,006
Georgia: 414
Massachusetts: 3,105
Maryland: 1,106
Maine: 681
North Carolina: 1,580
New Hampshire: 571
New Jersey: 1,882
New York: 5,269
Pennsylvania: 2,523
Rhode Island: 404
South Carolina: 204
Virginia: 1,359

Thank you,

Greg Wells
Associate, Northeast Fisheries Program

Pew Environment Group | The Pew Charitable Trusts
59 Temple Place, Suite 1114 | Boston, MA 02111| p: 617.728.0300
www.PewEnvironment.org

State	Comments collected
Alaska:	78
Alabama:	157
Arkansas:	107
Arizona:	734
California:	5240
Colorado:	717
Connecticut:	1453
District of Colombia:	79
Delaware:	183
Florida:	2006
Georgia:	414
Hawaii:	183
Iowa:	182
Idaho:	109
Illinois:	1104
Indiana:	407
Kansas:	161
Kentucky:	208
Louisiana:	140
Massachusetts:	3105
Maryland:	1106
Maine:	681
Michigan:	734
Minnesota:	485
Missouri:	367
Mississippi:	83
Montana:	112
North Carolina:	1580
North Dakota:	26
Nebraska:	86
New Hampshire:	571
New Jersey:	1882
New Mexico:	373
Nevada:	270
New York:	5269
Ohio:	760
Oklahoma:	143
Oregon:	730

Pennsylvania:	2523
Rhode Island:	404
South Carolina:	204
South Dakota:	36
Tennessee:	347
Texas:	1299
Utah:	171
Virginia:	1359
Vermont:	123
Washington:	1114
Wisconsin:	568
West Virginia:	93
Wyoming:	35
TOTAL	**42289**
TOTAL US ONLY	**40370**
Atlantic States	**22819**

Example of 42,289 Batch Emails Rec'd to date

Mr. P Henry
300 Park Terrace Dr
Stoneham, MA 02180-4438

Mar 16, 2012

Paul Howard
New England Fishery Management Council

Subject: Re: Atlantic Herring Fishery Management Plan

Dear Paul Howard,

Over four years ago, the public called for and the New England Fishery Management Council (NEFMC) committed to improving the management of industrial fisbing in New England. Now, after several years of deliberation and tens of thousands of public comments, it's time to deliver on that promise of reform.

Inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping are significant and pressing concerns. Your revision to the Atlantic Herring Fishery Management Plan must address these issues and bring greater accountability and oversight to the industrial trawl fleet.

Since the initiation of Amendment 5, these problems have continued to get worse. The National Marine Fisheries Service (NMFS) has repeatedly proven unable to enforce Atlantic herring quotas, the first step in fishery management, due to inadequate catch monitoring. In addition, the practice of slipping catch at sea continues to undermine efforts to identify and record everything that is caught by herring vessels. Alarming interactions with groundfish also continue, as midwater trawl fishermen recently demanded and received a five-fold increase in their haddock bycatch allowance.

Moreover, river herring populations remain depleted, forcing Atlantic seaboard states to close traditional fisheries and deprive recreational anglers and the public of this important resource. NMFS is now considering listing river herring under the Endangered Species Act.

I urge you, as trustees of our nation's marine resources, to fulfill your duty to conserve and manage these resources sustainably by approving this long-awaited revision without further delay. In particular, I strongly support:

* A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of the catch cap).
* 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
* An accountability system to discourage the wasteful slippage of catch, including a fleet-wide allowance of five slippage events for

each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
* No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
* A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

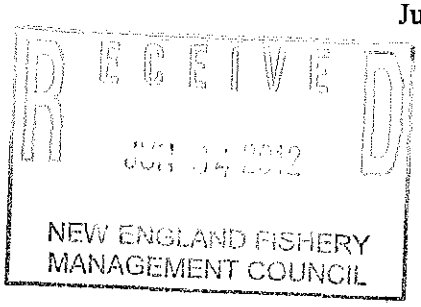
Thank you for the opportunity to comment and for your sustained commitment and support of these priority reforms.

Sincerely,
Mr. P Henry

THE PEW ENVIRONMENT GROUP

Captain Paul J Howard, Executive Director
New England Fishery Management Council
50 Water Street Mill 2
Newburyport, MA 01950

June 4, 2012



RE: Comments on Draft Amendment 5

Dear Captain Howard,

On behalf of the Pew Environment Group I am writing in response to the New England Fishery Management Council's (NEFMC or Council) request for public comments on Amendment 5 (Am 5) Draft Environment Impact Statement (DEIS) to the Atlantic Herring Fishery Management Plan (FMP). Providing adequate conservation and management of the forage fish resources of the Northeast Shelf ecosystem, including target (Atlantic herring) and non-target (river herring and shad) species in the Atlantic herring fishery, requires immediate and fundamental changes in this FMP encompassing catch monitoring, bycatch/incidental catch reduction, and bycatch/incidental catch limits. As the core of its final action on this FMP amendment, the Council must select the following alternatives from the Am 5 DEIS:

- A requirement to accurately weigh and report all catch **(Section 3.1.5 Option 2).**
- 100 percent at-sea monitoring on the largest vessels in the fishery (permit category A & B) in order to provide reliable estimates of all catch, including catch of depleted river herring and other marine life **(Section 3.2.1.2 Alternative 2).**
- An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleet-wide limit of five slippage events for each herring management area, after which any slippage event would require a return to port **(Section 3.2.3.4 Option 4D).**
- An immediate catch limit, or cap, on the total amount of river herring and shad caught in the directed Atlantic herring fishery **(Section 3.3.5, modified to require immediate implementation of a catch cap).**
- Add river herring and shad as "non-target stocks in the fishery" with immediate initiation of an action to establish the status determination criteria and other required management measures **(Section 3.3.5, modified to include river herring and shad as non-target stocks in the FMP).**
- Closure to directed herring fishing of areas where interactions with river herring have been demonstrated to be high; we support immediate closure of the River Herring Protection Areas to directed herring fishing **(Section 3.3.3.2.1 Option 1).** Since the "River Herring Protection Areas" that would be closed under this option are relatively small, the Council should approve **Section 3.3.4** to allow for a future expansion, through a Framework Adjustment, of the closures to the larger "River Herring Monitoring/Avoidance Areas" if appropriate.
- A ban on herring midwater trawling in areas established to promote rebuilding of groundfish populations **(Section 3.4.4 Alternative 5).**

Pew Environment Group | The Pew Charitable Trusts
59 Temple Place, Suite 1114 | Boston, MA 02111| p: 617.728.0300
www.PewEnvironment.org

Introduction:
The NEFMC decided to initiate the management action now known as Amendment 5 in the fall of 2007, in response to what were, at the time, the most comments it had ever received on an issue: over 10,000 calling for bycatch monitoring and reduction reforms and sent by concerned members of the public, conservationists, and commercial and recreational fishermen.[1] These voices overwhelmingly called for robust observer coverage including controls on at-sea dumping of un-sampled catch, eliminating midwater trawl (MWT) vessel access to Groundfish Closed Areas (GFCA), and introducing measures to protect severely depleted populations of anadromous river herring. The NEFMC deserves credit for responding to these voices, but because the development of these actions has been repeatedly delayed, and thus the call for action has perhaps become a remote echo to some, it is useful to look back at the past five years to illustrate that the voices have only grown louder, and the problems in the fishery are more evident and troubling than ever before.

First, a brief review of new information on the extent of problems in the fishery, much of which has come to light through the process of developing Am 5, shows that the concerns of the Pew Environment Group and the public are firmly validated:

- The status quo monitoring regime in the fishery cannot provide precise and accurate estimates of catch[2], nor is it even capable of preventing repeated and destructive quota overages.[3]
- At-sea dumping of un-sampled catch has been demonstrated to be serious and widespread, affecting over 30% of observed hauls in the fishery in 2010 alone.[4] It has also been shown to undermine the validity of catch data and in most cases to be unnecessary and wasteful bycatch, in turn undermining conservation objectives of the FMP.[5]
- Groundfish bycatch problems have increased, as evidenced by midwater trawl industry demands for a five-fold increase in their haddock bycatch allowance, granted by the

[1] See public comment compilation for November 2007 NEFMC meeting at http://www.nefmc.org/press/council_discussion_docs/Nov2007/Priorities.pdf and Pew Environment Group press release dated November 7, 2007 available at http://www.pewenvironment.org/news-room/press-releases/statement-of-peter-baker-of-the-pew-environment-group-and-director-of-the-herring-alliance-on-the-new-england-fishery-management-council-nefmc-voting-to-protect-atlantic-herring-8589935244

[2] See Am 5 DEIS at page 366 explaining that the Standardized Bycatch Reporting Methodology (SBRM) Amendment governing observer coverage in Northeast U.S. fisheries was recently vacated in response to a federal court ruling, at page 486 acknowledging the high degree of uncertainty in river herring removals estimates, and at page 415 illustrating that in 2010 over 450,000 pounds of catch in the fishery could not be identified to species (i.e. was classified as "Herring, Not Known" or "Fish, Not Known."

[3] See Final Rule implementing Amendment 4 to the Herring FMP, available at http://www.nero.noaa.gov/nero/regs/frdoc/11/11HerAmend4FR.pdf which includes an analysis showing that between 2001 and 2009, management area closure thresholds were exceeded on 8 of 36 occasions, and NMFS quota monitoring reports at http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm showing that this trend has continued in recent years, with cascading overages in management Area 1B of 138% (2010) and 156% (2012).

[4] See Am 5 DEIS at page 414

[5] See Am 5 DEIS at page 415 illustrating extent of catch not identified to species level due to dumping, and at page 419 illustrating that most at-sea dumping is not necessary

Council in April 2011.[6] Newly available data also demonstrate that far too much of this problem results from fishing by MWT vessels in the GFCA's.[7] Finally, troubling evidence of the extent of seafloor contact by MWT gear has emerged, validating concerns that, contrary to MWT industry claims, their gear is being fished in close proximity to rebuilding groundfish populations.[8]

- River herring populations remain in a severely depleted state, and ocean catch in federal waters has been firmly identified as an ongoing threat to these fish.[9] The Atlantic States Marine Fisheries Commission (ASMFC) has implemented aggressive conservation measures in state waters up and down the coast, but while it initially considered protections for federal waters, it ultimately did not adopt any, placing the responsibility squarely on the NEFMC and other federal management entities.[10]
- Additional developments since the initiation of Am 5 demonstrate the extent and severity of the threat to river herring populations and highlight the Council's duty to act. First, NMFS recently determined that a listing of river herring species as "threatened" under the Endangered Species Act may be warranted.[11] Second, a federal judge ruled that NMFS and the Council's prior decision not to include river herring and shad as stocks in the Herring FMP was illegal, and makes clear that the Council needs to add catch limits (or caps) and other protections for river herring and shad.[12]

Overwhelming stakeholder and public comment has again flooded into NMFS and the NEFMC citing all of the above concerns and reiterating the same calls for action that were expressed in 2007, this time in support of the specific management proposals in Am 5 that will deliver real reform. Specifically, over 40,000 comments have been received to date, the vast majority of them supporting 100% observer coverage on Category A and B herring vessels, the strongest possible dumping controls mirroring those currently in place under a pilot program in Groundfish Closed Area I, a requirement to accurately weigh all landings, a prohibition on MWT access to GFCAs, and the immediate establishment of a river herring catch cap.[13] At a series of public hearings up and down the East Coast, hundreds of concerned fishermen and other

---

[6] See Final Framework 46 to the Northeast Multispecies FMP at http://www.nefmc.org/nemulti/frame/fw%2046/110617_FW_46_Resubmission.pdf

[7] See Am 5 DEIS at page 490

[8] See transcript of NEFMC Herring Oversight Committee meeting on 9/1/2010 pages 185-190 at http://www.fishtalk.org/rc/nefmc/species/herring/transcripts/20100901_herring_am5_nefmc_os.pdf

[9] *See ASMFC* River Herring Benchmark Stock Assessment, Executive Summary, and peer review report at Page 8.

[10] See *A Federal Offense: River Herring Robbery* at http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Fact_Sheet/River_herring_map_FINAL.pdf

[11] In response to a petition filed by the National Resources Defense Council (NRDC), NMFS made a 90 day finding that a listing may be warranted. 76 Fed. Reg. 67652 (Nov. 2, 2011). Listing petition available at http://switchboard.nrdc.org/blogs/bsewell/NRDC%20Petition%20to%20List%20Alewife%20and%20BB%20Herring%208-1-11.pdf

[12] *See Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 8, 2012) and available at http://earthjustice.org/documents/legal-document/pdf/herring-a4-decision-kessler

[13] See Am 5 summary of written comments to date at http://www.nefmc.org/herring/cte%20mtg%20docs/120606/Final%20AM%205%20Comment%20Summary%20Memo%20June%206%20OS%20Mtg.pdf

members of the public took time to tell Council members in person of their support for these important reforms.[14]

Atlantic herring, river herring, and the shad species are all critical forage stocks which support the marine food web in the Northeast Shelf Ecosystem. As such, their abundance and availability (presence or absence) reverberates through the ocean and through coastal economies. Whether as targets of traditional fisheries in and of themselves, as prey for a large and diverse set of commercially and recreationally valuable fish stocks, or as food for marine mammals and seabirds, their importance cannot be understated. In the last year alone we have seen three seminal scientific reports highlighting the importance of conserving forage species.

A study released in July 2011 by Smith et al. demonstrated that fishing on forage species can have significant negative impacts on marine ecosystems and in particular commercial and recreationally valuable species.[15] The study went on to recommend management reference points and exploitation rates for existing forage fisheries that are twice as conservative as the traditional maximum sustainable yield approach.

In November 2011 a study was published by Cury et al. that found when forage fish biomass falls below one third of the maximum historical biomass, seabird populations respond by producing fewer chicks.[16] Most surprising here is that the predator response was consistent across ecosystems and seabird species. Of importance to resource managers is that this study provides a threshold of minimum forage species biomass needed to sustain seabird populations and productivity over the long term.

In April 2012, the Lenfest Forage Fish Task Force, a group of 13 preeminent scientists from around the globe, released a report providing practical, science-based recommendations for the management of forage species, given their critical role in marine ecosystems and the need to transition toward an ecosystem-based approach to fisheries management. The report demonstrated that forage fish are twice as valuable left in the water as in the net due to the reliance of commercially-valuable species such as tuna and cod on healthy forage fish populations.[17] The report also raised warnings about the vulnerability of forage fish populations to collapse. It recommended severely restricting fishing pressure for data-poor forage stocks (which may be particularly relevant in the case of the alosines in the Atlantic herring fishery) and it stressed that spatial and temporal closures may be needed to protect ecosystem function, another finding of importance to managers as they consider the time-area closures proposed in Am 5 to protect river herring and groundfish.

---

[14] See Am 5 Public Hearings Summary at http://www.nefmc.org/herring/cte%20mtg%20docs/120606/Amendment5PublicHearingSummaries.pdf

[15] Smith ADM et al 2011. Impacts of Fishing Low–Trophic Level Species on Marine Ecosystems. *Science* **333** (6046): 1147-50, 26 August 2011 (published online July 21, 2011); available at www.sciencexpress.org.

[16] Cury, P.M. et al. 2011. "Global Seabird Response to Forage Fish Depletion – One Third for the Birds." Science 334:1703-06

[17] Pikitch, E., et al. 2012. Little Fish, Big Impact: Managing a Crucial Link in Ocean Food Webs. Lenfest Ocean Program. Washington, DC

Catch limits and catch accounting through monitoring are the bedrock of modern fisheries management in this country and around the world. This amendment must establish limits for the stocks that are involved in this fishery but which as yet lack limits (river herring and shad) and it must ensure comprehensive monitoring of the industrial trawl fleet at work in New England (Category A & B).

On the following pages we describe our preferred Am 5 alternatives in the order presented in the DEIS. Within each section we present our highest priorities first.

Section 3.1: Proposed Adjustments to the Fishery Management Program

The most critical priorities of the Council for this section must be those actions that will improve the monitoring of catch in the fishery. While this section mainly proposes refinements to various self-reporting mechanisms (as opposed to true catch monitoring, which should be done by trained, independent third-party personnel such as fishery observers) and other administrative changes to the FMP, there are two proposed measures in Section 3.1 that are of particular importance to catch monitoring. The first is to require the accurate and verifiable weighing of catch. The second is to carefully avoid the creation of potential loopholes in the catch monitoring program through the encouragement of unnecessary new effort in the fishery. In many fisheries the veracity of catch reporting benefits from the opposing interests of those that catch and those that purchase the fish. Such is not the case in the industrial herring fishery where, due to vertical integration, under-reporting can be in the interest of both the seller and the buyer because they are essentially the same entity. We support the following measures in Section 3.1:

- **Section 3.1.5 Option 2** (Dealers must accurately weigh all landed fish) with all of the following Sub-Options:
    - Sub-Options 2A: (Annual documentation of catch composition estimation methodology)
    - Sub-Options 2B: (Weekly[18] reporting of catch composition estimation for each individual landing)
    - Sub-Options 2C: (Dealer participation in SAFIS with vessel error-checking through Fish-on-Line)

  Standardizing the methods by which dealers weigh all catch, and requiring vessels to verify the amount of fish landed, will aid in better overall estimates of catch, in addition to being essential for ensuring that directed quotas are not exceeded. Improved data on landings will also aid in the monitoring of a mortality cap or in achieving the objective of better catch estimates of river herring and shad. As the Draft Environmental Impact Statement (DEIS) for Amendment 14 (Am 14) to the Squid, Mackerel and Butterfish (SMB) Fishery Management Plan (FMP) points out, "accurate monitoring of the target

[18] Note that the Am 5 DEIS narrative description of Sub-Option 2B on page 29 does not specify that weekly submission of landing event reports is required, however the description of this sub-option in the Executive Summary on page xvi does specify that this is a weekly reporting requirement.

species can be as important as determining the encounter rates of [river herring and shad]" in the determination of river herring and shad catch estimates, due to the use of discard-to-kept ratios, or bycatch/incidental catch ratios, for catch estimation.[19]

Dealer or vessel self-reporting of unverifiable, un-standardized "hail" weights or visually-based volumetric estimates is inadequate and unacceptable. These status-quo methods present far too much opportunity for deliberate or accidental mis-reporting, they are not standardized, and offer no opportunity for third-party observers, port samplers, or law enforcement personnel to verify that accurate and complete catch weights are being reported.

Sub-Option 2A is basically a simple Catch Monitoring and Control Plan[20] (CMCP) under which each dealer would be required to explain, in an annual report to the National Marine Fisheries Service (NMFS), how that dealer estimates the amount of bycatch in an unsorted (bait) landing. Sub-Option 2B would require dealers to compile species-specific reports for each landing event and submit them once a week.[21] Sub-Option 2C will facilitate the process of cross-checking dealer reports against vessel reports and speed up timeliness of data processing. In the absence of third-party landings verification, which is not proposed in Am 5, cross-checking is a necessary (if fallible) backstop to identify and prevent misreporting.[22]

The Council should consider modifying this entire option to include as much third-party verification of landed catch weights as possible. In fact, the most powerful aspect of requiring a verifiable weight or verifiable volumetric proxy is that it can be verified by a third-party observer. This is not the case for the current captain's "hail" weight or captain/dealer visual volumetric estimate. There are simple solutions the Council could include. For instance, the Council could require that NMFS Observers, when present on a trip, remain with the vessel throughout the offloading operation to verify the landed weight. With 100% observer coverage and calibrated holds, considerable efficiency could be gained through involving on-board observers in objective catch estimation before off-load. This is another obvious benefit of 100% observer coverage on A & B vessels.

- **Section 3.1.6 Option 1** (No Action- no increase in open access herring possession limits)

  No changes to current open-access possession limits in the Herring FMP are necessary or justified. Furthermore, to implement any of the proposed changes would potentially undermine the catch monitoring reforms proposed in this amendment through the creation of significant new additional herring fishing effort that might not be appropriately included in the monitoring program.

[19] See Amendment 14 DEIS, page 279
[20] See Am 5 DEIS at page 94
[21] See footnote 1 regarding the need for the Council to clarify this sub-option
[22] See Am 5 DEIS at page 353 which explains that Sub-Option 2C is "designed to identify erroneous data discrepancies between dealer and vessels reports" including through NMFS follow-up.

The information in Am 5 is clear, stating that "available fishery data do not indicate that the current 3 [metric ton] possession limit of herring for open access permit holders is problematic at this time" and that this possession limit "does not appear to be resulting in bycatch/regulatory discards for vessels fishing in any of the management areas."[23]

Furthermore, the herring fishery may have overcapacity concerns already, including in the sensitive inshore grounds of Area 2 and also the inshore portions of Area 3. This is illustrated most recently by the 2012 Mackerel Advisory Panel Fishery Performance Report, which cites industry statements that the directed mackerel fishery in 2012 effectively experienced a premature closure due to rapid harvest of the available herring quota in Herring Management Area 2.[24]

- **Section 3.1.1 Option B** (Adopt new fishery definitions)

- **Section 3.1.2 Option B** (Adopt Administrative/General Provisions) Sub-Options as follows:
  - Option 2A (Expand possession restrictions to vessels working cooperatively)
  - Option 2B (Eliminate the VMS power-down provision)
  - Option 2C (Establish an At-Sea Herring Dealer permit)

- **Section 3.1.3.2 Option 2** (Require VMS for carriers)

- **Section 3.1.3.3 Option 3** (Restrict At-Sea Transfers to only permitted herring vessels)

- **Section 3.1.4 Option 2** (Expand pre-trip notification requirements) and **Option 3** (Expand pre-landing notification requirements)*

We support all of the measures above since it appears that they will improve catch reporting and some may indirectly support catch monitoring by providing a better understanding of overall fleet activities. However we caution that unverified self-reporting should not be a substitute for robust third-party catch monitoring, especially for the Category A and B vessels that catch the vast majority of the fish.

The proposed new fishery definitions appear to be reasonable and necessary; however we caution that the top priority of the Council and NMFS relative to this section must be to ensure that no loopholes are created which allow catch to inadvertently fall through the cracks of new monitoring requirements instituted through Am 5. For instance, it appears that some At-Sea Transfers are actually also offloads, and the Council should clarify this issue.

[23] See Am 5 DEIS at page 357

[24] See 2012 Industry Performance Report. Available at: http://www.mafmc.org/meeting_materials/SSC/2012-05/1-Staff_2013_MSB_ABC_Memo.pdf, Page 5-6.

We support Option 3 in Section 3.1.3.3 since it will likely allow managers to better understand the practice of at-sea transfer (AST) by requiring all participating boats to have a herring permit, and thus to report their activities more robustly. We oppose Option 2 since it would appear to restrict the practice of AST to only the largest vessels in the fishery, at the expense of traditional small boat herring fishermen.

* The Council should consider modifying Options 2 and 3 in Section 3.1.4 to specify that the pre-trip and pre-landing notification requirements also apply to Category D vessels fishing with midwater trawl gear in all herring management areas (Option 2 already proposes applying it to them in Areas 1A, 1B and 3). Fishery stakeholders and the public have expressed serious concerns about MWT bycatch that apply to the entire herring fishery, across all management areas, and it appears there may be some large MWT vessels that are mainly active in the mackerel fishery but that possess Category D herring permits. Requiring pre-trip and pre-landing notifications from all MWT vessels in all areas would facilitate placement of observers and portside spot-checks by NMFS Office of Law Enforcement (OLE).

Section 3.2: Catch Monitoring: At-Sea

The Council's highest priorities in this section should be to approve a robust at-sea observer program for the largest vessels in the herring fleet: the large midwater and midwater pair trawl vessels operating with Category A and Category B permits. The Council should require 100% observer coverage on these vessels. In addition the Council should close loopholes in current regulations that undermine the accuracy, precision, reliability and completeness of observer data. Some of these loopholes are simple, and easy to fix. For instance, the Council should explicitly and firmly abandon the practice of placing an observer on only one vessel in a pair trawl operation. Others are somewhat more complex, such as those that allow significant amounts of catch to be discarded at sea prior to being sampled by observers. The Council should approve a system to reduce and limit this practice, known also as "dumping" or "slipping" catch. Such a system must have three critical parts: 1) a prohibition on the practice except when necessary, 2) a set of limited exceptions under which catch may be dumped, and most importantly, 3) a set of accountability measures, consisting of concrete disincentives, that apply when the exceptions are exercised to discourage abuse of the exceptions. It should also be considered that with 100% monitoring, the independent estimation of the soon-to-be landed target catch could easily be carried out by appropriately trained at-sea observers during or upon the return to port. This could be done by inspection of certified/calibrated holds (standardized volumetric proxy for actual weight) and could reduce some of the administrative and economic burden contemplated under Reporting Requirements (section 3.1.5).

We support the following measures in Section 3.2:

- **Section 3.2.1 Alternative 2** (100% At-Sea Observer coverage on Limited Access herring vessels, Category A and B only) with the following sub-options:

- Funding Option 2 (Federal and Industry funds)
- Service Provider Option 1 (No Action)
- No issuance of waivers (no fishing would be allowed without an onboard observers)[25]

Between 2007 and 2010, Category A and B vessels caught 98% of the fish in the fishery, and realized 98% of the fishery revenues.[26] Clearly this sector of the fishery is the most important one to monitor, and the one best equipped to handle the costs. It is also a relatively small fleet sailing a relatively small number of trips: Between 2008 and 2010, an average of only 48 vessels held Category A and B permits, and of these only 30 were actually active in the fishery (defined as landing more than one pound of herring per year), sailing an average of only 650 trips per year.[27]

The public and fishery stakeholders have overwhelmingly supported this measure. In fact, the Am 5 Public Comment Summary released on June 1, 2012 states that support for 100% observer coverage on Category A/B vessels was "one of the most common comments from many individuals, fishermen, industry and [stakeholders] alike."[28]

The simple fact is that vessels of this size and fishing power, fishing with a small-mesh gear prone to catastrophic bycatch events of depleted species like river herring, require very high levels of observer coverage. In fact, the only two comparable fleets in the U.S., the west coast MWT fishery for Pacific whiting (hake) and the Alaska pollock (walleye) MWT fishery, both employ mandatory 100% at-sea observer coverage.[29]

The Am 5 DEIS recognizes that "overall, the benefits to the Atlantic herring resource would likely be greatest under Alternative 2 relative to the other alternatives because it proposes the highest level of observer coverage and increases the likelihood of better documenting herring catch."[30] The DEIS states much the same for non-target species in the fishery, such as river herring.[31] We would submit that by providing the greatest benefit to target and non-target species, this alternative provides the greatest net benefit to all components of the fishery, including herring harvesters, herring processors, and the stakeholders who rely on herring in the water as prey for other species. The DEIS, in section 5.2.6 (impacts of observer coverage alternatives on fishery-related businesses and communities), cites the positive impacts on herring harvesters and processors, and on

[25] While the Am 5 DEIS (see page 35) does not explicitly describe labeled options allowing or disallowing the issuance of waivers, it does describe these two possibilities and request public comment on the issue
[26] See Am 5 DEIS Table 52 on page 231
[27] See Am 5 DEIS page 225 and page 250
[28] See page 2 of Am 5 summary of written comments to date at http://www.nefmc.org/herring/cte%20mtg%20docs/120606/Final%20AM%205%20Comment%20Summary%20Memo%20June%206%20OS%20Mtg.pdf
[29] See Electronic Code of Federal Regulations Part 660.140, Part 660. 150 and 660.160 (Whiting) and Part 679.50 (Pollock)
[30] See Am 5 DEIS at page 370
[31] See Am 5 DEIS at page 381

other components of the fishery that rely on herring as prey, that would result from increased observer coverage and the reductions in scientific and management uncertainty it would produce.[32]

We support Funding Option 2, under which an industry-funded observer program would be implemented to meet the goal of 100% coverage in cases when federal funds were unavailable. A number of herring harvesting and processing entities, along with the vast majority of other herring fishery stakeholders, have supported this option.[33] We are opposed to "grandfathering" all states in the Northeast Region as service providers for sea sampling and we are opposed to the issuance of waivers which would essentially nullify any requirement for 100% observer coverage in the fishery. No states are currently providing observer services and as such none have acquired NMFS approval as service providers.[34] Therefore the very concept of "grandfathering" is not applicable. Absent full certification by NMFS of any state wishing to provide observer services, NMFS and the public would have no assurances that the states would comply with NMFS data collection, processing, management, sharing, and transparency standards. As the Am 5 DEIS points out, their "operational details would be unknown."[35] This is not an acceptable scenario, and even the Northeast Observer Program (NEFOP) opposes this option.[36] Finally, one hundred percent coverage must mean just that: 100%. A blanket provision allowing the unlimited issuance of waivers with no backstops or other accountability measures is likely to seriously undermine any 100% coverage requirement or other target coverage level.

- **Section 3.2.3 Option 4D** (Closed Area I Provisions with Trip Termination)

Effective conservation and management of Atlantic herring, river herring, and other marine resources in a manner consistent with the Atlantic herring FMP and the Magnuson Stevens Act require that the wasteful, unnecessary and data-undermining practice of at-sea dumping be reduced and limited. Only Option 4D will effectively do so, and we urge the Council to approve this measure, which is based closely on a highly successful pilot program in CAI that has proven to effectively control dumping without undue impact on herring fishery operations.

The Council should also explicitly clarify that, consistent with the current CAI sampling regulations, under Option 4D operational discards a) must be brought aboard for sampling, b) may only be dumped under one of the other three allowable exceptions (safety, mechanical failure, and spiny dogfish clogging the pump) and c) if dumped would be subject to the accountability requirements outlined in the measure (the dumping

[32] See Am 5 DEIS at page 391
[33] See Am 5 written comment compilations at http://www.nefmc.org/herring/cte%20mtg%20docs/120606/HR%20A5%20COMMENTS%20NEFMC%20.pdf and http://www.nefmc.org/herring/cte%20mtg%20docs/120606/HR%20A5%20COMMENTS%20NERO.pdf
[34] See Am 5 DEIS at page 394
[35] Ibid
[36] Ibid

event would be tallied toward the fleet-wide allowance of 5 dumping events per herring management area, and subsequent dumping would trigger a requirement to terminate the trip and return to port). We point out that in January 2011, the NEFMC passed a motion clarifying that any reference to current federal regulations (i.e. the current CAI provisions) in the Am 5 document refers to those regulations as specifically codified in the CFR, which indicates that Option 4D must treat operational discards as they are treated under current CAI rules.[37]

NMFS has acknowledged a) that accurate catch composition records cannot be obtained for dumped catch (including operational discards), b) that there are safe and operationally-feasible ways to get all catch aboard for sampling (including operational discards), and c) that issues such as stratification of catch in the cod-end or the strainer-like effect of the fish pump intake grate raise serious questions about the composition of operational discards.[38] Taken together, these issues clearly demonstrate that current regulations allowing dumping undermine conservation objectives of the herring FMP.

At-sea dumping of unobserved catch, sometimes referred to as slippage or released catch and including the aforementioned operational discards, is an ongoing problem in the Atlantic herring fishery. Furthermore, the CAI rules currently in place in this fishery provide a compelling example of successful accountability measures for dumping. Between 2008 and 2009, nearly 30% of observed hauls in the Atlantic herring fishery included dumped catch that was not sampled, and even this is acknowledged as an underestimate because vessel captains did not provide information on dumped catch on all observed hauls.[39] In contrast, vessels fishing under Closed Area I (CA1) regulations in the Atlantic herring fishery had no observed slippage events recorded in 2010.[40] This reduction in dumping clearly demonstrates that the CAI rules are effective. It is important to note, however, that this effectiveness is due to the accountability measures in place to discourage abuse of the dumping exceptions, which require a vessel to stop fishing and exit CA1 if it releases an un-sampled net. This accountability approach must be retained and therefore the measure must be effectively translated from one that is custom-crafted to apply to CAI to one that works for the entire fishery.

The hybrid approach, which grants a fleet-wide allowance of dumping events per herring management area, to be followed by a trip termination requirement, is a sensible and justified solution. The proposed fleetwide allowance is neither arbitrary nor unreasonable. As the Am 5 DEIS points out, observed dumping events in the fishery in past years are not unreasonably out of proportion to the proposed allowance under Option 4D, especially if one considers the probable elimination of unnecessary dumping that will

[37] See summary of NEFMC motions from January 2011 at http://www.nefmc.org/actions/motions/motions-jan11.pdf

[38] *See* Final Rule entitled **Fisheries of the Northeastern United States; Discard Provision for Herring Midwater Trawl Vessels Fishing in Groundfish Closed Area I,** Federal Register November 30, 2010 available at http://www.nero.noaa.gov/nero/regs/frdoc/10/10HerMultiClosedAreaIMidWaterDiscard.pdf

[39] *See* Am 5 DEIS at pages 408-409

[40] *See* Am 5 DEIS at page 414

result from the new rules driving behavioral changes.[41] Given the buffer against trip termination provided by the dumping allowance, the three exceptions provided under which dumping could occur, and the success to date of the CAI pilot program (no trips were required to leave CAI in 2010, and to date there have been no reports of safety or operational problems in 2011, the first year in which operational discards were required to be brought aboard) Option 4D provides a reasonable balance that will deter slippage without undue penalty.

- **Section 3.2.2 Option 2** (Implement Additional Measures to Improve Sampling) Sub-Options as follows:
  - Sub-Option 2A (Provide a Safe Sampling Station)
  - Sub-Option 2B (Provide Reasonable Assistance)
  - Sub-Option 2C (Provide Notice of Starting Pumping Operations)
  - Sub-Option 2E (Improve Communications between Pair Trawl Vessels)

  We support the measures listed above as they will improve catch sampling by at-sea observers.

  We oppose Sub-Options 2D (Requirements for Trips with Multiple Vessels) and 2F (Visual Access to the Net/Codend).

  We oppose Sub-Option 2D, which would seemingly require a sensible step (the deployment of an observer on both vessels of any pair trawl trip assigned observer coverage) because it contains an unacceptable loophole (the inclusion of the phrase "wherever/whenever possible"). Since a pair trawling operation is considered one trip by NEFOP, and since NEFOP has stated that it already adheres to this policy, this is one of the simplest monitoring reforms that can and should be applied to the fishery. Pumping of catch to an unobserved vessel in a pair trawl team is one of the largest culprits in the widespread problem of the "Fish, Not Known" category that undermines catch composition data in the fishery.[42]

  We also oppose Sub-Option 2F, which would require vessel operators to provide "visual access" to the net for observers. This is an entirely unacceptable, loophole-ridden variation on status-quo, and will not allow for any actual catch sampling. NMFS has acknowledged that so-called visual access does not allow reliable catch estimation, stating in the Final Rule implementing the revised CAI sampling requirements that absent the catch being brought aboard "species identification of fish remaining in the net is not typically possible. Observers may be able to identify large-bodied organisms in the net, but are unable to reliably differentiate many fish to their species. Even if fish at the

[41] See Am 5 DEIS at page 433
[42] See Am 5 DEIS at page 418

surface of the net are identifiable, the contents may not be homogeneous and the observer cannot determine the full composition of the net."[43]

Section 3.3: Management Measures to Address River Herring Bycatch

The Council must take proactive action in Am 5 to conserve and manage severely depleted alosine[44] species that are clearly involved in the fishery and are indisputably in need of conservation and management. Specifically, these stocks are currently caught, killed, and in most cases harvested from the Exclusive Economic Zone (EEZ, the federally managed ocean waters between 3 and 200 miles from shore), in very large numbers, by vessels in the Atlantic herring fishery. Most are then landed and even sold, yet there are no federal regulations of any kind to manage this impact. The Council must accept responsibility for this unmanaged mortality and approve measures to monitor, reduce and limit it through the implementation of new regulations on the Category A and B vessels that catch the vast majority of the fish and realize the vast majority of the revenue in the fishery.

Please note that while there are river herring-specific monitoring measures proposed in this section, for instance options to apply higher levels of observer coverage or limit at-sea dumping, these would apply only to certain areas identified as river herring bycatch "hotspots" (referred to in the DEIS as the "River Herring Monitoring/Avoidance Areas"). Even worse, in some cases these proposed measures would apply only after large amounts of river herring bycatch were detected on a fleet-wide basis (the so-called "trigger" approach). We oppose all of these measures because the Council should not limit the application of a robust monitoring program for the vessels catching most of the fish in this fishery to these limited areas. The Category A and B vessels must be monitored robustly in all times and areas, including 100% at-sea observer coverage and a system to control at-sea dumping, not just in river herring hotspots. Robust monitoring of river herring catch will be delivered by fishery-wide monitoring measures for the Category A and B fleet, which the Council should select and approve from Section 3.2 as we outline earlier in this letter. The Council must focus its efforts in this section on measures to both reduce (utilizing hotspot closures) and limit (utilizing a catch cap) the catch of severely depleted river herring and shad by vessels engaged in directed herring fishing.

Therefore we support the following measures to address river herring catch and bycatch in this section.

- **Modified Section 3.3.5** (An immediate catch limit, or cap, on the total amount of river herring and shad caught in the directed Atlantic herring fishery, with cap amounts based on the median annual river herring and shad catch by management area using a 3 or 5

[43] *See* Final Rule entitled **Fisheries of the Northeastern United States; Discard Provision for Herring Midwater Trawl Vessels Fishing in Groundfish Closed Area I,** Federal Register November 30, 2010 available at http://www.nero.noaa.gov/nero/regs/frdoc/10/10HerMultiClosedAreaIMidWaterDiscard.pdf

[44] Alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*) and hickory shad (*Alosa mediocris*)

year window, with a provision for updating the cap through specifications based on new scientific information as it becomes available.)

- **Modified Section 3.3.5** (Add river herring and shad as "non-target stocks in the fishery" with immediate initiation of an action to establish the status determination criteria and other required management measures.)
- **Section 3.3.3.2.1 Option1** (Closed Areas: Close River Herring Protection Areas ("hotspots") to directed herring fishing). Since the "River Herring Protection Areas" that would be closed under this option are relatively small, the Council should approve **Section 3.3.4** to allow for a future expansion, through a Framework Adjustment, of the closures to the larger "River Herring Monitoring/Avoidance Areas" if appropriate.

The Council and NMFS are legally obligated to add river herring and shad to the Atlantic herring fishery management plan. *See Flaherty v. Bryson*, 2012 WL 752323, *13 (D.D.C. Mar. 8, 2012). Until they are added to the plan with fully implemented status determination criteria and other legally required measures, the Council must take immediate action to decrease the incidental catch of river herring and shad in the Atlantic herring fishery. *Id.* at *16. These measures must be accompanied by the application of a robust monitoring program with 100% at-sea monitoring and a system to control dumping. In addition to adding river herring and shad as stocks in the fishery of the Atlantic Herring FMP (discussed further below), we support the following alternatives as interim measures to reduce incidental catch of river herring and shad:

Until River Herring and Shad are Fully Integrated into the FMP the Council Must Establish a River Herring and Shad Catch Cap

We support a modification of Alternative Section 3.3.5. It should be modified to implement an immediate cap for all alosines (river herring and shad, or "River Herring") based ou the 3 or 5 year median annual river herring and shad catch by management area, with a provision for updating the cap based on new scientific information as it becomes available (through specifications). The Amendment 5 record and DEIS fully support approval of this modified alternative, and the Council has the authority and the legal obligation to initiate this cap immediately. *See Flaherty v. Bryson,* 2012 WL 752323 at *16 ("to meet their responsibility to ensure compliance with the National Standards, Defendants must demonstrate that they have evaluated whether the FMP or amendment minimized bycatch to the extent practicable.")

Amendment 5 has been developed to address the widely-recognized need to reduce bycatch in the Atlantic herring fishery and has specifically identified River Herring as a key issue to be addressed.[45] River Herring are caught, killed and either landed or discarded in federally-managed waters between 3 and 200 miles from shore by vessels in the Atlantic herring fishery. Although the majority appears to be landed and sold with Atlantic herring and mackerel, there are no meaningful federal regulations under any fishery management plan that manages this catch. The Council must take responsibility for this unmanaged mortality in the herring fishery and approve measures that will improve monitoring, reduce bycatch/incidental catch, and establish catch caps/limits for these species, especially for the Category A and B vessels that

[45] *See* 74 Fed. Reg. 68577 (Dec. 28, 2009).

catch the vast majority of River Herring and realize the vast majority of the revenue in this fishery.

The Herring Alliance has previously requested a catch cap for River Herring.[46] As noted by the PDT report referenced below, catch caps are often based on recent catch history when it is decided not to use an existing stock assessment for establishing a catch limit or one is not available. This would provide strong incentive to avoid River Herring and help to minimize its overall catch. For guidance on various analyses, please see the document prepared for the Atlantic Herring PDT entitled *Developing River Herring Catch Cap Options in the Directed Atlantic Herring Fishery*[47] and contained in Volume II of the DEIS for Amendment 5, particularly Table 4 which provides Sub-Options for River Herring Catch Triggers by Area.

Until River Herring are Fully-Integrated into the FMP, the Council Must Implement Hotspot Closures

The New England Council has identified a variety of "River Herring Protection Areas" (relatively small) and "River Herring Monitoring/Avoidance Areas" (larger) in Amendment 5 as areas where river herring interactions are high. As an immediate interim measure until river herring and shad ("River Herring") are fully integrated into the FMP, herring vessels should be excluded from the River Herring Protection Areas. **With modifications, we support Alternative Sections 3.3.3.2.1 and 3.3.4.**

Alternative Section 3.3.3.2.1 should be modified to clarify that "directed fishing for herring" in these closures means herring-permitted vessels fishing for, possessing, catching, transferring or landing more than 2,000 pounds of herring from the River Herring Protection Areas on all fishing trips. In addition, it should also be modified to reflect that Category C & D permits will not be affected by these closures if not carrying gear capable of catching Atlantic herring.

Although we support the closures identified, we are opposed to the sub-option which allows a vessel to "declare out of the fishery" because it provides a loophole for limited access herring vessels to avoid having to comply with the Closed Areas prohibition. Alternatives 3.3.3.2.1 and 3.3.3.2.3 already provide appropriate exemptions, although the exemptions under 3.3.3.2.1 should be clarified to include vessels not fishing with mesh gear (e.g. hook and line). If adopted, this is an area where the NEFMC and the MAFMC should coordinate their actions in Amendment 5 and Amendment 14 so that all small-mesh gear types capable of catching River Herring are prohibited from fishing in the closed areas, regardless of the target species.

> Because the hotspots closed under Alternative 3.3.3.2.1 are relatively small, the Council should also approve Section 3.3.4 which allows for future expansion or modification, through a Framework Adjustment. The closure of larger "River Herring Monitoring/Avoidance Areas" should be considered, as well as other areas if justified

[46] *See* January 21, 2011 Letter from Herring Alliance to Executive Director NEFMC re: Capping River Herring Catch in the Atlantic Sea Herring Fishery.
[47] Amendment 5 DEIS, Volume II, Appendix VII, pp. 362-376.

through further analyses, including data from 100% monitoring of the fishery. Based on various analyses provided in Volume II of Amendment 5 DEIS, closing the protection areas will help to minimize bycatch of river herring and shad populations in the short-term; however, the distribution of these species is likely too variable for these small closed areas to be effective, especially standing alone, in the long-term. **We oppose the trigger-based closures under this alternative because the Council should not limit its application of a robust monitoring program to those limited areas for the vessels catching most of the fish in this fishery.** Category A and B vessels must be monitored robustly at all times and in all areas, including through 100% at-sea monitoring with a system to control at-sea dumping, not just in river herring hotspots. Further, because herring and mackerel are often targeted by the same vessels at the same time, the Council should coordinate these closures with the MAFMC to ensure consistency.

The Council Cannot Rely on a Voluntary Bycatch Avoidance Program such as the SFC/SMAST/DMF Project described in Alternative 3.3.2.2.4 to Satisfy its National Standard 9 Obligation to Minimize Bycatch

Any voluntary bycatch avoidance program, such as the SFC/SMAST/DMF Project described in Alternative 3.3.2.2.4, a University-based voluntary program, is inappropriate as a regulatory measure and would be ineffective without a mortality cap. This alternative contemplates a "stand-alone approach for river herring bycatch" and must be removed from consideration in Amendment 5. There are simply no meaningful incentives to avoid bycatch through the program without a cap. Any positive results from the program to date are the result of the incentive to avoid meaningful regulation through this amendment, and will disappear as soon as Amendment 5 passes. The bycatch avoidance program for the Atlantic scallop fishery is successful at reducing bycatch only because there is a yellowtail flounder cap that scallop fishermen must avoid to continue fishing.

The Council Must Add River Herring and Shad to the Atlantic Herring FMP

The Magnuson-Stevens Act requires federal FMPs to describe the fish stocks involved in a fishery, and NMFS and the councils to manage those stocks in need of conservation and management. [48] FMPs must contain conservation and management measures consistent with the

[48] The Magnuson-Stevens Act requires an FMP or an amendment for those fisheries requiring "conservation and management." *See* 16 U.S.C. §§ 1852(h)(1); 1853(a)(2). For purposes of determining which target and non-target stocks require conservation and management, the Act provides a definition of "conservation and management" at 16 U.S.C. § 1802(5). *Id.* at *1, fn 3. This definition should be looked to for guidance in making decisions about what stocks belong in a FMP, and refers to rebuilding, restoring, or maintaining "any fishery resource and the marine environment," assuring among other things, a food supply, recreational benefits, and avoiding long-term adverse effects on fishery resources and the marine environment. National Standard 7 guidelines include a set of criteria for determining whether a fishery needs management that tracks this statutory definition and other MSA objectives and requirements, including examination of the condition of the stock or stocks of fish. The criteria also note that "adequate" management by an entity like the ASMFC could be one factor in determining whether a stock should be added to a fishery. In this case, although ASMFC management was noted by NMFS during briefing the *Flaherty v. Bryson* case, the Court did not address it in its opinion because (as even NMFS recognized) the ASMFC plan does not address federal waters. 50 C.F.R. § 600.340(b).

National Standards, including National Standards One and Nine which require management measures that prevent overfishing and minimize bycatch.[49] The Act requires annual catch limits (ACLs) and accountability measures (AMs) for *all* stocks in need of conservation and management.[50] To prevent overfishing the National Standard One Guidelines require councils to identify the stocks in the fishery, including non-target stocks caught incidentally and retained or discarded at sea.[51] A stock can be identified in more than one fishery.[52] Identification as a stock in the fishery triggers ACL requirements and the standard approach to setting ACLs contained in the National Standard 1 Guidelines. NMFS must review council decisions to ensure that they comply with the Act, and disapprove those that do not.

The question of which stocks must be included in the Atlantic herring FMP was recently addressed in federal court. *See Flaherty,* 2012 WL at *13 (holding that the Magnuson-Stevens Act requires Councils to prepare an FMP or amendment for any stock of fish that "requires conservation and management."). Councils must make two determinations: (1) which stocks can be treated as a unit for purposes of management, and therefore should be considered a fishery, and (2) which of these fisheries then "require conservation and management." *Id.* at *9. The law does not allow managers to unreasonably delay decision-making regarding the appropriate composition of a fishery given their statutory obligations to ensure that overfishing does not occur. *Id.* at *12. The court also rejected any interpretation of the National Standard One Guideline found at 50 C.F.R. § 600.310(d)(1), as providing the Council with unreviewable discretion to determine what stocks belong in an FMP. *Id.* The Court held that while the Council's role is to name the species to be managed "in the first instance," NMFS has a duty "in the second instance" to ensure an FMP, including the composition of its fishery, satisfies MSA requirements. *Id.* at **13, 14. Moreover, Councils and NMFS cannot limit the stocks they include in a fishery to just those stocks that already happen to be part of an FMP, or those they have officially designated as overfished (or where overfishing is occurring). *Id.* at **12-14.

[49] 16 U.S.C. § 1851(a)(1) & (9).
[50] *Id.* § 1853(a)(15).
[51] 50 CFR § 600.310(d)(3), (4). A "fishery" is defined as "one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics." *Id.* § 1802(13). A "stock of fish" is defined as a "species, subspecies, geographical grouping, or other category of fish capable of management as a unit." *Id.* § 1802(42). The National Standard One Guidelines provide additional guidance on the classification of the stocks in an FMP. *See* 50 C.F.R. § 600.310(d)(1) ("Magnuson-Stevens Act section 303(a)(2) requires that an FMP contain, among other things, a description of the species of fish involved in the fishery. The relevant Council [in the first instance] determines which specific target stocks and/or non-target stocks to include in a fishery consistent with the Act's requirements. *See Flaherty v. Bryson*, 2012 WL 752323, *14. The regulations define "target stocks" as "stocks that fishers seek to catch for sale or personal use, including 'economic discards' as defined under Magnuson-Stevens Act section 3(9)," and "non-target species" and "non-target stocks" as "fish caught incidentally during the pursuit of target stocks in a fishery, including 'regulatory discards' as defined under the Magnuson-Stevens Act section 3(38). They may or may not be retained for sale or personal use. Non-target species may be included in a fishery and, if so, they should be identified at the stock level." *Id.* § 600.310(d)(2)-(4).
[52] *See* 50 C.F.R. § 600.310 (d)(7) ("If a stock is identified in more than one fishery, Councils should choose which FMP will be the primary FMP in which management objectives, SDC, the stock's overall ACL and other reference points for the stock are established.")

Thus, binding precedent makes clear that stocks in need of conservation and management must be added to an FMP. A decision by this Council to wait for a specific remedy order in the *Flaherty v. Bryson* case or to ignore the law outlined in that opinion when making management decisions about River Herring would ignore critical information on how to determine the composition of this fishery for management and violate the law.

River herring and shad are involved in the Atlantic herring fishery and capable of being managed as part of it. *See* Amendment 5 DEIS at p. 134; see also p. 447 (Coincidence of River Herring and Shad; *see also Flaherty,* 2012 WL at * 12 ("Defendants' conclusory statement that river herring would simply have to wait until a future amendment does not suffice.") The incidental catch of river herring and shad by all ocean-intercept fisheries (including the herring fishery) averaged an estimated 459 metric tons of river herring per year and an estimated 63 metric tons of shad per year.[53] By contrast, landings of river herring and shad, provided by the ASMFC for fisheries in state waters during the same time period, averaged 601 and 581 metric tons respectively.[54] Further, it is estimated that the mid-water trawl fishery for both Atlantic herring and Atlantic mackerel accounts for 71% of the combined incidental catch of river herring and shads. NMFS observer records show that at-sea fishing vessels may take as much as 20,000 pounds of blueback herring in a single net haul.[55] River herring and shad are caught, kept, landed and sold in this fishery, as well as discarded as bycatch.[56] Thus, it is indisputable that these species are involved in the Atlantic herring fishery and can be managed as part of it.

River herring and shad are in dire need of conservation and management. In addition to the science identified in the DEIS for Amendment 5 (and the DEIS for Amendment 14),[57] the new benchmark stock assessment for river herring, approved for management use by the ASMFC on May 1, 2012, confirms that river herring along the entire Atlantic seaboard are depleted, with many of the river runs barely persisting and near historic lows.[58] Of 24 river stocks that the stock assessment team was able to characterize regarding current condition, 92% were described as depleted.[59] There were "severe declines in [fishery] landings" which "began coastwide in the early 1970s and domestic landings are now a fraction of what they were at their peak having remained at persistently low levels since the mid-1990s."[60] U.S. commercial landings are down 93% from the 1970's.[61] The peer review panel similarly observed that "[s]tocks of river herring are greatly depleted compared to the early 17th century baseline, as well as compared to that of

[53] *See* Amendment 14 DEIS at p. 222.
[54] *Id.*
[55] Haul data from North East Fisheries Observer Program, NMFS; Landings data from NOAA's Annual Commercial Landing Statistics, available at: www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html.
[56] *See* Amendment 5 DEIS at pp. 54, 134, 447; *see also* Appendix IIA, VI, VII (Volume II).
[57] *See* Amendment 14 DEIS, § 2.1.9 Addition of RH as "Stocks in the Fishery" in the MSB FMP at pp. 82-89, § 6.2.5 River Herring Stock Status at p. 210, §6.5.6 Description of Candidate Species for Listing Under the ESA, at p. 240.
[58] *See* The ASMFC's River Herring Stock Assessment Report No. 12-02, Volume 1 – Coastwide (May 2012) ("Stock Assessment Report").
[59] Stock Assessment Report - Executive Summary.
[60] Stock Assessment Report - Executive Summary.
[61] Stock Assessment Report - Executive Summary.

the late 19th century."[62] The peer review "concurs with the SASC [stock assessment sub-committee] conclusions that river herring stocks are depleted, that ocean bycatch is an issue, and that recovery will require management on multiple fronts."[63] For the first time, ocean bycatch of river herring was examined in a stock assessment, and it concluded that at-sea fisheries are a significant factor in the decline of the species' populations over the last 50 years.[64]

In addition to the new stock assessment, NMFS recently determined that a listing of river herring (blueback herring and alewife) as "threatened" under the Endangered Species Act may be warranted.[65] Finding that the petition presented "substantial scientific information that the petitioned action may be warranted," NMFS initiated a year-long status review. As described in the petition, existing state and federal regulatory mechanisms are insufficient for river herring.[66] The current federal/state/regional management framework has avoided the coordinated management necessary to conserve and manage these species. Specifically, the regulatory measures drafted by the Atlantic States Marine Fisheries Commission (ASMFC) in Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring, and implemented through state laws, have proven insufficient because this interstate compact agency has confined the reach of its plan to state waters. Moratoriums on directed fisheries for river herring in several states have been in place for years without sufficiently beneficial results.[67] Although the ASMFC is required to coordinate its management measures with NMFS to promote the conservation of stocks throughout their ranges, this authority has not been exercised.

Shads also need conservation and management. As noted above, figures used to develop Amendment 14 indicate that on average 120,000 pounds of shad were caught per year in ocean intercept fisheries including the Atlantic herring fishery from 2006-2010.[68] Of these approximately 600,000 fish, many of them were juveniles.[69] Currently, shads are managed under Amendment 3 to the IFMP for Shad and River Herring and according to the most recent stock assessment their status is "depleted" as well. The assessment states that shad "stocks were at all-time lows and did not appear to be recovering to acceptable levels."[70] The stock assessment also

---

[62] *Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review* (March 2012)("Peer Review Report"), Introduction at p. 8.
[63] *Id.* at p. 8.
[64] *Id.*
[65] In response to a petition filed by the National Resources Defense Council (NRDC), NMFS made a 90 day finding that a listing may be warranted. 76 Fed. Reg. 67652 (Nov. 2, 2011). Listing determinations are made solely on the basis of the best scientific and commercial data available, after a full status review, and taking into account all efforts to protect and manage the species. 16 U.S.C. § 1533(b)(1)(A).
[66] NRDC Petition at 78-79.
[67] Connecticut, Massachusetts, Rhode Island, and North Carolina have prohibited harvest for several years without recovery of species' populations. *See* Species Profile: River Herring States and Jurisdictions Work to Develop Sustainable Fisheries Plans for River Herring Management, p.2 available at: http://www.asmfc.org/shadRiverHerring.htm. Sustainable Fishery Plans have been approved for 5 states (Maine, New Hampshire, North Carolina, South Carolina and New York.
[68] *See* Amendment 14 DEIS, §4.1.B at p. 111.
[69] *Id.*
[70] ASMFC. August 2007. Stock Assessment Report No. 07-01 (Supplement) of the Atlantic States Marine Fisheries Commission: American Shad Stock Assessment for Peer Review, Volume 1.

noted that coast-wide declining trends raised flags that ocean mortality was having a serious impact, and the peer review team listed bycatch monitoring as a high priority for future action.[71] Amendment 3 currently prohibits ocean intercept fishing for shad, however there is little enforcement. No assessments are available for hickory shad but as noted in the Amendment 14 DEIS, "many runs are likely below historical levels for reasons similar to those discussed below for Atlantic shad."[72]

River herring and shad populations remain in a severely depleted state, and ocean catch in federal waters has been firmly identified as an ongoing threat to these fish. While the ASMFC has implemented conservation measures in state waters up and down the coast, it has ultimately not adopted any protections for federal waters, placing the responsibility squarely on the New England Council, as well as NMFS and the Mid-Atlantic Council to conserve and manage these species.

Section 3.4: Management Measures to Address Midwater Trawl Access to Groundfish Closed Areas

The Council should acknowledge the fundamental change in the understanding of the impacts of midwater trawl gear that has occurred in the years since it was approved for use in the year-round Groundfish Closed Areas (GFCA). Even since Amendment 5 (originally known as Amendment 4[73]) was initiated, new information about this gear has emerged that shows that groundfish bycatch problems have increased. In fact, haddock interactions have become so frequent and problematic that the midwater trawl industry demanded and received a five-fold increase in their haddock bycatch allowance in April 2011.[74] Newly available data also demonstrate that far too much of this problem results from fishing by MWT vessels in the GFCAs.[75] Finally, troubling evidence of the extent of seafloor contact by MWT gear has emerged, validating concerns that, contrary to MWT industry claims, their gear is being fished in close proximity to the bottom where rebuilding groundfish populations aggregate.[76] Midwater trawl gear was approved for use in these sensitive groundfish spawning and nursery areas in 1998 based on the assumption that the gear was incapable of catching significant amounts of groundfish. This was based in part on limited at-sea observer data (13 tows, to be precise, with little to none in the actual groundfish closed areas).[77] It is now clear that the assumption that MWTs do not catch groundfish is not correct.

Since approval in 1998, standards for approving access to these areas have changed. Fishermen wishing to conduct operations in these areas today must conduct robust experimental fisheries

---

[71] *See* ASMFC American Shad Stock Assessment Peer Review Panel, Stock Assessment Report No. 07-01 of the ASMFC, Terms of Reference & Advisory Report to the American Shad Stock Assessment Peer Review. July 2007.
[72] Amendment 14 DEIS, s. 6.2.6 at p. 213.
[73] See Am 5 DEIS at page 6
[74] See footnote 6 on page 2 of this letter
[75] See footnote 7 on page 3 of this letter
[76] See footnote 8 on page 3 of this letter
[77] See Framework Adjustment 18 to the Northeast Multispecies FMP at http://www.nefmc.org/nemulti/frame/Groundfish_Framework_18.pdf

with 100% catch sampling by independent observers, and may do so only after applying for and receiving Exempted Fishing Permits (EFP). EFPs outline rigorous requirements for the scientific sampling of the catch, and typically include very stringent EFP-specific caps on target catch and on bycatch species. Successful experimental fisheries must analyze and submit data and report on results to NMFS and the Council, including a rigorous review process before results can be used for management purposes.[78] Finally, fishermen must successfully secure management measures through a change to an FMP in order to create new fishing opportunities in the GFCA based on the experimental results.

Therefore the Council should approve the following measures:

- **Section 3.5 Alternative 5** (Closed Areas)

  The Council should rescind access to these sensitive areas immediately for all midwater trawl and paired midwater trawl vessels. Regardless of whether a new, more robust at-sea monitoring program is applied to the entire Category A and B herring fleet through other actions in this amendment, the year-round groundfish closed areas can and should be subject to a higher standard. There is ample precedent for applying such a higher standard to fishing operations in the GFCAs. For instance, there is the previously mentioned EFP process for securing the opportunity to fish in these areas. There is also the current set of special rules created for herring vessels in Groundfish Closed Area I (CAI) which require midwater trawlers to have 100% observer coverage and to adhere to special rules that limit dumping of un-sampled catch.

  Closing these areas would encourage herring fishermen to design, apply for, and implement responsible and well-regulated experimental fisheries to determine if, where, when and how any future midwater trawling in these areas should occur. This option would ensure that a public process takes place prior to the issuance of any potential EFPs, such that the public and other affected fishery stakeholders (i.e. groundfishermen) have the opportunity to provide critical input on EFP conditions and experimental design. There are a number of highly-appropriate monitoring measures which are beyond the scope of this amendment or fishery-wide adoption at this time, but which are perfectly appropriate for vessels applying for access to these areas. These include deployment of more than one observer on each vessel to ensure more effective and complete catch sampling, use of electronic monitoring measures especially bottom contact or footrope height sensors, use of video cameras at key locations where fish might be discarded but where observers do not have clear lines of sight, and at-sea catch weighing. In addition, any EFP allowing access to these areas for midwater trawl vessels can and should impose stringent EFP-specific caps on catch and bycatch, or other effort-based controls (such as limits on fishing near or on the seafloor) to control and limit negative impacts on groundfish from the experimental fishery.

[78] See NEFMC Research Steering Committee Research Review Policy at http://www.nefmc.org/research/RSC%20ResearchReviewPolicy%20(2).pdf

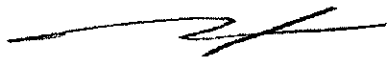
Consolidation of Management:

Overlap between the Atlantic mackerel fishery and the Atlantic herring fishery is well-documented.[79] Improved monitoring and data collection will provide both Councils (as well as the ASFMC) with a more complete picture regarding the overlap of the Atlantic mackerel and Atlantic herring fisheries and their interactions with river herring and shads; however, in order to improve management of all stocks it will be imperative for one FMP to ultimately manage the stocks. We urge the Council to begin discussions with NFMS, the NEFMC, and the ASFMC to create a viable single management plan that will best steward the resources.

Closing comments:

Pew Environment Group strongly supports the NEFMC in its effort to improve the conservation and management of critical forage fish resources involved in this fishery, including both target (Atlantic herring), and non-target (depleted river herring and shads) stocks. Direct and indirect impacts on other marine species caught accidentally in the fishery, or affected by a loss of prey caused by herring and river herring removals, should also be better monitored and controlled. For too long, large midwater trawl vessels have operated in this fishery with substandard monitoring and accountability, to the detriment of other fishermen, the public and the ecosystem.

Sincerely,



Peter Baker, Director
Northeast Fisheries Program
Pew Environment Group

[79] See New England Fishery Management Council Herring Committee and Advisory Panel memo, July 22, 2008, regarding "Background Information re. Herring/Mackerel Fishery Interactions"

and 315, specifically asking the applicants to certify that the proposed assignment or transfer complies with the nnjust enrichment provisions of the Commission's competitive bidding rules. The instructions for FCC Form 316 have been revised to assist applicants with completing the new questions.

Federal Communications Commission.

Gloria Miles,

Federal Register Liaison.

[FR Doc. 2010–29671 Filed 11–29–10; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 100813358–0560–02]

RIN 0648–BA16

Fisheries of the Northeastern United States; Discard Provision for Herring Midwater Trawl Vessels Fishing in Groundfish Closed Area I

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: Through this action, NMFS removes a regulatory exemption for midwater trawl herring vessels, which was originally implemented by a November 2, 2009, final rule. The exemption allowed midwater trawl vessels with an All Areas and/or Areas 2 and 3 Atlantic herring limited access permit fishing in Northeast (NE) multispecies Closed Area I (CA I) to release fish that cannot be pumped from the net at the end of pnmping operations, without those fish being sampled by a NMFS at-sea observer. As a result of this rule, vessels will be required to bring the fish on board the vessel aud make them available to the at-sea observer for sampliug. The publication of this action is part of a Court-approved joint motion to stay pendiug litigation.

DATES: Effective January 31, 2011.

FOR FURTHER INFORMATION CONTACT: Douglas Potts, Fishery Policy Aualyst, (978) 281–9341, fax (978) 281–9135.

SUPPLEMENTARY INFORMATION:

Background

On September 4, 2009, NMFS published a proposed rule (74 FR 45798) to implemeut changes to access requirements for midwater trawl vessels fishing in CA I, at the request of the New England Fishery Management Council (Council), with the intended goal of collecting better information on bycatch in the midwater trawl fishery. A final rule was pnblished on November 2, 2009 (74 FR 56562), that implemented regulations requiring 100-percent observer coverage of trips by vessels with limited access Atlantic herring All Areas and/or Areas 2 and 3 category permits fishing for herring in CA I with midwater trawl gear. The rule also prohibited these vessels from releasing fish from the codend of the net, transferring fish to another vessel that is not carrying an observer, or otherwise discarding fish at sea, nnless the fish has first been brought on board the vessel and made available for sampling and inspection by the observer. The regulations implemented by the November 2, 2009, rule (74 FR 56562) provided the following exemptions to this prohibition:

- The vessel operator has determined there is a compelling safety reason; or
- A mechanical failure precludes bringing the fish aboard the vessel for inspection; or,
- After pumping of fish onto the vessel has begun, the vessel operator determines that pumping becomes impossible as a result of spiny dogfish clogging the pump intake. Under this scenario, the vessel operator must take reasonable measures (such as strapping and splitting the net) to remove all fish that can be pumped from the net prior to release; or
- When there are small amounts of fish that cannot be pumped and remain in the net at the completion of pumping operations.

Additionally, under these regnlations, if a codend is released in accordance with one of the first three exemptious, the vessel operator must complete and sign an affidavit to NOAA's Office of Law Enforcement (OLE) stating the vessel name and permit number; the vessel trip report (VTR) serial number; where, when, and for what reason the catch was released; the total weight of fish caught on that tow; and the weight of fish released (if less than the full tow). Completed affidavits are to be submitted to OLE at the conclusion of the trip. Following a released codend under oue of the first three exemptious, the vessel may uot fish in CA I for the remainder of the trip.

The exception allowing small amounts of fish that cannot be pumped from the net (sometimes called operatioual discards) to be released unobserved from the net while still in the water was not specifically mentioned in the proposed rule. NMFS considered this exemption to be a logical outgrowth of the proposed rule that needed no further public comment becanse it addressed a foreseeable practical problem that a small amount of fish may be left in a net after pumping operations were completed.

However, following publication of the final rule three fishermen filed a lawsuit challenging the exemption allowing the release of small amounts of fish that remain after pnmping (*Taylor et al.* v. *Locke*, 09–CV–02289–HHK). Plaintiffs alleged that this additional exemption violated the Administrative Procednre Act becanse it was not a "logical outgrowth" of the proposed rule and shonld have been subjected to puhlic comment, and that it violated conservation requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) by allowing fish to be released from herring nets unobserved. Plaintiffs also claimed that the terms "small amounts of fish" and "at the completion of pumping operations" were not adequately defined.

Without admitting any violation of applicable law in publishing the original final rule, NMFS and the plaintiffs agreed to stay the litigation while NMFS repromulgated the challenged provision, to solicit public comment. On September 7, 2010, NMFS published a proposed rule (75 FR 54292), that repromulgated the challenged provision (§ 648.80(d)(7)(ii)(D)) and solicited public comment on whether to retain, delete, or amend the additional exemption in question. The proposed rule sought comment on: Retaining the exemption as it currently exists (status quo); eliminating the exemption (Alternative 1); modifying the exemption by specifying a maximum of 200 lb (90.7 kg) of fish that could be released (Alternative 2); or modifying the exemption by requiring that the codend either be brought on board or lifted out of the water, at the captain's discretiou, so the observer could better estimate the amount and type of fish being released (Alternative 3). Public commeuts were accepted through October 7, 2010. Comments received are summarized aud responded to below.

Based ou pnblic comment received, NMFS is implementiug "Alternative 1," and is removing the exemption for operatioual discards at § 648.80(d)(7)(ii)(D). Therefore, if fish remain iu the uet at the conclusiou of pumping operatious, those fish will have to be brought ou board the vessel and made available for sampliug and

inspection by the observer, unless one of the other three exemptions applies. Therefore, fish that have not been pumped on board the vessel may be released if the vessel operator finds that: Pumping the catch conld compromise the safety of the vessel; mechanical failure precludes bringing some or all of a catch on board the vessel; or spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch. If a net is released for any of these three reasons, the vessel operator must complete and sign a CA I Midwater Trawl Released Codend Affidavit stating where, when, and why the net was released, as well as a good-faith estimate of both the total weight of fish caught on that tow and the weight of fish released (if the tow had been partially pumped). The completed affidavit form must be submitted to NMFS within 48 hr of the completion of the trip.

Following the release of a net for one of the three exemptions, the vessel is required to exit CA I. The vessel may continue to fish, but may not fish in CA I for the remainder of the trip.

Comments and Responses

A total of 5,924 comments were received during the comment period for the proposed rule from: 2 representatives of the commercial herring midwater trawl industry; 2 coalitions of herring advocacy groups; 5 representatives of recreational fishing organizations; 4 commercial groundfish organizations; 2 state elected officials (MA State Senator Robert A. O'Leary and MA State Representative Sarah K. Peake); 1 U.S. Congressman (Representative William Delahunt, MA); 6 environmental organizations; 1 community organization; 2 agriculture and fishery advocacy groups; the Atlantic States Marine Fisheries Commission (ASMFC); and 5,898 individuals. One comment was received after the close of the comment period. The vast majority of comments were form letters submitted by enviroumental organizations. The two representatives from the commercial herring midwater trawl indnstry snpported the status quo. All other comments received supported Alternative 1 in the proposed rule. Alternatives 2 or 3 were not supported by any commenters and were criticized as being impractical or ineffective.

Comment 1: The two representatives of the commercial midwater trawl herring industry supported the status qno measure and raised concerns about each of the proposed alternatives. To illustrate their concerns, they described current procedures and how these procedures are not compatible with the proposed alternatives. The commenters noted that, nnder current operations, a vessel typically brings the full net alongside the vessel, where the end of the net is hoisted aboard in order to attach the pump. The pump and net are then lowered back into the water and splitting lines and straps are used to move catch to the pump. When the pump is moving mostly water, with an occasional fish, pumping is stopped, and the pump is removed from the net, leaving the codend open and releasing any fish that are still in the net. The empty net is then brought aboard in order to reset clips and rings before being set out for the next tow. The commenters assert that it could be dangerous for a vessel to attempt to re-cinch the end of the net after pnmping is concluded in order to then bring the net aboard with the remaining catch.

Response: NMFS acknowledges that some vessels may need to adjust their fishing practices in order to remove the fish pump from the net without releasing the remaining fish, so that the fish in the net can be brought aboard for the observer to sample. The time between publication of this rule and when it becomes effective can be nsed by these vessels to develop alternative methods that allow safe operation within these requirements. A vessel may continue to fish outside of CA I while new procedures are developed. NMFS believes the safety and other exemptions sufficiently address commenters' concerns regarding the practical and safety operational difficulties of bringing nets on board vessels after pnmping operations while creating a disincentive to invoke the exemption without justification. For any safety problems in bringing the net on board for inspection after pumping operations are complete, the vessel operator may take advantage of the exemption allowing release of fish for vessel safety. However, the vessel would still need to abide by the requirements of this exemption, including leaving CA I for the remainder of that trip.

Comment 2: The two representatives of the commercial midwater trawl herring indnstry asserted that it is impossible for these vessels to safely bring full nets and brailers over the side or over the stern of the vessel. In contrast, several other commenters cited remarks from a member of the commercial herring midwater trawl industry at the Jnly 15, 2010, meeting of the Council's Atlantic Herring Plan Development Team, that a midwater trawl vessel could not bring aboard a full net, but could bring aboard up to 1 ton (907.1 kg) of fish in the net. A commenter who claimed experience on both midwater trawl and purse seine herring vessels also asserted that up to 1 ton (907.1 kg) of fish could safely be brought on board a midwater trawl vessel.

Response: This action does not require full nets and brailers to be brought aboard a vessel. The intent of the subject exemption was the release of very small amounts of fish, perhaps a few hundred pounds per tow, which physically could not be pumped. It was not intended to cover the release of larger amounts of fish. Three other exemptions, for safety, mechanical failure, or spiny dogfish clogging the pump allow release of larger catches that cannot be pumped aboard.

Comment 3: The representatives of the commercial midwater trawl herring indnstry stated that the proposed alternatives are unnecessary becanse at-sea observers are currently provided nearly every opportnnity to estimate the volume, and most often the species of fish, remaining in the net before it is released. Conversely, on this snbject several individuals, commercial groundfish organizations, and coalitions of herring advocacy gronps opposed observer sampling protocols that rely on such "visual access" to the codend to estimate catch that is released. These commenters supported Alternative 1 as the only way to accurately account for all catch by the midwater trawl vessels operating in CA I.

Response: When determining the volume of fish before release, the at-sea observer must often rely on the estimations provided by the vessel operator and crew who are much more familiar with the specific gear in use. Species ideutification of fish remaining in the net is not typically possible. Observers may be able to identify large-bodied organisms in the net, but are nnable to reliably differentiate many fish to their species. Even if fish at the surface of the net are identifiable, the contents may not be homogeneous and the observer cannot determine the full composition of the net. Therefore, released catch is typically classified as "Fish, NK" (i.e., fish, species not known). The Conncil's request for increased observer coverage in CA I was intended in part to provide additional information on the total catch of this fishery that could then inform future management actions. In order to provide the most complete and valuable information for this purpose, it is important to record, as completely and accurately as possible, the catch of vessels subject to this increased observer coverage. The removal of this exemption may help to address continued questions regarding

stratification of catch within a net or whether the pump housing, which is primarily designed to keep the net out of the pump, might also exclude some larger hodied species.

Comment 4: The ASMFC supported Alternative 1, but suggested NMFS periodically review this measure to determine if the level of data collection continnes to be necessary and if the burden to the industry is jnstified.

Response: This rule may be re-considered and even superseded by a futnre Council action modifying the catch monitoring program for the Atlantic herring fishery as a whole. If the Council does not choose to review and reevaluate the reqnirements for access to CA I, the regulations would still be snbject to the normal periodic review process and could be changed to account for new information about the burden on the fishery if necessary or appropriate.

Comment 5: No commenter supported either Alternative 2 or Alternative 3. Representatives of the commercial herring midwater trawl industry, representatives of commercial groundfish industry, and environmental groups all criticized these proposed alternatives as being unworkable.

Response: As explained in the proposed rule, these alternatives were intended as examples of possible modification to the existing regulation. The limit on how much can be released in Alternative 2 would be difficult to estimate, and could pnt the observer in an enforcement role. Alternative 3 would require the vessel crew to re-cinch the net after pumping, which is one of the major hurdles to bringing the catch on board. In addition, raising the net out of the water does not address the question of catch composition within the net and may pose even more logistical problems than bringing the net and catch on board. Therefore, NMFS did not consider either of these as acceptable alternatives for this fiual rule.

Comment 6: Some commenters objected to the Council granting midwater trawl vessels access to CA I for various reasons, including that midwater trawl access to groundfish closed areas was authorized based on less research and analysis than was required for the establishmeut of the NE Multispecies CA I Hook Gear Haddock Special Access Program (SAP). These comments included opposition to all midwater trawling, requests that the 100 percent observer coverage requirements apply to all groundfish closed areas, questions on the use and enforcement of the Closed Area I Midwater Trawl Released Codend Affidavit, and objections to the Council's requirement that in order to access CA I vessels targeting groundfish through the NE Multispecies CA I, Hook Gear Haddock Special Access Program had to meet a higher hurdle in terms of documenting bycatch than did midwater trawl vessels.

Response: These comments question the underlying provision of allowing midwater trawl vessels access to CA I, and other attendant reqnirements, which is beyond the scope of this rule, and, therefore not addressed in this final rule.

Classification

Pursuant to section 304(b)(1)(A) of the Magnnson-Stevens Act, the NMFS Assistant Administrator has determined that this final rule is consistent with the Atlantic Herring and NE Multispecies FMPs, other provisions of the Magnnson-Stevens Act, and other applicable law.

This final rule has been determined to be not significant for purposes of Execntive Order 12866.

The Chief Connsel for Regnlation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Bnsiness Administration during the proposed rule stage that this action wonld not have a significant economic impact on a substantial number of small entities. The factual hasis for the certification was published in the proposed rule and is not repeated here. NMFS received no comments questioning or regarding this certification.

Dated: November 24, 2010.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

■ For the reasons set out in the preamble, 50 CFR part 648 is amended as follows:

PART 648—FISHERIES OF THE NORTHEASTERN UNITED STATES

■ 1. The authority citation for part 648 continues to read as follows:

Autbority: 16 U.S.C. 1801 *et seq.*

§ 648.80 [Amended]

■ 2. In § 648.80, remove paragraph (d)(7)(ii)(D).

[FR Doc. 2010–30152 Filed 11–29–10; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 679

[Docket No. 0910131362–0087–02]

RIN 0648–XA066

Fisheries of the Exclusive Economic Zone Off Alaska; Big Skate in the Central Regulatory Area of the Gulf of Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Temporary rule; closure.

SUMMARY: NMFS is prohibiting retention of big skate in the Central Regulatory Area of the Gulf of Alaska (GOA). This action is necessary because the 2010 total allowable catch (TAC) of big skate in the Central Regnlatory Area of the GOA has been reached.

DATES: Effective 1200 hrs, Alaska local time (A.l.t.), November 24, 2010, through 2400 hrs, A.l.t., December 31, 2010.

FOR FURTHER INFORMATION CONTACT: Josh Keaton, 907–586–7228.

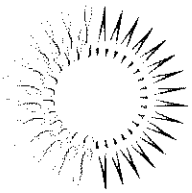
SUPPLEMENTARY INFORMATION: NMFS manages the gronndfish fishery in the GOA exclusive economic zone according to the Fishery Management Plan for Gronndfish of the Gulf of Alaska (FMP) prepared by the North Pacific Fishery Management Council under authority of the Magnuson-Stevens Fishery Conservation and Management Act. Regnlations governing fishing by U.S. vessels in accordance with the FMP appear at subpart H of 50 CFR part 600 and 50 CFR part 679.

The 2010 TAC of big skate in the Central Regulatory Area of the GOA is 2,049 metric tons (mt) as established by the final 2010 and 2011 harvest specifications for groundfish of the GOA (75 FR 11749, March 12, 2010).

In accordance with § 679.20(d)(2), the Administrator, Alaska Region, NMFS (Regional Administrator), has determined that the 2010 TAC of big skate in the Central Regulatory Area of the GOA has been reached. Therefore, NMFS is requiring that big skate caught in the Central Regulatory Area of the GOA be treated as prohibited species iu accordance with § 679.21(b).

Classification

This action responds to the best available information recently obtaiued from the fishery. The Assistant Administrator for Fisheries, NOAA



THE PEW ENVIRONMENT GROUP

June 4, 2012

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

RE: AMENDMENT 14

Dear Dr. Moore,

On behalf of the Pew Environment Group I am writing in response to the Mid-Atlantic Fishery Management Council's (MAFMC or Council) request for public comments on the Amendment 14 (AM 14) Draft Environment Impact Statement (DEIS) to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP). For a full list of our preferred alternatives, please see Table 1 provided at the end of these comments.

Providing adequate conservation and management for river herrings and shad in federal waters requires that catch of these species be effectively monitored, reduced and limited, therefore the Council must select the following alternatives from the AM 14 DEIS:

- Add river herring and shads as non-target stocks in the MSB FMP. **(Alternatives 9b-e)**
- Implement immediate interim measures to reduce and limit incidental catch of river herring and shads until the full suite of conservation and management measures to integrate them as non-target stocks is developed and implemented as required.
    - Implement mortality caps for river herring and shads (alosines) in the mackerel fishery. Modify the proposed caps to reduce the incidental mackerel catch allowable to 2,000 pounds per trip once the cap is exceeded and directed fishing for mackerel stops. **(Modified Alternatives 6b and 6c, and Alternative 6f)**
    - Close river herring hotspots to directed squid and mackerel fishing. Close the "River Herring Protection Areas" identified by the NEFMC in Am 5 to the Herring Plan **(Modified Alternative 8eMack and Alternative 8eLong)** and also create a mechanism under which the larger "River Herring Monitoring/Avoidance Areas" identified in Am 5 could be closed through a future Framework Adjustment. **(Modified Alternative 8b)**
- Improve vessel reporting and catch monitoring program for all MSB permits, including 100% observer coverage for midwater trawl vessels in the mackerel fishery, and 50% coverage in the squid fishery, in order to improve precision and accuracy in incidental catch estimates. **(Modified Alternatives 5b4, 5c and 5d, Alternative 5f, Modified Alternative 5h, and Alternatives 1c, Modified 1d48, 1eMack & 1eLong, 1f Mack, Modified 1gMack & 1gLong; Modified Alternatives 2b, 2c, 2d, 2e, 2f; 3b, 3c, 3d, Modified 3j, 3l, 3n, 3o)**
- Include flexible management options, either through the specifications process or through a framework option, to easily adapt management in the future.

River Herring and Shad Must Be Included as Stocks in the Fishery:

The only alternatives available to the Council that will ensure the long-term protection and recovery of river herring and shads are the inclusion of these species as non-target stocks in the Mackerel, Squid and Butterfish FMP (Alternative Set 9b-e). Stocks in the fishery will most effectively allow the MAFMC to control mortality in its jurisdiction. Furthermore, because shads and river herring are involved in this fishery and in need of conservation and management, their addition as stocks in the MSB FMP is required as a matter of law.[1] Under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the National Marine Fisheries Service (NMFS) is required, through the regional councils, to prepare an FMP or amendments for ***all*** fish stocks that are in need of conservation and management.[2] This requirement was recently affirmed in *Flaherty v. Bryson*, which reiterated the MSA's directive that, under Section 302 of the MSA, Councils must prepare an FMP or amendment for any stock of fish that "requires conservation and management."[3] The Council must then set ACL, AMs and other conservation and management measures for all of the stocks in the fishery.[4]

However, since Alternative Set 9b-e states that fully integrating river herring and shads to the MSB FMP as stocks in the fishery will require a further amendment, the Council must also use additional alternatives within Amendment 14 as interim measures to reduce and limit the unregulated incidental catch of river herring and shads discussed below, beginning on page 6.

The MAFMC must include river herring and shads within the MSB FMP as non-target stocks, as required by the MSA and outlined by the revised National Standard 1 (NS1) Guidelines.[5] The MSA requires management of fish stocks that are in need of conservation and management.[6] River herring and shads, as outlined in the following section, are in desperate need of conservation and management at the federal level. This management can take place directly through federal FMPs created by regional councils and implemented by NMFS, through a Secretarial FMP created and implemented by NMFS alone, or through NMFS implementation of regulations consistent with an Interstate Fishery Management Plan (IFMP) and the MSA's National Standards.[7]

---

[1] *See Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 8, 2012) .

[2] 16 U.S.C. § 1852(h)(1); § 1854(c)(1); 16 U.S.C. § 5103(b)(1). (Emphasis added). *See also* Flaherty, 2012 WL at *13.

[3] 2012 WL 752323, *13, 14 (D.D.C. Mar. 8, 2012) ("[16 U.S.C. § 1852(h)(1)] requires FMPs and necessary amendments for all 'stocks of fish which can be treated as a unit for purposes of conservation and management' and which are in need of conservation and management. *Id.* §§ 1802(13)(a), 1852(h)(1).").

[4] *See Flaherty*, 2012 WL at *9.

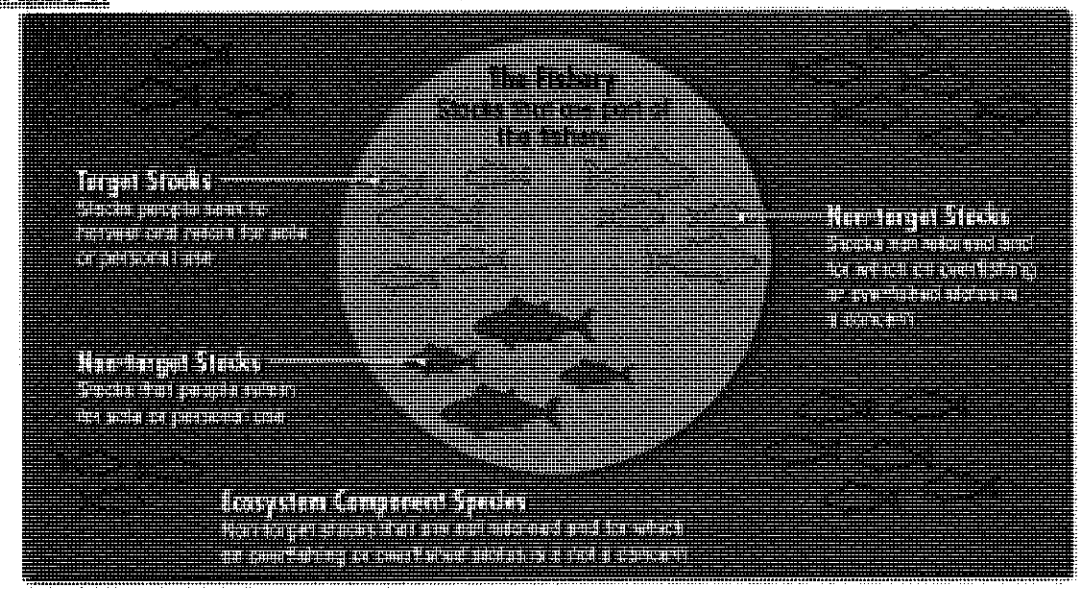
[5] 50 CFR § 600.310(d)(3-4).

[6] 16 U.S.C. §§ 1852(h)(1); § 1854(c)(1); 16 U.S.C. § 5103(b)(1). *See also* Flaherty, 2012 WL at *13.

[7] *Id.* This provision of the Atlantic Coastal Fishery Management Act provides that in the absence of an approved and implemented federal FMP, after consulting the appropriate council(s) NMFS can implement regulation for federal waters that are both compatible with the IFMP and consistent with the national standards. Regulations to implement an approved federal FMP prepared by the appropriate council would supersede any regulation issued by the Secretary.

In the absence of independent action by NMFS, not including river herring and shad in the SMB FMP is in violation of the MSA requirements to conserve and manage marine resources, and is inconsistent with the best practices recommended by the NS1 Guidelines. The MSA requires that federal FMPs describe the fish stocks involved in a fishery.[8] To comply with the MSA's mandate to prevent overfishing, the revised NS1 Guidelines require relevant councils to identify the stocks in the fishery, including the non-targeted stocks that are caught incidentally and retained or discarded at sea. The MSA defines 'non-target stocks' as fish that are "caught incidentally during the pursuit of target stocks in a fishery, including 'regulatory discards' as defined under Magnuson-Stevens Act section 3(38). They may or may not be retained for sale or personal use."[9] Figure 1 (below) outlines the NS1 approach to classifying aspects of the fishery. There is no question the river herring and shads are involved in the SMB fishery and are capable of being managed as part of the FMP.[10] River herring and shads are both caught as incidental catch and in most cases retained for sale,[11] are clearly stocks that are part of the fishery, and as such should be included in the FMP as non-target stocks.

Figure 1:[12]



[8] 16 U.S.C. § 1853(a)(2)

[9] 50 C.F.R. § 600.310(d)(4)

[10] *See* 16 U.S.C. § 1853(a)(2). The Act requires an FMP to contain, among other things, a description of the species of fish involved in the fishery. A "fishery" is defined as "one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics." *Id.* § 1802(13). A "stock of fish" is defined as a "species, subspecies, geographical grouping, or other category of fish capable of management as a unit." *Id.* § 1802(42). National Standard Seven Guidelines provide limited additional guidance stating that the Act requires plans for "fisheries where regulation would serve some useful purpose and where the present or future benefits of regulation would justify the costs." 50 C.F.R. § 600.340(b).

[11] *See* Amendment 14 DEIS, Incidental Catch Analysis, page 569-582.

[12] *Preventing Overfishing*. (n.d.). retrieved from http://www.preventoverfishing.com/aclpo/115.html

In *Flaherty v. Bryson*, the Court made clear that the MSA requires management of populations in need of conservation and management, such as depleted river herring and shad stating, "the MRSA [Revised Magnuson-Stevens Act] requires ACLs and AMs for all stocks in need of conservation and management, not just those stocks which were part of the fishery prior to the passage of the MRSA...The setting of ACLs and AMs necessarily entails a decision as to which stocks require conservation and management."[13] In this case, the Court held that NMFS's rubber stamping of the New England Fishery Management Council's (NEFMC) failure to include river herring as a non-target stock in the Atlantic Herring FMP, without ensuring that it was consistent with the MSA's "conservation and management requirement," was unlawful.[14] Since, as demonstrated previously, river herring and shads are involved in the SMB FMP and in need of conservation and management, they must be added to the MSB FMP. NMFS must review Council decisions to ensure that they comply with these requirements of the MSA, and disapprove those that do not.

In the subsequent FMP amendment, triggered by Alternative set 9, the Council should develop the required annual catch limits (ACLs) and other Status Determination Criteria (SDC) for river herring and shad, and any appropriate measures that would be required to ensure that the limits are not exceeded, or seek alternative methods to satisfy the ACL requirements in consultation with NMFS. In addition, the Council should consider any other measures necessary to reduce bycatch, as required by National Standard 9.

River Herring and Shad are in Need of Conservation and Management in the MSB FMP:

The MAFMC should look to the MSA's definition of "conservation and management" [15] in making its decision to add these species to the FMP. This definition addresses stocks where action is necessary to rebuild, restore, or maintain "any fishery resource and the marine environment," to ensure a constant food supply and recreational benefits, and to avoid irreversible or long-term adverse effects on the fishery resources and the marine environment. National Standard 7 and its guidelines provide some additional criteria that can be looked to for guidance.[16]

River herring and American shad populations are at historic and dramatic lows.[17] Currently river herring and shads are managed by the Atlantic States Marine Fisheries Commission (ASMFC)

---

[13] *See Flaherty,* 2012 WL at *11. *Parenthesis added*

[14] *See Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 8, 2012).

[15] 16 U.S.C. § 1802(5).

[16] *See* 50 C.F.R. 600.340(b). Although the criteria note that adequate management by an entity like the ASMFC could be one factor in determining whether a stock should be added to a fishery, in this case, the ASMFC plan does not address the catch of river herring and shads in federal waters. The Court in *Flaherty v. Bryson* did not address this in the opinion because even NMFS recognized that the ASMFC plan does not address the federal waters.

[17] The ASMFC lists the status of American shad, alewife and blueback herring as depleted in accordance with the most recent stock assessments for these species. American Shad: ASMFC. August 2007. Stock Assessment Report No. 07-01 (Supplement) of the Atlantic States Marine Fisheries Commission: American Shad Stock Assessment for Peer Review, Volume 1. River Herring: ASMFC. May 2012. Stock Assessment Report No. 12-02 of the Atlantic States Marine Fisheries Commission: River Herring Benchmark Stock Assessment, Volume 1. *See also:* Hall CJ (2009) Damming of Maine Watersheds and the Consequences for Coastal Ecosystems with a Focus on the

under Amendments 2 and 3 to the Interstate Fishery Management Plan for Shad and River Herring. This plan, however, only implements conservation and management measures in state waters, and is irrelevant to whether or not river herring and shads are in need of conservation and management measures in *federal* waters. Equally irrelevant to the decision about whether to add these stocks to an FMP is the fact that NMFS has failed to identify them as overfished or that overfishing is not occurring.[18] What is relevant is that the ASMFC's recently released stock assessment for river herring found that alewife and blueback herring along East Coast are "depleted," with many populations in a dangerously diminished state.[19] Their disappearance from traditional fishing grounds in rivers and estuaries is alarming, not only for the communities and fishermen that depend on them, but for the coastal ecosystem as a whole. Restoration of these anadromous species depends on a comprehensive management plan that protects them throughout their lifecycle and migratory range, including while at sea.

Total catch (bycatch and incidental) in federal waters is impeding shad and river herring rebuilding efforts. According to the ASMFC's 2012 stock assessment, at-sea fisheries are a significant factor in the decline of river herring populations over the last 50 years.[20] In some years, more than 2 million pounds of adult and juvenile river herring are killed incidentally by at-sea fisheries, of which the Mid-Atlantic mackerel and squid fisheries contribute to approximately half of the total at-sea catch.[21] Of the roughly 5 million river herring taken at sea every year, many are immature. The majority of the 600,000 American shad taken are also juveniles.[22] High fishing mortality on immature fish has a significant negative effect on stock status and reduces effectiveness of rebuilding efforts,[23] an issue of concern highlighted by the Peer Review Panel in the recent river herring stock assessment.[24] The Peer Review Panel also found that total mortality levels in all runs examined surpassed the recommended mortality benchmark and called for all sources of mortality to be addressed, **including ocean bycatch**.[25] NMFS observer records show that at-sea fishing vessels may take as much as 20,000 pounds of blueback herring in a ***single net haul***.[26] To put this in perspective, consider that the 2008 commercial blueback herring landings from the states of New York, Delaware, and Virginia *combined* totaled just 26,000 pounds. If the fish are aggregated while at sea, a single haul could obliterate an entire river's herring population.

Anadromous River Herring (Alosa pseudoharengus and Alosa aestivalis): A Four Century Analysis. Masters' Thesis, Marine and Atmospheric Science, Stony Brook University; Limburg KE, Waldman JR (2009) Dramatic Declines in North Atlantic Diadromous Fishes. BioScience 59(11): 955-965

[18] *See Flaherty*, 2012 WL at *13.

[19] *See* Atlantic States Marine Fisheries Commission, River Herring Benchmark Stock Assessment Report, Executive Summary.

[20] *See* River Herring Benchmark Stock Assessment, Peer review report, Page 8.

[21] *See* Amendment 14 DEIS, Incidental Catch Analysis, Page 571

[22] *See* Amendment 14 DEIS, p. 111

[23] *See* Vasilakopoulos, P., O'Neill, F. G., and Marshall, C. T. 2011. Misspent youth: does catching immature fish affect fisheries sustainability? – ICES Journal of Marine Science, 68: 1525–1534.

[24] *See* ASMFC. May 2012. Stock Assessment Report No. 12-02 of the Atlantic States Marine Fisheries Commission: River Herring Benchmark Stock Assessment, Volume 1. pp. 15-16.

[25] *Id*, at page 29

[26] Haul data from North East Fisheries Observer Program, NMFS; Landings data from NOAA's Annual Commercial Landing Statistics: www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html

Despite efforts to improve riverine ecosystems and longstanding bans on fishing both in-river and in coastal state waters in a number of states, river herring and shad continue to struggle along the eastern seaboard. In 2012, all but 5 states[27] on the East Coast placed a moratorium on river herring in state waters for both commercial and recreational fishing. Even in the states without a moratorium, fishing for river herring is extremely restricted. In 2013, many states will add new restrictions to the catch of American shad within state waters, or go into moratorium as well. Without a federal management plan that compliments the rebuilding efforts within state waters, river herring and shad fisheries in state waters are unlikely to reopen in the future.

These fish have been an integral part of coastal community life for centuries, and the MSB fishery is adversely affecting these economically, biologically, and culturally important resources. In previous decades, when abundance was substantially higher, these fish also played a key role as forage for a great number of predators including larger, commercially important fish such as Atlantic cod and striped bass – alosines were once a vital link between the sea and coastal estuaries, streams and lakes. These ecological and cultural functions must be restored. Further, because they are forage fish critically important to the diets of dozens of other marine and terrestrial species, these adverse impacts ripple through the ecosystem and coastal economies.

The MAFMC Should Implement an Interim Catch Cap for Alosines in the Mackerel Fishery:

Adding river herring and shad as stocks in the MSB fishery through AM 14 will not constitute sufficient action in and of itself. While the Council develops a trailing amendment to meet criteria required under the MSA for fully integrating river herring and shads as stocks in the MSB FMP, the Council must establish a mortality cap through AM 14 to immediately begin reducing and limiting at-sea mortality of these depleted species. This interim catch cap should be effective in 2013, and remain in effect until replaced by ACLs or similar conservation measures under the MSB FMP once the river herring and shads are fully integrated in the FMP.

The Council should select Alternatives 6b and 6c, to jointly function as a single mortality cap in the mackerel fishery. However, due to the overlap of the mackerel fishery with the herring fishery,[28] these alternatives should be modified to improve consistency between the two FMP's, improve effectiveness of the cap, and ensure that vessels cannot circumvent a cap by simply declaring into another fishery. These alternatives should be modified to more effectively ensure that directed mackerel fishing stops, that mackerel discarding does not continue or increase, and that river herring and shad removals cease if a cap is reached by lowering the incidental trip allowance of mackerel that can be fished for, possessed or retained.

---

[27] Maine, New Hampshire, New York, North and South Carolina submitted Sustainable Fishing Plans under ASMFC regulations and received approval from ASMFC for limited in-river and state waters fisheries.

[28] *See* July 22, 2008 New England Fishery Management Council (NEFMC) Herring Committee and Advisory Panel memo, regarding "Background Information re. Herring/Mackerel Fishery Interactions".

The mackerel fishery should close once it is determined that it created a certain level of alosine mortality (that level would be determined annually by the Council in a specification process, and should be set as a proportion of recent alosine catch history,[29] until better data are available). Such a combined cap (river herring and shads together) would afford better protection to all alosine species and can be refined once the Council attains more precise estimates of incidental catch with increased observer coverage. However, because overlap between the Atlantic herring and Atlantic mackerel fisheries, particularly among large midwater trawl vessels which constitute the majority of the catch, would complicate the implementation of a cap on the mackerel fishery alone, Alternatives 6b and 6c should be modified to lower the incidental trip allowance.

The current mackerel incidental allowance of 20,000 pounds that is proposed under 6b and 6c may not sufficiently deter directed fishing. This alternative set should be modified to be consistent with the Atlantic Herring FMP, which uses a 2,000 pound incidental Atlantic herring limit to define, deter and close directed herring fishing, including for the purposes of enforcing herring ACL's and sub-ACL's.[30] This incidental limit has proven effective in Atlantic herring management[31] and would provide for more consistent regulation of the mixed herring and mackerel fisheries, including for the purposes of a river herring mortality cap. The AM 14 DEIS raises the valid concern that directed Atlantic herring fishing might continue, in some cases by the same vessels, under a closure of the mackerel fishery due to a cap, undermining the effectiveness of the cap. However, a reduced mackerel incidental limit consistent with the Atlantic herring limit would likely deter directed Atlantic herring fishing quite effectively and ensure the integrity of the cap. This is illustrated, via a converse example, by the 2012 Mackerel Advisory Panel Performance Report, which cites industry statements that the directed mackerel fishery in 2012 effectively closed once the directed herring fishery in Management Area 2 was closed via the 2,000 pound limit.[32] If the cap is reached, the directed mackerel fishery should be closed through implementation of an incidental catch allowance of 2,000 pounds, instead of the 20,000 pounds proposed. Further, the implementing language for that incidental limit should be consistent with the language in the Herring FMP such that the 2,000 pound limit would apply to vessels "fishing for, catching, possessing, transferring, or landing more than 2,000 lb."[33]

---

[29] The MAFMC currently sets ABCs/ACLs in the MSB fisheries using past catch history, and this approach would be consistent with best available science on setting catch limits on data poor stocks ; catch limits for Atlantic herring are also based upon recent catch.

[30] The 2,000 pound limit used to close the directed fishery was approved in Amendment 4 to the Herring FMP as the sole proactive Accountability Measure for preventing ACL overages and is described in Amendment 4 at: http://www.nefmc.org/herring/planamen/final_a4/AM%204%20DOCUMENT%20FORMAL%20SUBMISSION_100423.pdf . (see page29).

[31] While there have been numerous sub-ACL overages in the herring fishery that are demonstrative of the inadequacies of the Amendment 4 ACL/AM regime, these have typically been the result of a failure to close the directed fishery by implementing the 2,000 pound limit in a timely fashion, rather than as a result of any failure of the 2,000 pound limit to adequately end directed fishing.

[32] See 2012 Industry Performance Report. Available at: http://www.mafmc.org/meeting_materials/SSC/2012-05/1-Staff_2013_MSB_ABC_Memo.pdf, Page 5-6.

[33] Those regulations state that upon closure of the directed Atlantic Herring fishery, NMFS shall "prohibit herring vessel permit holders from fishing for, catching, possessing, transferring, or landing more than 2,000 lb (907.2 kg) of herring per calendar day in or from the specified management area for the remainder of the closure period." See

Alterative 6f, which adds mortality caps to the list of measures that can be introduced through a framework, should also be selected in order to allow for a catch cap on the squid fisheries. As data improves through better catch monitoring and sampling, the Council may find that caps in the squid fishery (or in the butterfish fishery, should butterfish catch limits increase significantly and a directed fishery is re-instituted) are necessary. Currently the MSB FMP does not list incidental catch caps as frameworkable measures, and this alternative would facilitate implementation of caps or cap adjustments, should new data reveal a more significant alosine catch in any of the MSB target fisheries.

Hot Spot Restrictions:

Pew Environment Group supports the closure to directed mackerel and squid fishing of temporal and spatial protection areas identified as having high rates of river herring or shad bycatch ("hot-spots") as an additional tool that should be deployed to reduce catch of river herring and shad as an interim measure (i.e., until these stocks are fully integrated as stocks in the fishery), in addition to the immediate implementation of a mortality cap. The protection areas identified by the NEFMC Herring Plan Development Team (PDT) are small, and the MAFMC's Fishery Management Action Team (FMAT) analyses indicate that protection of small areas alone may not be adequate to effectively reduce catch, or may result in a fishing effort shift that could increase river herring and shad morality. However, coupled with a mortality cap, and based on the PDT's analysis of the same provisions in Amendment 5,[34] the river herring protection areas will provide a positive conservation benefit until management measures for river herrings and shads are fully integrated into the FMP (as stocks in the fishery). Consequently we also request that the alternatives below be utilized to reduce the total catch of river herring and shad at sea. As more data becomes available through increased monitoring, the Council should have all possible tools available at its disposal. The Council should also provide an option under which the protection areas could be expanded, through a framework action, relative to the specific areas that are protected initially. For example, consideration should be given to affording protection to the larger areas identified as "River Herring Monitoring/Avoidance Areas"[35] in Amendment 5 (NEFMC). Finally, the MAFMC should modify the hotspot alternative for mackerel vessels to close them to directed mackerel fishing using a 2,000 pound incidental limit instead of 20,000 pounds as proposed, again to ensure consistency with the herring FMP and to prevent vessels from circumventing the hotspot requirements. See the preceding section exploring this issue relative to the mortality cap for a detailed rationale for this modification.

We support the selection of the following measures in this section:

- **Modified Alternative 8b:** Make implementing the hotspot requirements of NEFMC's Amendment 5 frameworkable. The MAFMC should provide a mechanism through which

---

most recent herring fishery closure notice dated February 23, 2012 in the Federal Register at http://www.nero.noaa.gov/nero/regs/frdoc/12/12HerAear2ClosureTR.pdf

[34] *See* Draft Amendment 5 to the Fishery Management Plan for Atlantic Herring, Volume II, Appendices.

[35] Also described in Am 14 DEIS (See pages 72-77)

the Council could, through a Framework Adjustment, expand the hotspots to encompass the larger River Herring Monitoring/Avoidance Areas, or adjust hotspot requirements to achieve consistency with the Herring FMP. Due to the overlap in these fisheries, if hotspot closures are implemented in the SMB fishery that differ from any implemented in the Atlantic herring fishery, the conservation benefit of the protection areas could be decreased, for instance if small-mesh gears capable of taking river herring were also permitted in the closed areas simply by declaring into a different fishery (i.e. declaring a different target species). As noted before, it is important that the two FMPs achieve consistency.

- **Modified Alternative 8eMack**: Vessels possessing a federal mackerel permit would not be able to **fish for, catch, possess, retain, transfer, or land**[36] more than an incidental level of fish (**2,000** pounds mackerel) while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel.
- **Alternative 8eLong**: Vessels possessing a federal moratorium longfin squid permit would not be able to **fish for, catch, possess, retain, transfer, or land**[37] more than an incidental level of fish (2,500 pounds longfin squid) while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel.

Again, as noted in our comments above on mortality caps, Alternative 8eMack should be modified to improve consistency between the SMB and Atlantic Herring FMP's by aligning the incidental trip allowances and implementing language. Adjusting this parameter of 8eMack from 20,000 pounds to 2,000 pounds and more closely aligning the regulatory language will ensure that vessels cannot circumvent these measures by declaring into another fishery. The Council should carefully monitor the effectiveness of the hotspot regime for squid vessels to determine if any similar adjustments are warranted.

Improved Monitoring and Data Collection:

In order to achieve the stated goals of Amendment 14, and ensure the effectiveness of the above recommended alternatives, it is imperative that the Council improve vessel reporting and third-party catch monitoring for all MSB permits. The Council should select as their preferred alternatives those which increase the accuracy and timeliness of vessel and dealer reporting, coupled with the management measures that greatly improve the accuracy and precision of third-party (i.e. observer) incidental catch estimates. In order to do so, it is critical that the Council dramatically increase observer coverage and ensure that observers have access to all catch for sampling. As such, we support the alternatives detailed below and outlined in Table 1. These alternatives should be consistent with the NEFMC's Atlantic herring FMP in order to avoid discrepancies in measures between the Council's that would cause significant difficulties in implementation or allow for fishing effort to avoid more robust monitoring in one of the FMP's by selectively declaring into the other.

[36] Proposed revisions to make this measure more consistent with incidental catch allowance regulations in the Atlantic Herring FMP. See footnote 33
[37] Ibid

Furthermore, we oppose the addition of a sunset clause for any increased observer coverage levels that are implemented through AM 14. The alternatives already contemplate a review of the observer requirements by the Council in two years (Alternative 5h). This is a more appropriate approach. The Service has also indicated that it may take time for an expanded observer program to be designed for these fisheries and fully established on the water. It would be unfortunate for a sunset clause to kick in prior to a full observer program, and prior to gaining the necessary data that the coverage was intended to obtain. Additionally, it must be recognized that observation can improve performance (e.g., *observer effect*) and consequently it is risky to assume that information gathered under 100% monitoring can be used to predict what the fishery will do without 100% monitoring; the notion that a few years of 100% monitoring can provide a solid foundation for future management is therefore flawed. We also oppose the issuance of waivers, under which a vessel or trip assigned an observer would be allowed to sail without an observer. A robust at-sea monitoring program on vessels of this size, gear type and fishing power, and which have a known potential for infrequent but destructive bycatch events, must have 100% coverage. One hundred percent coverage must mean just that: 100%. A blanket provision allowing the unlimited issuance of waivers with no backstops or other accountability measures is likely to seriously undermine any 100% coverage requirement or other target coverage level.

At-Sea Observer Coverage Requirements (Alternative Set 5):

The at-sea observer program, which obtains data for both kept and discarded catch, is critical to understanding total catch of river herring and shads, and must be prioritized by the Council. To ensure accurate and statistically reliable accounting of catch, increased observer coverage is necessary.[38] In contrast to at-sea observers, portside sampling only obtains information for the catch that is retained, and therefore misses an important part of the equation. Without maximized retention (which is not considered in Amendment 14) we cannot support portside sampling (Alternative Set 4) for deriving estimates on river herring and shad incidental catch. Taken alone, it would miss at-sea discards and provide insufficient data. Absent maximized retention and the related need for at-sea sampling, portside sampling becomes redundant and inefficient.

The current levels of monitoring and data collection within the Mid-Atlantic's midwater trawl and small-mesh fisheries are inadequate.[39] We support the following measures:

- **Modified Alternative 5b4**: Require 100% of MWT mackerel trips by federal vessels intending to **fish for, catch, possess, retain, transfer, or land** over **2,000** pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to **fish for, catch, possess, retain, transfer, or land** more than **2,000** pounds of mackerel unless they had notified their intent to

[38] *See* http://www.mafmc.org/fmp/current/SMB/River_Herring_Letters.pdf .
[39] *See* June 24th, 2009 MAFMC letter to NMFS, at http://www.mafmc.org/fmp/current/SMB/River_Herring_Letters.pdf

fish for, catch, possess, retain, transfer, or land more than **2,000** pounds of mackerel.[40]

Midwater trawl vessels account for 75.7% of river herring incidental catch and 41.8% of shad incidental catch,[41] and are responsible for the majority of mackerel landings, accounting for 62% of landings in 2010.[42] According to information presented in Amendment 11 to the MSB FMP, there are 15 midwater trawl vessels that are eligible for the mackerel limited access program (13 in Tier 1, and 2 in Tier 2).[43] Given the high volume nature of these vessels, and the fact that significant shad and river herring catch events may be infrequent (but events can be large when they occur), 100% coverage is necessary for an accurate accounting of incidental catch. In addition, midwater trawl vessels are in the top permit tiers of the Atlantic herring limited access fishery, for which the New England Council is considering 100% observer coverage. Given the overlap in the midwater trawl fisheries for Atlantic herring and mackerel, observer coverage levels should be consistent between the FMPs.[44] Furthermore, for essentially the same reasons stated above in our explanation for the need to adjust the mackerel incidental limit downward from 20,000 pounds to 2,000 pounds to better align it with Atlantic Herring FMP language and ensure the integrity of a mortality cap, the same adjustments should be made for this alternative. Absent this modification, it is possible that a significant amount of directed mackerel fishing could take place outside the scope of a 100% observer coverage requirement, if the vessels simply declared an intent to fish in the herring fishery (and if the Herring FMP did not have a similar coverage requirement). Allowing vessels 20,000 pounds of mackerel will not sufficiently deter directed fishing by these large vessels that comprise the most significant component of the herring-mackerel fishery overlap.

- **Modified Alternative 5c:** This alternative should be modified to require 100% of Small Mesh Bottom Trawl (SMBT, i.e. mesh <3.5 in) mackerel trips by Tier 1 and Tier 2 limited access mackerel vessels intending to **fish for, catch, possess, retain, transfer, or land** over **2,000** pounds of mackerel to carry observers. Require 25% of SMBT trips by Tier 3 vessels intending to **fish for, catch, possess, retain, transfer, or land** over **2,000** pounds of mackerel to carry observers. [45]

[40] Proposed revisions to make this measure more consistent with incidental catch allowance regulations in the Atlantic Herring FMP. See footnote 33

[41] *See* Amendment 14, Appendix 2, page 581

[42] *See* Amendment 14, Table 29, page 247

[43] *See* MAFMC. Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP). May 2011, Tables 94-96, pages 447-448.

[44] *See* Amendment 14, Appendix 2, page 574

[45] Proposed revisions to make this measure more consistent with incidental catch allowance regulations in the Atlantic Herring FMP. See footnote 33

Small-mesh bottom trawls are believed to contribute to 23.7% and 25.6% of river herring and shad incidental catch respectively; therefore, it is important to improve observer coverage in this fleet to achieve accuracy and precision in incidental catch estimates. Because industry funding will be necessary to achieve coverage levels above the status quo, it is important to distribute the observer cost burden equitably among fishery participants. For the mackerel limited access program, 10 SMBT vessels are eligible for Tier 1, and 19 are eligible for Tier 2.[46] Neither Tier 1 nor Tier 2 vessels are capped by a percentage of the quota, with no trip limits for Tier 1 vessels. For Tier 3, however, 138 vessels qualify,[47] and this tier is capped at 3% of the annual quota. Additionally, the average length of a Tier 3 vessel is 65 ft, compared to 78 ft for Tier 2 and 110 ft for Tier 1,[48] likely making the observer costs significantly more burdensome for vessels in Tier 3 relative to their daily operating costs. One hundred percent coverage on Tier 1 and Tier 2 SMBT vessels engaging in directed mackerel fishing represents a manageable objective that will cover the majority of the catch by this gear type, without undue burden on small boats or the observer infrastructure.

Consistent with our prior suggestions, the MAFMC should also adjust the mackerel incidental catch limit under this alternative to 2,000 pounds to ensure consistency with the Atlantic Herring FMP and to prevent vessels from circumventing observer requirements.

- **Modified Alternative 5d:** This alternative should be modified to require 50% of SMBT (<3.5 in) longfin squid trips by major longfin squid moratorium permitted vessels intending to retain[49] over 2,500 pounds of longfin squid to carry observers.

Only 3.5% of longfin squid catches by weight have been observed in recent years (2006-2010),[50] contributing to great uncertainty in the shad and river herring incidental catch estimates for this fishery. As described above, small-mesh bottom trawls (SMBT) do contribute significantly to shad and river herring incidental catch, and higher levels of at-sea observer coverage will be needed for the Northeast's SMBT fleet, in order to obtain reasonably accurate and precise estimates of this catch. Coverage must be equitably distributed among vessels according to their activity in the fishery. While there are approximately 400 vessels that hold moratorium permits, an average of only 103 vessels have been major vessels in this fishery in the last 5 years, and these major vessels account for around 95% of the annual landings. [51] Of these vessels, 57 account for 75% of

---

[46] *Id.*

[47] *Id.*

[48] *See* MAFMC Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP). May 2011, Table 82, page 435.

[49] While herring-mackerel fishery overlap and consistency concerns are likely not as acute for squid vessels, if the Council's intent is to ensure observer coverage on a target percentage of directed squid fishing trips, it may want to consider revising this alternative to reflect the previously noted language used in the Atlantic herring FMP to define directed fishing ("fishing for, catching, possessing, transferring, or landing"), and which has been proven effective. See footnote 33

[50] *See* Amendment 14 DEIS, page 147.

[51] *See* April 2012 MAFMC Staff .Memo, AP Informational Document, Table 6.

landings. The Council should identify the approximately 100 most active longfin squid vessels (or outline procedures whereby they would self-identify) in advance of the fishing year so that they are clearly and explicitly assigned to the 50% observer coverage bin for that fishing year. Criteria that could be utilized to sort and assign the fleet in this manner include an analysis of recent catch history to identify whether these vessels vary significantly from year to year and/or whether there is a logical annual landings threshold where the line can be drawn. Alternatively, the Council could identify a reasonable and typical annual threshold for landings that makes it likely they will capture the most active vessels (i.e. those which collectively catch 95% of the longfin squid) and require that vessels wishing to land over that number for the year must declare into the higher observer coverage program .

- **Alternative 5f:** Industry would have to pay for observers that are greater than the existing sea day allocation assigned. NEFSC would accredit the observers.

As detailed above, no waivers should be issued without explicit limits and accountability measures to ensure that waivers do not significantly undermine the target coverage level.

- **Modified Alternative 5h:** Require reevaluation of coverage requirement after 2 years to determine if incidental catch rates justify continued expense of continued high coverage rates.

As stated above, we oppose the addition of a sunset clause for any increased observer coverage levels that are implemented through AM 14, and believe that a review of the observer requirements by the Council in two years is a more appropriate approach. However, the language in this alternative needs to be modified. As written, it is too restrictive and hints at foregone conclusions. A review of observer coverage should not be restricted to whether coverage rates are too high and should be reduced. The review should be a comprehensive analysis of whether coverage levels should be adjusted in general, including whether they need to be increased.

Observer Optimization Measnres (Alternative Set 3):

One of Amendment 14's main goals is to reduce total catch of river herring and American shad in the SMB fisheries. In order to successfully reduce total catch of these species, Amendment 14 must have reliable total catch estimates. Estimates of the amount of catch are dependent upon good estimates of the total overall catch because total catch is used in scaling up from the amounts observed in samples. All of the following measures will aid or enhance more accurate estimates of total catch.

- **Alternative 3b:** Require the following reasonable assistance measures: provision of a safe sampling station; help with measuring decks, codends, and holding bins; help with bycatch collection; and help with basket sample collection by crew on vessels with mackerel limited access and/or longfin squid/butterfish moratorium permits.

- **Alternative 3c:** Require vessel operators to provide observers notice when pumping/haul-back occurs on vessels with mackerel limited access and/or longfin squid moratorium permits.
- **Modified Alternative 3d:** When observers are deployed on trips involving more than one vessel, observers would be required on any vessel taking on fish wherever/whenever possible on vessels with mackerel limited access and/or longfin squid moratorium permits.

The language "wherever/whenever possible" should be removed from this alternative. Should the Council choose 100% monitoring, this language would provide a loophole to such a requirement and frustrate the goal of more accurate observer data. The majority of "Fish NK" (or fish unknown) records are associated with fish that are pumped to the paired trawl vessel not carrying the observer.[52] Between July 2009 and June 2010 over 5.7 million pounds of catch was recorded as Fish NK in the observer database.[53] The Council should be clear and explicit that any pair trawl trip assigned observer coverage will require an observer on each platform, and should prohibit the taking of fish on a vessel without an observer.

- **Modified Alternative 3j:** Apply "Closed Area I" (CA1) requirements to mackerel limited access and longfin squid moratorium permitted vessels. These requirements are currently in force in the Atlantic herring fishery for midwater trawl vessels intending to fish in Groundfish Closed Area 1. This alternative would require that all fish be brought aboard for observer sampling with exceptions made for safety, mechanical failure, or spiny dog fish clogging the pump.

Alternative 3j should also clarify that, consistent with the current CA1 sampling regulations, operational discards must be brought aboard for sampling, may only be dumped under one of the other three allowable exceptions, and therefore if dumped would be subject to the accountability requirements outlined in 31, 3n and 3o. Vessels would be permitted to discard (release) un-sampled catch under those limited exceptions, and those only. Further, consistent with these CA1 rules, and in order to prevent any abuse of those limited exceptions, an accountability framework should be layered over the three exceptions as outlined below (Alternatives 3l, 3n and 3o). NMFS has acknowledged that accurate catch composition records cannot be obtained for dumped catch (including operational discards), that there are safe and operationally-feasible ways to get all catch aboard for sampling (including operational discards), and that issues such as stratification of catch in the cod-end or the strainer-like effect of the pump-intake grate raise serious questions about the composition of operational discards.[54] In addition, and consistent with our prior suggestions, this alternative should be modified such that the mackerel incidental allowance is **2,000** pounds instead of 20,000 pounds, and the

[52] *See* Appendix 5 of the DEIS, page 662.

[53] *See* NEFSC. Standardized Bycatch Reporting Methodology Annual Discard Report 201: Section 2, page 189. http://www.nefsc.noaa.gov/fsb/SBRM/2011/SBRM_Annual_Discard_Rpt_2011_Section2.pdf

[54] *See* Final Rule entitled **Fisheries of the Northeastern United States; Discard Provision for Herring Midwater Trawl Vessels Fishing in Groundfish Closed Area I,** Federal Register November 30, 2010,

implementing language should be revised so that the measures apply to trips "fishing for, catching, possessing, transferring, or landing" the specified amount of the target species.[55]

- **Alternative 3l**: For mackerel limited access permitted vessels, NMFS would track the number of slippage events. Once a cap of 10 slippage events (adjustable via specifications) occur in any given year for notified and observed mackerel trips then subsequent slippage events on any notified and observed mackerel trip would result in trip termination for the rest of that year. The goal is to minimize slippage events.

At-sea dumping of unobserved catch, sometimes referred to as slippage or released catch and including the aforementioned operational discards, is an ongoing problem in the SMB fishery. From 2006-2010, 26% of hauls on observed mackerel trips had some unobserved catch.[56] It is also a problem in the overlapping Atlantic herring fishery, from which an illustrative example of successful dumping accountability measures can be drawn. Prior to the implementation of the CA1 rules discussed on the previous page, nearly 30% of observed hauls in the Atlantic herring fishery included dumped catch that was not sampled, and even this is acknowledged as an underestimate because vessel captains did not provide information on dumped catch on all observed hauls.[57] In contrast, vessels fishing under Closed Area I (CA1) regulations in the Atlantic herring fishery had no observed slippage events recorded in 2010.[58] This reduction in dumping in the herring fishery clearly demonstrates that the CAI rules are effective. It is important to note, however, that the effectiveness of the CAI regulations is due to the accountability measures tied to the dumping exceptions, which requires a vessel to stop fishing and exit CA1 if it releases an un-sampled net. The MAFMC should select final AM 14 measures that replicate the CA1 regulations. Given the three exceptions provided for under Alternative 3j, permitting 10 slippage events before slippage results in trip termination provides a reasonable balance that will deter slippage without being unduly penalizing.

- **Alternative 3n:** For longfin squid moratorium permitted vessels, NMFS would track the number of slippage events. Once a cap of 10 slippage events (adjustable via specifications) occur in any given trimester for notified and observed longfin squid trips then subsequent slippage events on any notified and observed longfin squid trip would result in trip termination for the rest of that trimester. The goal is to maximize sampling of catch on observed trips and to discourage and minimize slippage events.

---

[55] See footnote 33
[56] *See* Amendment 14 DEIS, page 130
[57] *See* Amendment 14 DEIS, Appendix 5, pp. 652-653
[58] *See* Amendment 14 DEIS, Appendix 5, page 658.

This alternative should be implemented in conjunction with Alternative 3j. On observed longfin squid trips, an average of 9% to 14 % of hauls are not seen or sampled by observers.[59] As discussed above, an accountability measure is an important component to the CA1 sampling requirements to ensure compliance, and an allowance of 10 slippage events per trimester before trip termination is implemented is appropriate for deterring slippage.

- **Alternative 3o:** For mackerel and/or longfin squid permitted vessels, if a trip is terminated within 24 hours because of any of the anti-slippage provisions, then the relevant vessel would have to take an observer on its next trip.

This alternative is necessary if observer coverage levels are not high enough to effectively deter vessels from dumping unwanted catch or catch they suspect contains bycatch on the rare occasions they are observed. If there is a high likelihood the next trip will not be observed, vessels may not be sufficiently discouraged from dumping early in a trip by the trip termination requirement.

Vessel Reporting (Alternative Set 1):

Weekly VTR submission and daily VMS reporting would improve data accuracy and facilitate quota tracking (directed landings and/or incidental mortality cap if applicable) and reduce the risk of overages to any potential mortality cap. It is important to note that the Atlantic herring FMP already mandates reporting measures identical to or very similar to each of the alternatives listed below, making these proposed measures necessary to improve consistency between the FMP's.

- **Alternative 1c:** Weekly vessel trip reporting (VTR) for all MSB permits.
- **Modified Alternative 1d48:** Require 48 hour pre-trip notification to NMFS to **fish for, catch, possess, retain, transfer, or land**[60] more than **2,000** pounds of mackerel so as to facilitate observer placement.
- **Alternative 1eMack & 1eLong:** Require VMS for limited access mackerel vessels and for longfin squid/butterfish moratorium vessels.
- **Alternative 1fMack:** Require daily VMS reporting of catch by limited access mackerel vessels so as to facilitate monitoring (directed and/or incidental catch) and cross checking with other data sources.
- **Alternative 1fLong:** Should be made frameworkable in the event that a mortality cap becomes necessary in the squid fishery.

---

[59] *See* Amendment 14, p.130 states that 9% of hauls on observer trips go unobserved. SSC materials from Mary 2012 suggest that slippage has increased from previous estimates under the Butterfish Bycatch Program to 14%. See http://www.mafmc.org/meeting_materials/SSC/2012-05/3-2011-Butterfish-Cap-Report(May%202012).pdf.

[60] Proposed revisions to make this measure more consistent with incidental catch allowance regulations in the Atlantic Herring FMP. See footnote 33

- **Modified Alternative 1gMack & Alternative 1g Long:** Require 6 hour pre-landing notification via VMS to land more than **2,000** pounds of mackerel or more than 2,500 pounds of longfin squid, which could facilitate quota monitoring, enforcement, and/or portside monitoring.

Dealer Reporting (Alternative Set 2):

Standardizing the methods by which dealers weigh all catch and requiring vessels to confirm the amount of fish landed will aid in better overall estimates of catch, in addition to being essential for ensuring that directed quotas are not exceeded. More accurate data on landings will also aid in the monitoring of a mortality cap or in achieving the objective of better catch and bycatch estimates of river herring and shad. As the AM 14 DEIS points out, "accurate monitoring of the target species can be as important as determining the encounter rates of [river herring and shad]" in the determination of river herring and shad catch estimates, due to the use of discard-to-kept ratios or other bycatch/incidental catch extrapolations.[61]

Dealer or vessel self-reporting of unverifiable, unstandardized "hail" weights or visually-based volumetric estimates are inadequate and unacceptable. They present far too much opportunity for deliberate or accidental misreporting, and offer no opportunity for third-party observers, port samplers, or law enforcement personnel to verify that accurate, complete and honest catch weights are being reported.

- **Modified Alternative 2b:** Require federally permitted SMB dealers to obtain vessel representative confirmation of SAFIS transaction records for mackerel landings over **2,000** pounds, Illex landings over 10,000 pounds, and longfin squid landings over 2,500 pounds to catch data errors at first point of entry.
- **Modified Alternative 2c-f:** Require that federally permitted SMB dealers weigh all landings related to mackerel transactions over **2,000** pounds and longfin squid transactions over 2,500 pounds.

Consolidation of Management:

Overlap between the Atlantic mackerel fishery and the Atlantic herring fishery is well-documented.[62] Improved monitoring and data collection will provide both Councils (as well as the ASFMC) with a more complete picture regarding the overlap of the Atlantic mackerel and Atlantic herring fisheries and their interactions with river herring and shads; however, in order to improve management of all stocks it will be imperative for one FMP to ultimately manage the stocks. We urge the Mid-Atlantic Council to begin discussions with NFMS, the NEFMC, and the ASFMC to create a viable, single management plan that will best steward the resources.

---

[61] *See* Amendment 14 DEIS, page 279

[62] *See* New England Fishery Management Council Herring Committee and Advisory Panel memo, July 22, 2008, regarding "Background Information re. Herring/Mackerel Fishery Interactions."

Closing Comments:

Pew Environment Group strongly supports the MAFMC in its effort to develop an amendment to the MSB FMP that will provide the strongest conservation and management measures for depleted river herring and shads, and improve monitoring and accountability of the at-sea fisheries which catch with these species in ocean waters.
Sincerely,



Peter Baker
Director, Northeast Fisheries Program
Pew Environment Group

Table 1:

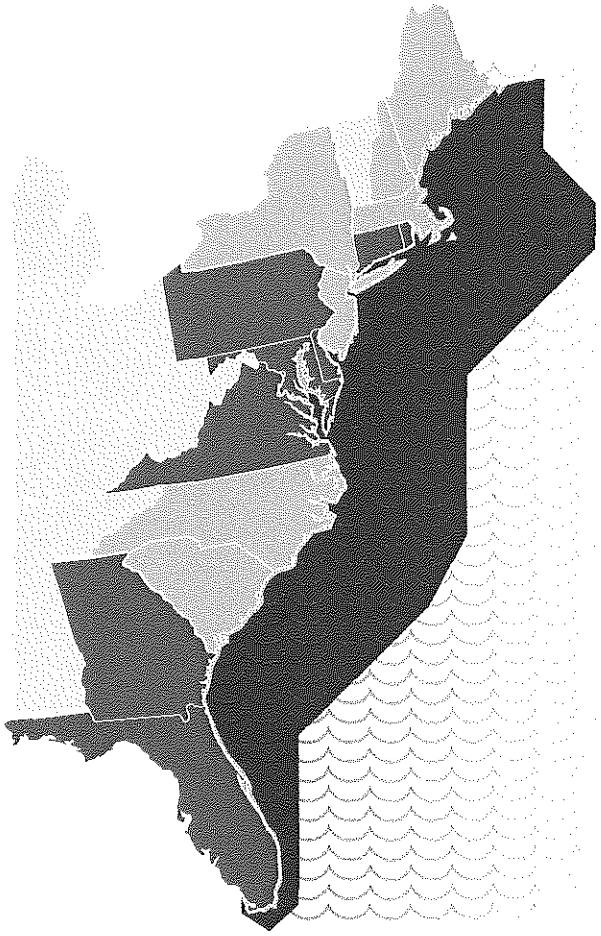
Alternative Set	Preferred Alternative	Description to be applied to the MSB FMP
Set 1: Vessel Reporting Measures	1c	Weekly VTR for all MSB permits
	Modified 1d48	48 hour pre-trip notification to NMFS intent to fish for, catch, possess, retain, transfer or land greater than **2,000 lbs** mackerel
	1eMack & 1eLong	VMS for all Limited Access mackerel vessels and for longfin Squid/Butterfish moratorium vessels
	1fMack	Daily VMS of catch by Limited Access mackerel vessels
	Modified 1gMack & 1gLong	6 hr. pre-landing notification via VMS to land greater than **2,000 lbs** mackerel or 2,500 lbs longfin Squid
Set 2: Dealer Reporting Measures	Modified 2b	Federally-permitted MSB dealers must get vessel confirmation of SAFIS trans records for mackerel landings greater than **2,000 lbs** and longfin Squid greater than 2,500 lbs
	Modified 2c, d, e, & f	Federally-permitted MSB dealers must weigh all landings related to mackerel greater than **2,000 lbs** and 2,500 lbs of longfin squid
Set 3: At-Sea Observation Measures	3b	Reasonable assistance measures
	3c	Vessel operators must provide observers notice when pumping/hauling back
	Modified 3d	When observers are on trips with more than one vessel, observers required on ANY vessel taking on fish. Whenever/wherever possible language should be modified
	Modified 3j	Closed Area 1 Requirements currently in force in Herring FMP apply to vessels fishing for, catching, possessing, retaining, transferring or landing **2,000 lbs** mackerel or 2,500 lbs squid
	3l (implemented w/ 3j)	10 slippage events per year in mackerel fishery
	3n (implemented w/ 3j)	10 slippage events per year in longfin squid fishery
	3o	If a trip is terminated within 24 hours because of any of the anti-slippage provisions then vessel must take an observer on next trip
Set 5: Observer Coverage	Modified 5b4	100% observer coverage of all MWT mackerel trip intending fish for, catch, possess, retain, transfer or land over **2,000 lbs** mackerel. Opposed to a sunset provision and issuance of a waiver
	Modified 5c1 and Modified 5c4	100% observer coverage on Tier 1 and Tier 2 SMBT (<3.5 in.) mackerel trips intending to fish for, catch, possess, retain, transfer or land **2,000 lbs** mackerel; 25% observer coverage of Tier 3 SMBT mackerel trips intending to fish for, catch, possess, retain, transfer or land **2,000 lbs** mackerel

Alternative Set	Preferred Alternative	Description to be applied to the MSB FMP
	Modified 5d2	50% observer coverage of SMBT major vessels in longfin squid trips intending to retain greater than 2,500 lbs longfin squid
	Modified 5f	Vessels contract and pay for observers. Modified to prohibit waivers and require States receive full provider certification in order to be providers
	Modified 5h	2 year review of observer coverage. Review should not be restricted to whether coverage rates are too high
Set 6: Mortality Caps	Combined and Modified 6b and 6c	Mortality cap for shad and river herring species combined for the mackerel fishery. Once cap is reached an incidental mackerel allowance of **2,000 lbs**
	6f	Add mortality caps to list of measures that can be frameworkable
Set 8: Hotspot Restrictions	Modified 8eMack	Vessels cannot fish for, catch, possess, retain, transfer or land **2,000 lbs** mackerel while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel
	8eLong	Vessels cannot fish for, catch, possess, retain, transfer or land 2,500 lbs of longfin squid while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel
	Modified 8b	Inclusion of the AM 5 Herring PDT hotspots, modified to allow for future modifications including expansion into larger "monitoring/avoidance" areas identified by PDT frameworkable
Set 9: Add River Herring and Shads as stocks in the MSB fishery	9b-9e	Add blueback herring, alewife, American shad and hickory shad as SIF under the MSB FMP

A Federal Offense: River Herring Robbery

How are river herring managed on the Atlantic Coast?

River herring are being considered for listing under the Endangered Species Act. While coastal states limit the catch of these important species, no restrictions prohibit commercial fisheries from catching large amounts in federal waters.



Protective Rules

No fishing
These states do not allow recreational or commercial fishing, or the landing of river herring.

Some Rules

Limited fishing
These states allow limited commercial and recreational river herring fishing in state waters, or boats fishing in federal waters can land river herring bycatch (in MA and NJ).

No Rules

Lots of fishing
In federal waters, there are no restrictions on the catch of river herring.



Massachusetts
Striped Bass Association

Since 1950

June 4, 2012

Mr. Paul Howard, Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, Massachusetts 01950

RE: Amendment 5 to the Atlantic Herring Fishery Management Plan

Dear Mr. Howard:

The MSBA has been recognized in many venues as speaking for the New England recreational fishing community on the issue of reforming the industrial Atlantic Herring fishery. The following comments are based upon years of communicating with individual anglers, groups of anglers at various events and finally interaction with other recreational fishing organizations including but not limited to the following:

Honest By Catch, The Buzzards Bay Anglers Club, The MA Beach Buggy Assn, The Martha's Vineyard Surfcasters, The MV Striped Bass & Bluefish Derby, The MA Striped Bass Assn, The New Inlet Boating Assn, The Pioneer Valley Boat & Surf Club, The Plum Island Surfcasters, The Recreational Fishing Alliance (New England Chapter), www.striped-bass.com

We are concerned that the Atlantic Herring fishery is having a detrimental effect on recreational fishing in New England. Collectively, the recreational fishing community wants to regulations adopted that bring strict monitoring and accountability to the industrial scale operators within the Atlantic Herring fishery. Our community believes that this can be achieved if the NEFMC were to adopt the following set of alternatives:

- We support adoption of section 3.2.1.2 alternative 2 (100 percent at-sea monitoring on permit category A & B)

- We support adoption of section 3.2.3.4 option 4D (regulations to discourage the slippage, or dumping, of catch, including a fleet wide limit of five slippage events for each herring management area, after which any slippage event would require a return to port).

- ***We are strongly opposed to any measures that exempt "regulatory discards" from any regulation. All marine life in the codend must be monitored and accounted for in the new regulations.***

- We support adoption of section 3.4.4 alternative 5 (prohibit mid water trawl vessels participating in the Atlantic Herring fishery from access to ground fish closed areas)

- We support adoption of section 3.3.5 (if modified to require immediate implementation of a catch cap on the total amount of river herring caught in the Atlantic herring fishery)

- We support adoption of section 3.3.3.2.1 option 1 (exclusion of category A & B vessels from areas where interactions with river herring have been demonstrated to be high)

- We support adoption of section 3.1.5 option 2a (requirement to accurately weigh and report all catch)

We thank both NEFMC members & staff for considering our comments.

Sincerely

Capt. Patrick Paquette
MSBA Gov;t Affairs

Penobscot EAST Resource Center

PO Box 27
13 Atlantic Avenue
Stonington, ME 04681
(207) 367-2708
www.penobscoteast.org

Securing a future for fishing communities

Board of Directors
Dennis Damon, Chair
Walter Reed, Vice-Chair
Chuck Lucas, Treasurer
Charlie Osborn, Secretary

Ted Ames
Dwight Carver
Rebecca Emerson
Anne Hayden
Ted Hoskins
Jennifer Larrabee
Paul Lewis
Robert Steneck
Paul Venno
James Wilson

Executive Director
Robin Alden

Development Director
Odette Galli

Downeast Groundfish Initiative Director
Aaron Dority

Fisheries Policy Associate
Patrick Shepard

Fisheries Science and Leadership Advisor
Carla Guenther, PhD

Administrative Director
Bobbi Billings

Community Liaison
Holly Eaton

June 4, 2012

Mr. Paul Howard
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Mr. Howard,

Penobscot East Resource Center submits the following comments on Amendment 5 to the Herring FMP: We are in overall support of what this amendment intends to accomplish: Better reporting measurements, maximizing at-sea sampling, addressing net slippage and river herring bycatch, and establishing criteria for access to groundfish closed areas all align with Penobscot East's work to help rebuild local groundfish stocks in Eastern Maine.

Groundfish stocks in Eastern Maine have suffered greatly over the past twenty five years, with possible causes including overfishing, loss of essential habitat, and depletion of important forage fish such as river herring, which appear to be caught as bycatch in the Atlantic herring fishery in large numbers. Regardless of whether the decline of river herring contributed to the decline of local groundfish populations, a concerted effort to protect river herring could only enhance groundfish rebuilding in this and other coastal regions, thus working to diversify opportunities for fishermen.

We support the implementation of 100% observer coverage for Category A and B vessels. Collection of real-time, accurate catch information at sea will improve the ability of fishery managers to make better, more informed decisions aimed at reducing river herring and groundfish bycatch in the Atlantic herring fishery. It is imperative that groundfish bycatch in this fishery be reduced and better accountability measures be implemented. Groundfish bycatch data will also be valuable to the upcoming work on cod stock structure.

This data would also address bycatch of river herring such as alewives. Alewives are a species of concern, their populations down drastically over the past twenty years - concurrent with the loss of some coastal groundfish populations. When alewives leave their spawning grounds in the river systems of coastal Maine, we do not know if or how they mix at sea. In order to better understand their stock structure and life history, at-sea data collection must be improved.

Penobscot EAST Resource Center

PO Box 27
13 Atlantic Avenue
Stonington, ME 04681
(207) 367-2708
www.penobscoteast.org

Securing a future for fishing communities

As a region, we need to be doing all we can to reduce river herring bycatch and protect these species while they are at sea. NMFS approved observers deployed on these vessels will obtain accurate catch information, and collect biological samples needed to further studies on stock structure.

We also support prohibition of mid-water trawl access to groundfish closed areas. These areas provide protection for spawning and juvenile recruitment. It is counterproductive to have a small mesh fishery towing through areas that are so important to the well being of many year classes of groundfish.

We believe there should be strict disincentives for net slippage in Closed Area I, with trip termination after ten events. Used in conjunction with 100% observer coverage, this would not only discourage slippage events, but provide further accurate catch information and accountability for high bycatch events. Net slippage should only be used when catch is deemed "too dangerous" to bring onboard, a standard that should remain high-bar, and rarely used. Overuse of this standard would render it meaningless. Under current NEFOP observer procedures, observers must obtain a visual description of the catch composition during a slippage event, and ask the captain of the vessel to make comments about the event to include in the trip data. This procedure used on herring vessels would provide valuable information on overall slippage events in the fishery.

We support the implementation of improved dealer reporting, including the weighing of all catch at the dock. This data can be cross-referenced with observer data for the overall improvement of accurate landings information. Better landings information translates to better population estimates, thus better management of stocks.

The Atlantic herring fishery is one of extreme importance to the Gulf of Maine and the economy of the region. The herring resource supports many other fisheries and industries across New England, particularly as a forage fish for groundfish and tuna, and as bait in the lobster fishery. As a region, we need to be moving toward methods that improve fisheries interactions with one-another, toward better management that incorporates ecosystem, rather than single-species dynamics. The management measures outlined in Amendment 5 that are referenced in this letter will have minimal negative impact on the herring fishery, and will improve full-catch accountability, science, and enable a needed shift toward ecosystem based fisheries management.

Sincerely,

Patrick Shepard
Fisheries Policy Associate
Penobscot East Resource Center

ISLAND INSTITUTE

386 MAIN STREET
POST OFFICE BOX 648
ROCKLAND, MAINE 04841-00648
TEL 207-594-9209 FAX 207-594-9314
EMAIL inquiry@islandinstitute.org
www.islandinstitute.org

June 1, 2012

New England Fisheries Management Council
50 Water Street
Newburyport MA, 01950

RE: Draft Amendment 5 to the Atlantic Herring FMP

Dear Chairman Cunningham:

The Island Institute is a community development organization that focuses on supporting Maine's 15 year-round island communities and coastal working waterfront communities. The economy of these communities is heavily focused on the natural resources of the Gulf of Maine and their future is closely tied to the sustainability of the ecosystem. Herring management is a microcosm for the future of the Gulf of Maine. Our coastal communities, fisheries, and the long-term sustainability of the ecosystem are inextricably linked.

Herring are a cornerstone species in the Gulf of Maine ecosystem and numerous species of fish, birds, and marine mammals rely on herring as part of their diet. One of the most important uses of herring in Maine is for bait in the lobster industry. Lobstering allows many families to live on the islands and the industry provides critical employment opportunities in Maine's coastal communities. Maine has around 5,000 licensed commercial lobstermen and by law, each lobsterman is a separate, owner-operated small business.

In considering the management options in Draft Amendment 5, I encourage you add measures that reduce the amount of uncertainty in herring management and allow fisheries managers to better manage the fish stocks. Specifically, we recommend:

- Include 100 % observer coverage on category A and B vessels (Section 3.2.1 Alternative 2), since these vessels land the vast majority of herring (~97 - 98 %). In addition to monitoring the herring catch, this level of observer coverage would provide reliable estimates of river herring and other bycatch. Significant increases in observer coverage on smaller vessels that land far fewer herring could place an inordinate amount of financial strain on individual fishermen. As a general matter, decisions about observer coverage and monitoring should be made in the context of the potential environmental impact of the activity. Different scales of fishing activity have different environmental impacts, and it is the

potential for impacts to the fish stock that should drive decisions surrounding observer coverage.

- All catch should be accurately weighed and reported (Section 3.1.5 Alternative 2) so that managers have an accurate sense of what is happening to the fish stocks. With this information, they can stop fishing at the right moment in a certain area to maximize the amount of herring that can be caught, while at the same time preventing too much herring from being removed from the ecosystem.

- Prohibit mid-water trawl vessels from participating in the herring fishery in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5). New knowledge regarding the frequency and severity of mid-water trawls on the seafloor and higher rates of haddock bycatch inside CAII compared to outside CAII (calculated in the FW46 analysis) support this alternative. Any exceptions for herring mid-water trawl vessels should be subject to the same appropriately high standards met by groundfishermen who are granted Experimental Fisheries Permits, including but not limited to catch and bycatch caps and increased observer coverage.

- Include robust management measures to protect river herring in the Atlantic herring fishery, such as a catch cap (by modifying Section 3.3.5), in an effort to keep Maine's healthy, sustainable, in-river fishery.

- Regulate the number of allowed net slippage events for Category A and B vessels (such as Section 3.2.3.4 Option 4D). I encourage you to adopt an accountability system that discourages wasteful dumping and allows for accurate estimation of total catch and, thus, support the concept of a maximum number of allowed slippage events. The Island Institute is not qualified to comment on the exact number of events that would be appropriate, but we feel strongly that fishermen's safety, not economic concerns, should be the driving factor in making this determination.

In considering changes to the herring management, I encourage you to undertake these changes to ensure that a sustainable harvest of this critical forage and baitfish will be available for years into the future. It is vitally important to the ecosystem of the Gulf of Maine as well as to Maine's island and working waterfront communities that local sources of bait are sustainably managed.

Sincerely,

Nick Battista

Nick Battista
Marine Programs Director

June 4, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, Massachusetts 01950

Dear Mr. Howard,

As organizations, businesses and individuals that are greatly concerned with the health and sustainability of our fisheries, and the ecosystems that support those fisheries, we write to urge your support for strong protections for river herring in the Atlantic herring fishery.

River herring abundance has dramatically declined along the Atlantic coast, including in New Hampshire, where the number of fish returning to the Taylor, Oyster and Exeter Rivers are at historically low levels. While many factors have led to this decline, we are particularly concerned about the lack of effective protection for these fish in ocean waters, particularly beyond three miles of the coast. According to the Northeast Fisheries Science Center, approximately four million river herring are incidentally caught each year, with the majority caught by single and pair mid-water trawl vessels fishing for Atlantic herring and mackerel.

Our organizations and the members we represent are committed to the conservation and sustainable harvest of river herring in New Hampshire. The New Hampshire Fish and Game Department and New Hampshire Department of Environmental Services, in collaboration with watershed organizations and other stakeholders, are currently working to remove dams, restore fish passage, and improve the health of rivers to promote the recovery of river herring and other diadromous fish. In addition, New Hampshire has developed and implemented river-specific harvest plans, approved by the Atlantic States Marine Fisheries Commission, to maintain a sustainable and successful river herring fishery.

To complement these efforts – and similar efforts in other Atlantic coast states – we respectfully request that the Council implement a plan that effectively monitors and limits the incidental capture of river herring in waters under your jurisdiction. Specifically we ask that you approve the following management measures in Amendment 5 to the Atlantic Herring Fishery Management Plan:

- 100% monitoring on all single and pair mid-water trawlers to collect reliable and accurate data on all catch.
- Immediate implementation of a river herring catch cap.
- A limit on the dumping or release of catch before it can be sampled by an independent observer (five released catch events per management area).
- A requirement to weigh all landed catch.

We thank you for the work that you, your staff and the Council do protect and restore sustainable fisheries and urge you to take this opportunity to do the same for river herring.

Sincerely,

Peter Wellenberger
Great Bay-Piscataqua WATERKEEPER
Conservation Law Foundation
Durham, New Hampshire

Michael J. Bartlett
President
Audubon Society of New Hampshire
Concord, New Hampshire

Rep. Derek Owen
President
Citizens for a Future New Hampshire
Hopkinton, New Hampshire

Caroline Snyder, Ph.D.
Chair
Citizens for Sludge-Free Land
North Sandwich, New Hampshire

Ben Steele
Professor and Chair
Department of Natural Sciences
Colby-Sawyer College
New London, New Hampshire

Jessica O'Hare
Environment New Hampshire
Concord, New Hampshire

Josh Arnold
Coordinator
Global Awareness Local Action
Ossipee, New Hampshire

Mitch Kalter
President
Great Bay Trout Unlimited
Dover, New Hampshire

Sharon Meeker
Lamprey Rivers Advisory Committee Wild &
Scenic Rivers Program
Lee, New Hampshire

Sarah Brown
Project Director
Green Alliance
Portsmouth, New Hampshire

Beth Flagler
New Hampshire Rivers Council
Concord, New Hampshire

Wendy Lull
President
Seacoast Science Center
Rye, New Hampshire

Peter Egelston
President
Smuttynose Brewing Co.
Portsmouth Brewery
Portsmouth, New Hampshire

Roy Morrison
Director
Sustainability Department
Southern New Hampshire University
Manchester, New Hampshire

Dr. Thomas Lee, Ph.D.
Professor of Marine Biology (ret.)
St. Anselm College
Goffstown, New Hampshire

Roger Burkhart, Reverend
The United Church of Christ
Milton, New Hampshire

Dr. William Burgess Leavenworth, Ph.D.
Historical Marine Ecologist
University of New Hampshire

Jean Eno
Project Director
Winnicut River Watershed Coalition
North Hampton, Stratham & Greenland, New
Hampshire

cc: Doug Grout, Chief, NH Fish & Game Department
Cherri Patterson, Supervisor, NH Fish & Game Department

June 4, 2012

Mr. Paul J. Howard
Executive Director
New England Fishery Management Council

RE: Comments on Draft Amendment 5

Dear Mr. Howard:

On January 19, 2011, nineteen Massachusetts watershed associations (as well as some from other New England states) wrote to request that the New England Fishery Management Council consider a comprehensive range of options in Amendment 5 to address river herring bycatch and improvements to catch monitoring in the Atlantic herring fishery. We very much appreciate that the Council did just that. We now urge you to adopt those measures that are most effective for monitoring and minimizing interactions with river herring. Specifically, we support:

- 100% monitoring on all midwater trawl fishing trips to ensure accurate sampling of river herring catches.
- A catch cap on the amount of river herring that can be caught in the Atlantic herring fishery for immediate implementation in the next fishing year, 2013.
- No release or dumping of unsampled catch (i.e., observers should have access to all catch for sampling). The Council should also adopt an accountability system to ensure that the exceptions for mechanical failure and safety are not abused. We would like to see no more than 5 dumping events per management area permitted, after which any release/dumping of catch would require vessels to return to port.
- A requirement to weigh all landed catch.
- No midwater trawling in areas established to promote groundfish rebuilding.

Our organizations have been working for years to restore historic herring runs to our rivers and streams through removal of dams and other obstructions, and improvements in water quality. Yet despite improvements in many of our inland waters, herring runs have continued to decline to historically low levels. We are convinced that at-sea bycatch is one of the reasons. We know that hundreds of thousands of river herring are sometimes caught and killed by midwater trawlers in a single tow; that is far more than come up the great majority of our rivers and streams today. We urge you to take strong action now, before it is too late.

Sincerely,

Ian Cooke
Executive Director
Neponset River Watershed Association
Canton, MA

Art Benner
President
Alewives Anonymous, Inc.
Rochester, MA

Ed DeWitt
Executive Director
The Association to Preserve Cape Cod
Barnstable, MA

Frederic B. Jennings Jr., Ph.D.
Center for Ecological Economic and Ethical Education
Ipswich, MA

Renata von Tscharner
President
Charles River Conservancy
Cambridge, MA

Robert Zimmerman, Jr.
Executive Director
Charles River Watershed Association
Weston, MA

Ben Wright
Environment Massachusetts
Boston, MA

Jon Nash
Founding member, Duxbury Management Commission
Founder, Duxbury One Fly
Duxbury, MA

Ken Pruitt
Managing Director
Environmental League of Massachusetts
Boston, MA

Judy Lehrer Jacobs
Executive Director
Friends of the Blue Hills
Milton, MA

Don Palladino
President
Friends of Herring River
Wellfleet & Truro, MA

Tim Bennett
President
Green Futures
Fall River, MA

Lynn Werner
Executive Director
Housatonic Valley Association
Lee, MA

Pine DuBois
Executive Director
Jones River Watershed Association
Kingston, MA

Joan Crowell
President
Leesville Pond Watershed and Neighborhood Association
Worcester, MA

Linda Orel
Executive Director
Mass Association of Conservation Commissions
Belmont, MA

Brianne Callahan
Executive Director
Massachusetts Baykeeper
Watertown, MA

Ed Himlan
Executive Director
Massachusetts Watershed Coalition
Leominster, MA

EkOngKar Singh Khalsa
Executive Director
Mystic River Watershed Association
Arlington, MA

Carol Carson
President
New England Coastal Wildlife Alliance
Middleboro, MA

Samantha Woods
Executive Director
North and South Rivers Watershed Association
Norwell, MA

Alison Field-Juma
Executive Director
OARS (Assabet, Sudbury and Concord Rivers)
Concord, MA

Rob Moir, Ph.D.
Executive Director
Ocean River Institute
Cambridge, MA

George Comiskey
President
Parker River Clean Water Association
Byfield, Massachusetts

John Duane – on behalf of:
Town of Wellfleet Natural Resources Advisory Board &
Shellfish Advisory Board
Wellfleet, MA

Hillary Greenburg Lemos
Wellfleet Conservation Commission
Wellfleet, MA

Matthew C. Patrick
Executive Director
Westport River Watershed Alliance
Westport, MA

cc: Doug Grout, NEFMC Herring Committee Chair
DMF Director Paul Diodati
DMF Deputy Director David Pierce

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

OFFICE OF THE
REGIONAL ADMINISTRATOR

June 4, 2012

Daniel S. Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, Massachusetts 01930-9135

Re: Draft Environmental Impact Statement for Draft Amendment 5 to the Fishery Management Plan for Atlantic Herring, CEQ# 20120104

Dear Mr. Morris:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, we have reviewed the Draft Environmental Impact Statement (DEIS) for Draft Amendment 5 to the Fishery Management Plan for Atlantic Herring. Based on our review of the DEIS we have no objections to the project as described and we rate this EIS "LO-1 - Lack of Objections–Adequate" in accordance with EPA's national rating system, a description of which is attached to this letter.

Thank you for the opportunity to review the DEIS. Please contact me at (617) 918-1025 with any comments or questions about this letter.

Sincerely.

Timothy L. Timmermann
Associate Director
Office of Environmental Review

enclosure

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC–Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3–Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:19 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: Comments in support of river herring conservation, Amendment 5 & Amendment 14

NMFS received 936 letters identical to this one.

---------- Forwarded message ----------
From: **Deanne O'Donnell** <hottdeanne@hotmail.com>
Date: Tue, Jun 5, 2012 at 2:11 PM
Subject: Comments in support of river herring conservation, Amendment 5 & Amendment 14
To: heramendment5@noaa.gov

Dear Mr. Howard,

Dear Regional Managers,

I'm very concerned about the impacts of industrial fishing on river herring.
I would very much appreciate it if you would adopt a comprehensive monitoring and bycatch reduction program for river herring, which I'm told are not currently considered in your management of either the Atlantic herring fishery or the Mackerel, Squid, Butterfish fishery. I think it's great that most Atlantic states now ban the catch of river herring in state waters, but it worries me that these efforts are not matched in federal waters. Large scale fisheries such as these can have major impacts, and should be monitored and managed carefully to minimize impacts to not only river herring, but other species like groundfish. I support your initiative to improve this aspect of both these fisheries.

Specifically, if the monitoring and bycatch reduction program you adopt could include the following, I would be much obliged. Here's what I'd like to see the New England Fishery Management Council adopt:
• A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
• 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
• An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleet-wide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
• A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
• A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

As for the Mid-Atlantic Fishery Management Council, I encourage you to adopt the following options:
• Inclusion of river herring and shad as stocks within the fishery (Alternative 9b-9e).
• Developing the long-term protections associated with this designation will take time. Therefore, the council should adopt the following interim measure to immediately reduce and limit the at-sea catch of river herring and shad:
• A catch cap, effective in 2013 (Alternative 6b-6c), that functions effectively, does not increase wasteful discarding, and cannot be circumvented by simply declaring into another fishery. These alternatives should be

modified to more effectively ensure that directed mackerel fishing stops if a cap is reached by lowering the amount of mackerel that can be fished for, possessed, or retained.

Furthermore, I strongly urge you to incorporate all of the following:
• 100 percent at-sea monitoring on all mid-water trawl fishing trips. One observer must be assigned to each vessel in a pair trawl operation (Alternative 5b4 and Alternative 3d).
• An accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling (Alternative 3j with operational discards prohibited). If dumping is allowed, include a fleet-wide limit of 10 dumping events (Alternative 3l and 3n) and require vessels that dump to take an observer on their next trip (Alternative 3o).
• A requirement to weigh all catch. (Alternative 2c-2f).

Thank you for considering my input, and I look forward to applauding your wise decision.

Sincerely,

Deanne O'Donnell
1177 Spruce Street
Greensburg, PA 15601

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:19 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: Comments in support of river herring conservation, Amendment 5 & Amendment 14

---------- Forwarded message ----------
From: **Jane** <janesrygley@yahoo.com>
Date: Tue, Jun 5, 2012 at 10:15 AM
Subject: Re: Comments in support of river herring conservation, Amendment 5 & Amendment 14
To: HER Amendment5 <heramendment5@noaa.gov>

My comment was obviously from an activist organization but I meant every word of it. Please do whatever you can to end over-fishing.

thank you,

Jane Srygley

None are more hopelessly enslaved than those who falsely believe they are free. ~ Goerthe

> **From:** HER Amendment5 <heramendment5@noaa.gov>
> **To:** janesrygley@yahoo.com
> **Sent:** Monday, June 4, 2012 11:13 AM
> **Subject:** Re: Comments in support of river herring conservation, Amendment 5 & Amendment 14
>
> Thank you for your comment on Amendment 5 to the Atlantic Herring
> Fishery Management Plan.

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:20 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: What should be done

---------- Forwarded message ----------
From: **eric olson** <souljahdnb@gmail.com>
Date: Mon, Jun 4, 2012 at 9:20 PM
Subject: What should be done
To: HerAmendment5@noaa.gov

The following actions should be approved:

· **100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, striped bass, bluefish, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).**

· **Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Rules must be put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)**

· **Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. (Section 3.4.4 Alternative 5)**

· **Implement measures to require weighing of catch across the fishery. (Section 3.5.1 Option 2)**

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:20 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: Comments in support of river herring conservation, Amendment 5 & Amendment 14

---------- Forwarded message ----------
From: **Carol Halberstadt** <carol@migrations.com>
Date: Mon, Jun 4, 2012 at 8:01 PM
Subject: Comments in support of river herring conservation, Amendment 5 & Amendment 14
To: heramendment5@noaa.gov

Dear Mr. Howard,

Dear Regional Managers,

I'm very concerned about the impacts of industrial fishing on river herring.

On behalf of this crucial fish, I ask you to adopt a comprehensive monitoring and bycatch reduction program for river herring, which I'm told are not currently considered in your management of either the Atlantic herring fishery or the Mackerel, Squid, Butterfish fishery. I think it's great that most Atlantic states now ban the catch of river herring in state waters, but it worries me that these efforts are not matched in federal waters. Large-scale fisheries such as these can have major impacts, and should be monitored and managed carefully to minimize impacts to not only river herring, but other species like groundfish. I support your initiative to improve this aspect of both these fisheries.

Specifically, if the monitoring and bycatch reduction program you adopt could include the following, I would be deeply grateful, because life in our waters would benefit enormously. Here's what I'd like to see the New England Fishery Management Council adopt:
• A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
• 100% at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
• An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
• A ban on herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
• A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

As for the Mid-Atlantic Fishery Management Council, I encourage you to adopt the following options:
• Inclusion of river herring and shad as stocks within the fishery (Alternative 9b-9e).
• Developing the long-term protections associated with this designation will take time. Therefore, the council should adopt the following interim measure to _immediately_ reduce and limit the at-sea catch of river herring and shad:

• A catch cap, effective in 2013 (Alternative 6b-6c), which functions effectively, does not increase wasteful discarding, and cannot be circumvented by simply declaring into another fishery. These alternatives should be modified to more effectively ensure that directed mackerel fishing stops if a cap is reached by lowering the amount of mackerel that can be fished for, possessed, or retained.

Furthermore, I strongly urge you to incorporate all of the following:
• 100% at-sea monitoring on all midwater trawl fishing trips. One observer must be assigned to each vessel in a pair trawl operation (Alternative 5b4 and Alternative 3d).
• An accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling (Alternative 3j with operational discards prohibited). If dumping is allowed, include a fleetwide limit of 10 dumping events (Alternative 3l and 3n) and require vessels that dump to take an observer on their next trip (Alternative 3o).
• A requirement to weigh all catch. (Alternative 2c-2f).

Thank you for considering my input, and I look forward to applauding your wise decision.

"But ask now the animals, and they shall teach you; and the birds of the sky, they will tell you. Or speak to the earth and it will teach you; and the fishes of the sea shall inform you." (--Job 12:7-8)

For life on Earth,

Sincerely,

Carol Halberstadt
POB 543
Newton, MA 02458

June 4, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, Massachusetts 01950

Dear Mr. Howard,

As organizations, businesses and individuals that are greatly concerned with the health and sustainability of our fisheries, and the ecosystems that support those fisheries, we write to urge your support for strong protections for river herring in the Atlantic herring fishery.

River herring abundance has dramatically declined along the Atlantic coast, including in New Hampshire, where the number of fish returning to the Taylor, Oyster and Exeter Rivers are at historically low levels. While many factors have led to this decline, we are particularly concerned about the lack of effective protection for these fish in ocean waters, particularly beyond three miles of the coast. According to the Northeast Fisheries Science Center, approximately four million river herring are incidentally caught each year, with the majority caught by single and pair mid-water trawl vessels fishing for Atlantic herring and mackerel.

Our organizations and the members we represent are committed to the conservation and sustainable harvest of river herring in New Hampshire. The New Hampshire Fish and Game Department and New Hampshire Department of Environmental Services, in collaboration with watershed organizations and other stakeholders, are currently working to remove dams, restore fish passage, and improve the health of rivers to promote the recovery of river herring and other diadromous fish. In addition, New Hampshire has developed and implemented river-specific harvest plans, approved by the Atlantic States Marine Fisheries Commission, to maintain a sustainable and successful river herring fishery.

To complement these efforts – and similar efforts in other Atlantic coast states – we respectfully request that the Council implement a plan that effectively monitors and limits the incidental capture of river herring in waters under your jurisdiction. Specifically we ask that you approve the following management measures in Amendment 5 to the Atlantic Herring Fishery Management Plan:

- 100% monitoring on all single and pair mid-water trawlers to collect reliable and accurate data on all catch.
- Immediate implementation of a river herring catch cap.
- A limit on the dumping or release of catch before it can be sampled by an independent observer (five released catch events per management area).
- A requirement to weigh all landed catch.

We thank you for the work that you, your staff and the Council do protect and restore sustainable fisheries and urge you to take this opportunity to do the same for river herring.

Sincerely,

Peter Wellenberger
Great Bay-Piscataqua WATERKEEPER
Conservation Law Foundation
Durham, New Hampshire

Michael J. Bartlett
President
Audubon Society of New Hampshire
Concord, New Hampshire

Rep. Derek Owen
President
Citizens for a Future New Hampshire
Hopkinton, New Hampshire

Caroline Snyder, Ph.D.
Chair
Citizens for Sludge-Free Land
North Sandwich, New Hampshire

Ben Steele
Professor and Chair
Department of Natural Sciences
Colby-Sawyer College
New London, New Hampshire

Jessica O'Hare
Environment New Hampshire
Concord, New Hampshire

Josh Arnold
Coordinator
Global Awareness Local Action
Ossipee, New Hampshire

Mitch Kalter
President
Great Bay Trout Unlimited
Dover, New Hampshire

Sharon Meeker
Lamprey Rivers Advisory Committee Wild &
Scenic Rivers Program
Lee, New Hampshire

Sarah Brown
Project Director
Green Alliance
Portsmouth, New Hampshire

Beth Flagler
New Hampshire Rivers Council
Concord, New Hampshire

Wendy Lull
President
Seacoast Science Center
Rye, New Hampshire

Peter Egelston
President
Smuttynose Brewing Co.
Portsmouth Brewery
Portsmouth, New Hampshire

Roy Morrison
Director
Sustainability Department
Southern New Hampshire University
Manchester, New Hampshire

Dr. Thomas Lee, Ph.D.
Professor of Marine Biology (ret.)
St. Anselm College
Goffstown, New Hampshire

Roger Burkhart, Reverend
The United Church of Christ
Milton, New Hampshire

Dr. William Burgess Leavenworth, Ph.D.
Historical Marine Ecologist
University of New Hampshire

Jean Eno
Project Director
Winnicut River Watershed Coalition
North Hampton, Stratham & Greenland, New
Hampshire

cc: Doug Grout, Chief, NH Fish & Game Department
Cherri Patterson, Supervisor, NH Fish & Game Department

June 4, 2012

Captain Paul J. Howard
Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Capt. Howard:

The undersigned organizations – representing a broad range of conservation groups, watershed associations, anglers, and recreational enthusiasts working to protect and restore Long Island Sound and its tributaries – urge the New England Fishery Management Council (NEFMC) adopt the strongest possible protections for river herring in the Atlantic herring fishery.

Long Island Sound's rivers and waterways once supported prolific runs of alewife and blueback herring, but in recent decades the number of fish returning to rivers each year has dramatically declined, to the point that they are now being considered for listing under the Endangered Species Act[1]. According to the Connecticut Department of Energy and Environmental Protection (DEEP), millions of river herring once returned annually to Connecticut, but environmental officials say that by 2006, only 21 passed the Holyoke Dam on the Connecticut River[2]. According to the Long Island Sound National Estuary Program, herring populations have declined precipitously in all Long Island Sound rivers over the past few decades.[3] Today, their numbers have dwindled to the point that monitoring this spring (between March and May 1, 2012) at 13 coastal rivers, generally considered to be the Sound's most productive herring river runs, recorded a total number of alewife and blueback herring of less than 500,000.[4]

River herring – both alewife and blueback herring – are a key component of the food web of the Sound. Not only are they critical forage food for our major Sound game fish – striped bass and blue fish – but a wide array of coastal birds and other wildlife feed on a combination of adult or young herring.

For these reasons, our organizations, in collaboration with the Connecticut DEEP and the New York Department of Environmental Conservation, have worked diligently to open rivers and streams that feed into the Sound, with substantial success. This public-private partnership has already opened up more than 150 miles of valuable freshwater spawning habitat that was previously blocked by dams. In addition, we continue to support the State of New York's exploration, and the State of Connecticut's continued renewal, of a moratorium on river herring harvest in the Sound. While we do everything we can to open up more breeding habitat and conserve herring in our coastal areas, this alone is not enough. We know our herring spend most of their adult life in the north Atlantic. Therefore, their

---

[1] NOAA Release, November 1, 2011, announcing consideration of listing river herring under ESA
[2] CT DEEP Press Release of April 3, 2012, announcing continuation of ban on river herring harvest.
[3] Long Island Sound Study, *Sound Update*, May/June 2009
[4] CT DEEP, Weekly Diadromous Fish Report, May 1, 2012

recovery is dependent on your Council providing strong protections for herring throughout this north Atlantic area.

We believe that ocean bycatch is a significant concern, a finding that was recently confirmed by the 2012 River Herring Stock Assessment and Peer Review. Data obtained by the Northeast Fisheries Observer Program shows that between 2 and 5 million alewife and blueback herring were caught annually between 2005 and 2010, with the majority taken in the single and paired midwater trawl fishery for Atlantic herring in New England[5]. In some instances, hundreds of thousands of river herring have been removed in single net tows[6]. Considering that up to a half million river herring can be destroyed by a single net tow, this is the rough equivalent of the total number of river herring monitored this spring passing up 13 of Long Island Sound's most productive rivers. [7] These statistics are alarming and warrant immediate management measures that will promote the conservation and recovery of these species. To this end, we offer the following recommendations to improve monitoring and limit catch of river herring in the Atlantic herring fishery.

Set a limit on river herring catch: As mentioned above, the recent stock assessment concluded that ocean catch of river herring can be substantial; amounting to millions of fish caught each year. As a federally-listed species of concern and candidates for listing under the Endangered Species Act, river herring should be given the strongest protections possible, including setting a limit in the next fishing year.

Support 100% monitoring on all midwater trawl vessels: Single and pair midwater trawling for herring has raised serious concerns in the region due to their enormous catching capacity and potential impacts to depleted river herring and the overall health and productivity of the marine ecosystem. Comprehensive catch monitoring, including a requirement for scientific observers on all midwater trawlers, will greatly enhance data collection and lead to better estimates of all catch, including bycatch of river herring.

Strengthen accountability on dumping of unmonitored catch: The dumping of unobserved catch (i.e., release or slipping catch at sea) should be minimized to the maximum extent practicable to support accurate sampling and catch reporting. Herring vessels should be required to make all catch available for sampling by an observer. Strong accountability measures, such as limiting the fleet to five slipped catch events per management area, should be adopted as a disincentive to dumping catch at sea.

Require weighing and reporting of all catch: All catch delivered to port should be weighed and independently verified to ensure accurate reporting and assessment of bycatch.

If you have any questions or comments about the substance of these comments, do not hesitate to contact Curt Johnson at 203 787 0646. We appreciate your consideration of our concerns and thank you for your continued leadership and commitment to the sustainable management and conservation of our State's natural resources.

---

[5] River Herring Benchmark Assessment Report, May 2012

[6] Data obtained from the Northeast Fisheries Observer Program

[7] CT DEEP, Weekly Diadromous Fish Report, May 1, 2012

Sincerely,

Curt Johnson
Program Director
Save the Sound, a program of Connecticut Fund for the Environment
New Haven, CT

Margaret Miner
Executive Director
Rivers Alliance of CT
Litchfield, CT

Adrienne Esposito
Executive Director
Citizens Campaign for the Environment
New York & Connecticut

Sandy Breslin
Director of Governmental Affairs
Audubon Connecticut
Greenwich, CT

Albert E. Caccese
Executive Director
Audubon New York
Albany, NY

Carol DiPaolo
Executive Director
Coalition to Save Hempstead Harbor
Sea Cliff, NY

John Rumpler
Environment Connecticut
West Hartford, CT

Eileen Fielding
Executive Director
Farmington River Watershed Association
Simsbury, CT

Mary V. Rickel Pelletier
Executive Director
Park Watershed
Hartford, CT

Patricia Aitken
Executive Director
Friends of Oyster Bay
Oyster Bay, NY

Lynn Werner
Executive Director
Housatonic Valley Association
Cornwall Bridge, CT

Jennifer E. Herring
President and CEO
The Maritime Aquarium
Norwalk, CT

Jack Stoecker
President
Mianus River Watershed Council
Greenwich, CT

Robert Gregorski
President
Naugatuck River Watershed Association
Naugatuck, CT

Kevin Zak
President
Naugatuck River Revival Group
Naugatuck, CT

Bill Duesing, Executive Director
Northeast Organic Farming Association,
Connecticut Chapter
Stevenson, CT

Rep. Mary Mushinsky
Science Educator
Quinnipiac River Watershed Association
Meriden, CT

Michael E. McGuiness
Member
Branford Conservation Commission
Branford, CT

Charles Adams
Connecticut Watershed Conservation Network
Westport, CT

Diane Edwards
Connecticut Watershed Conservation Network
Thomaston, CT

Sarah Gager
Connecticut Watershed Conservation Network
Washington, CT

Mary T. Keane
Connecticut Watershed Conservation Network
Trumbull, CT

Arthur F. Lirot
Connecticut Watershed Conservation Network
Litchfield, CT

Bernie Noonan
Connecticut Watershed Conservation Network
East Hampton, CT

Martha Smith
Connecticut Watershed Conservation Network
New Haven, CT

Russell Dirienzo
Selectman and Chairman
Inland Wetlands and Watercourses Commission
Roxbury, CT

Marianne Corona
Member
Coginchaug WHP Implementation Committee &
Middlefield Inland Wetlands and Watercourses Commission
Middlefield, CT

Herb Gram
Member
Long Island Sound Assembly Regional Council
Madison, CT

Mickey Weiss, Ph.D.
Senior Marine Scientist
Project Oceanology
Groton, CT

David Pattee
Chairman, Redding Conservation Commission &
Representative to Saugatuck Watershed Partnership
Redding, CT

Hugh Rawson
Member and Past Chairman
Roxbury Conservation Commission
Roxbury, CT

Daniel Snyder, Ph.D.
Shoreline Shellfish, LLC &
Sound Marine Skills, Inc.
Branford, CT

Tim Visel
Coordinator
The Sound School
New Haven, CT

Ted L. Gardziel
Member and Past President
Trout Unlimited Hammonasset Chapter
Guilford, CT

Don Watson
Trumbull Conservation Commission
Trumball, CT

Steve Gangi
Wetlands Commissioner, Town of Branford
Branford, CT

Gaboury Benoit
Professor
Yale School of Forestry and the Environment
New Haven, CT

CC:

Director David G. Simpson, Marine Fisheries Division, Connecticut DEEP
Mark Alexander, Supervising Fisheries Biologist, Connecticut DEEP
Doug Grout, Herring Committee Chair, NEFMC

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:22 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: Herring Amendment V

---------- Forwarded message ----------
From: **Pat Sadr** <pat.sadr@gmail.com>
Date: Mon, Jun 4, 2012 at 1:14 PM
Subject: Herring Amendment V
To: HerAmendment5@noaa.gov

To the Committe ruling on Herring Regulations Amendment V,

The following actions should be approved:

· 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, striped bass, bluefish, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

· Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Rules must be put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

· Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. (Section 3.4.4 Alternative 5)

· Implement measures to require weighing of catch across the fishery. (Section 3.5.1 Option 2)

From:
Patrick Sadr
Concerned Fisherman

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:23 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: CONSERVE river herring conservation. Info on Amendments 5 and 14.

---------- Forwarded message ----------
From: **Glen Anderson** <glen@olywa.net>
Date: Mon, Jun 4, 2012 at 12:20 PM
Subject: CONSERVE river herring conservation. Info on Amendments 5 and 14.
To: heramendment5@noaa.gov

Dear Mr. Howard,

Dear Regional Managers,

Industrial fishing is DESTROYING the sustainability of river herring.

I call upon you to adopt a comprehensive monitoring and bycatch reduction program for river herring.

Currently you are failing to address this serious concern.

When you manage the Atlantic herring fishery and the Mackerel, Squid, Butterfish fishery, I URGE YOU TO PROTECT RIVER HERRING.

Most Atlantic states prohibit cathing river herring in state waters, but I CALL UPON YOU TO PROTECT RIVER HERRING IN FEDERAL WATERS TOO.

Specifically, if the monitoring and bycatch reduction program you adopt could include the following, I would be much obliged. Here's what I'd like to see the New England Fishery Management Council adopt:
• A catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, modified to require immediate implementation of a catch cap).
• 100 percent at-sea monitoring on all midwater trawl fishing trips in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).
• An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleet-wide limit of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).
• A ban on herring mid-water trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).
• A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

As for the Mid-Atlantic Fishery Management Council, I encourage you to adopt the following options:
• Inclusion of river herring and shad as stocks within the fishery (Alternative 9b-9e).
• Developing the long-term protections associated with this designation will take time. Therefore, the council should adopt the following interim measure to immediately reduce and limit the at-sea catch of river herring and

shad:
• A catch cap, effective in 2013 (Alternative 6b-6c), that functions effectively, does not increase wasteful discarding, and cannot be circumvented by simply declaring into another fishery. These alternatives should be modified to more effectively ensure that directed mackerel fishing stops if a cap is reached by lowering the amount of mackerel that can be fished for, possessed, or retained.

Furthermore, I strongly urge you to incorporate all of the following:
• 100 percent at-sea monitoring on all mid-water trawl fishing trips. One observer must be assigned to each vessel in a pair trawl operation (Alternative 5b4 and Alternative 3d).
• An accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling (Alternative 3j with operational discards prohibited). If dumping is allowed, include a fleet-wide limit of 10 dumping events (Alternative 3l and 3n) and require vessels that dump to take an observer on their next trip (Alternative 3o).
• A requirement to weigh all catch. (Alternative 2c-2f).

Thank you for considering my input, and I look forward to applauding your wise decision.

Sincerely,

Glen Anderson
5015 15th Ave SE
Lacey, WA 98503

Joan O'Leary

From: HER Amendment5 <heramendment5@noaa.gov>
Sent: Tuesday, June 05, 2012 2:23 PM
To: Rachel A. Neild; Joan O'Leary
Subject: Fwd: Comments in support of river herring conservation, Amendment 5 & Amendment 14

---------- Forwarded message ----------
From: **Jill Brotman** <jrbrotman@msn.com>
Date: Mon, Jun 4, 2012 at 11:57 AM
Subject: Comments in support of river herring conservation, Amendment 5 & Amendment 14
To: heramendment5@noaa.gov

Dear Mr. Howard,

Dear Regional Managers,

I'm very concerned about the impacts of industrial fishing on river herring.
I would very much appreciate it if you would adopt a comprehensive monitoring and bycatch reduction program for river herring, which I'm told are not currently considered in your management of either the Atlantic herring fishery or the Mackerel, Squid, Butterfish fishery. I think it's great that most Atlantic states now ban the catch of river herring in state waters, but it worries me that these efforts are not matched in federal waters. Large scale fisheries such as these can have major impacts, and should be monitored and managed carefully to minimize impacts to not only river herring, but other species like groundfish. I support your initiative to improve this aspect of both these fisheries.

Thank you for considering my input, and I look forward to applauding your wise decision.

Sincerely,

Jill Brotman
2075 Coventry Road
Cleveland Heights, OH 44118

#3c



New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. "Rip" Cunningham, Jr., *Chairman* | Paul J. Howard, *Executive Director*

Additional Written Comments Received for Herring Amendment 5 Public Comment Period

June 2, 2012

Daniel Morris, Regional Administrator
NMFS Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mr. Morris:

Re: Amendment 5 Public Comment Letter

Enclosed please read my position and supporting data concerning this most critical sbject.

Although I support Amendment 5, I do not think it goes near far enough. Based on all the data, scientific and anecdotal, there is no doubt that this technique employed by the Herring Industry should ***no***t be allowed continue without proper monitoring or at all. I readily understand ***thier*** desire to keep it open - $$$$.

Why I ask , if this technique was banned here on Cape Cod in the 1960's because of its lethality, is it allowed to be used today with bigger faster boats with superior sonar devices?? It makes no sense at all.

It is my intention to continue speaking out against its continued use with a goal of an immediate 3 year moratorium.

I have been involved in all types of "clean fisheries" – yes some that appropriately use nets, for over 50 years. My cousin Charles "Tiggie" Peluso, who recently passed at the age of 86, wrote the book: "Tiggie – The Lure and Lures of a Commercial Fisherman"- I participated in many of those activities as a young man from age 12 through 20 until I entered the service. I have been involved with the Cape Cod fisheries until my present age of 77 and will continue until I am called away to fish Heaven.

I see what is happening here on Cape Cod with River herring , for example. They are at historic lows and falling. So it goes for Stripers, Cod, Haddock, flounder, mackeral.

I am not saying the Net Trawlers are fully to blame but at **500, 000 lbs of sealife per tow over hundresd of tows since about 1990- you do the math! That catch rate is not sustainable without completely decimating all sea life!**

Thank you for being so transparent and allowing us to be heard. We **FULLY** intend to take action and not words! How is it that the rest of the world clearly sees the travesty of this technique?? Take a look at my Internet Petition results that has only been on line for 3 days!!

Sincerely,

Arthur Costonis

Arthur C. Costonis, Ph.D.
PO 458
West Chatham,MA 02669

Email; Striperart@Hotmail.com

JUN - 6 2012

April 30, 2012

Subject: Petition to curtail activity of Monster Tandem Trawler Herring Industry

Content: The monster tandem trawler herring industry is employing techniques which are currently and has already significantly reduced all documented sea life stocks where they operate. They tow in tandem at a high speed a huge net that can capture over ***500,000 pounds of sea life per tow!*** Please see the attached document for more information.

Petition: We the undersigned support immediate legislative action on the following:

- ***Vote <u>Yes</u> on Herring Amendment 5***
- ***Immediately place a three year moratorium on this current technology***
- ***Conduct research to measure the affected sea life in the absence of this technology to precisely define its effects for any further actions required***

Name	***Address***
Rosalie Moretti	P.O. Box 458 W. Chatham MA 02669
Arthur Costonis	70 JERICHO LN. W. CHATHAM, MA 02669
Jo Ann Martin	460 Bishops Terrace, Hyannis, Ma 02601
Deborah Smith	195 Stony Hill Rd Chatham MA 02633
Sarah Malaspina	27 Birch St. Hyannis MA 02601
Koverly Zaremba	1409 Main St; Chatham, MA 02633
Wendy Dutcher	PO Box 1098 W. CHATHAM MA 02669 11 Perrys Way Harwich MA 02645
Gail Tilton	376 Stony Hill Rd. N. Chatham 02650
Madonna Hitchcock	30 Old Harbor Rd Chatham 02633
Caryn Ritchie	2382 Whites Path SY 02665
	7 Jasmine St. Yarmouth Port, Ma. 02675
Sue Martin	184 Depot Road, Harwich MA 02645
Scott Gaynor	20 Longview Dr Orleans MA 02653
Jeffrey Collins	265 OLD HARBOR RD 02633
DEBBIE HEARLE	709 OLD HARBOR RD. N CHATHAM 0265

Name	Address
Ron Heath	709 Old Harbor Ch
Tim Sylvia	40 Violet Glen Rd. S. Yar
Cynthia McCue	12 Reguill Ave, Wenham, MA
Eleanor Andrews	136 Chipping Stone Rd Chath
Maria Williams	74 Main St, Chatham MA 02
Robert M. Nash	12 LAKEWOOD RD. S. YARMOUTH
Lauren Wolk Hall	189 Longview Dr. Centerville 0263
Erin Kenton	8 Matthews Lane S yarmouth M
Donie Burley	1102 Long Rd. 02666 Chatham 02633
Hope O'Brien	117 Old Wharf Rd. N. Chatham
Peggy Black	441 Old Harbor Rd. Chatham 026
Jennifer N. Kinnear	376 Cedar St Chatham 0263
Laura Ryder	49 Sears Rd Chatham Ma 02633
[illegible]	17 STRIPER LN CHATHAM MA 02
LCdr James Geiger	15 Bay Ln Chatham, 02633
Janine Smeedy	43 mayflower Terrace S. yarmou 026
Katelynn McCarthy	94 Linden St Hyannis, Ma 02601
Michael Parlante	3163 old state Hwy Wellfleet 0266
Robert K. Gold	15 Forest Glen Rd Hyannis 026
Nancy Cahoon	122 Skaket Beach Rd Orleans
Dawn Mac Lud	30 Captain Chase Lane S. Yarmouth
Danielle Jeanloz	1409 MAIN ST CHATHAM M

Name	Address		
Patty Creighton	10 Homer Ave.	So. Yarmouth, MA	02664
Barbara Adams	289 Old Main St.	So. Yarmouth	02664
Chuck Adams	289 Old Main St.	S. Yarmouth	02664
Glenna Selden	321 Deer Meadow Lane	Chatham	02633
Art I Selden	321 Deer Meadow Lane	Chatham MA	02633
JACK CREIGHTON	10 HOMER AVE	SO. YARMOUTH, MA.	02664
Keith Ritchie	76 Pleasant St	So-yarmouth Mass	02664
KEN WHITING	313 BANK ST	HARWICH MA	02645
DONNA WHITING	313 BANK St.	HARWICH MA	02645
SHANNON GOHEEN	104 TELEGRAPH RD	DENNIS PORT, MA	02639
MARIANNE HARRIS	211 COUNTRYSIDE DR.	CHATHAM	02633
Mario Imbergamo	26 Andover Dr.	Chatham, Ma	02633
Bill Imbergamo	9611 Masterworks Dr.	VIENNA, VA	22181
Bob Putnam	19 Middle Rd	Chatham	

Stop Monster Tandem Net Trawlers from decimating all herring and other fish stocks

Recommend 15 Send Tweet



Target: The Monster Tandem Net Trawling Techique used by the Herring Industry
Sponsored by: Arthur Costonis

signatures: 146

signature goal: 1,000

500,000 lbs of sealife killed/tow (several per trip) unbalances ocean envioronment

"By- Catch" killed includes Dolphins, Cod, Striped Bass. Haddock, Tuna, Whales

Arthur, You signed on May 30,
Your signature has been delivere
The Monster Tandem Net Trawlin
Techique used by the Herring Inc



Alaska's Wildlife at I
signatures: 46,787
sign petition



Fight for the Future Reefs
signatures: 3,432
sign petition



Tell Power Plants to Up Their Act!
signatures: 87,524
sign petition

all petition categories | view mor

Micro fauna/flora. free floating fish eggs, spat also killed

Say yes to amendment 5 in Fishery Mangaement Plan

we signed "Stop Monster Tandem Net Trawlers from decimating all herring and other fish stocks"

# 146	16:08, Jun 03, Mrs. Janet Chase, OR
# 145	15:44, Jun 03, Ms. maria rosaria bruscia, Italy
# 144	13:56, Jun 03, Ms. Jenine Dransfield, United Kingdom
# 143	11:26, Jun 03, Mr. Andy Critchell, United Kingdom
# 142	09:29, Jun 03, Mr. Michael Allen, CA
# 141	09:19, Jun 03, Ms. Dawn Louise, United Kingdom
# 140	08:50, Jun 03, Mr. Giovanni Fioretti, Italy
# 139	07:16, Jun 03, Ms. Tanwi Sandelwood, Belgium
# 138	07:11, Jun 03, Mrs. Ela Gotkowska, Poland
# 137	05:53, Jun 03, Ms. Elsie Au, Thailand
# 136	05:14, Jun 03, Ms. Judith Abel, Switzerland
# 135	05:08, Jun 03, Dr. William Coleman, MA
# 134	03:02, Jun 03, Mrs. RANA AZZAM, Lebanon

# 133	01:35, Jun 03, Ms. Danuta Watola, Poland
# 132	01:07, Jun 03, Ms. Victoria Pohrebna, Ukraine
# 131	00:11, Jun 03, Mr. Richard Hollister, AZ
# 130	20:22, Jun 02, Mr. John Mark Robertson, ON
# 129	18:30, Jun 02, Maryann Staron, IL
# 128	10:07, Jun 02, Ms. Karen Connolly, FL When there are no more fish to eat, people are going to finally ask, "What happened?" Sadly, once there are no more fish, people will be eating more chic and beef. Go vegan - PLEASE!
# 127	10:04, Jun 02, Name not displayed, United Kingdom
# 126	09:45, Jun 02, Mrs. Ann Contreras, CA
# 125	09:25, Jun 02, Mr. Ed Laurson, CO
# 124	05:32, Jun 02, Ms. Reidun Carstens, Norway
# 123	01:26, Jun 02, Mrs. Gabriela Craciunas, Romania
# 122	00:41, Jun 02, Mrs. JAMIE IGOE, CA
# 121	16:49, Jun 01, Ms. Jo Wiest, LA
# 120	14:59, Jun 01, Mr. Anthony Blackley, Australia
# 119	11:35, Jun 01, Mr. alan scanner, United Kingdom
# 118	11:01, Jun 01, Ms. Mercedes Pok, Hungary
# 117	09:26, Jun 01, Ms. Katie Carlile, United Kingdom
# 116	07:48, Jun 01, Mrs. Janice Cowett, ME
# 115	06:59, Jun 01, Ms. Tara Belland, MI
# 114	06:01, Jun 01, Mr. DB Cooper, Japan
# 113	04:26, Jun 01, Mr. Terry King, CA
# 112	04:01, Jun 01, Mrs. Heike Rade, Germany
# 111	03:46, Jun 01, Ms. Liza Ruiz, MI
# 110	02:01, Jun 01, Mr. Ian Brown, United Kingdom
# 109	00:01, Jun 01, Ms. Kristin Weber, Germany
# 108	21:43, May 31, Mrs. Diana Molski, IL
# 107	20:46, May 31, Ms. Iona Kentwell, Australia
# 106	16:01, May 31, Mrs. Masha Samoilova, United Kingdom
# 105	15:41, May 31, Ms. Donna Varner-Sheaves, NC
# 104	15:23, May 31, Ms. silja salonen, ON
# 103	15:13, May 31, Ms. Jemma Browning, United Kingdom
# 102	14:55, May 31, Ms. Eva Fidjeland, Sweden
# 101	14:52, May 31, Ms. Helene Beck, Denmark

# 100	14:19, May 31, Dr. Vegan World Network, Australia
# 99	14:18, May 31, Dr. Wolfgang Zenker, ON
# 98	12:58, May 31, Mrs. Snezana Miletic, Serbia And Montenegro
# 97	11:07, May 31, Mr. Tim Cheung, BC
# 96	11:06, May 31, Name not displayed, Poland
# 95	11:04, May 31, Ms. Gabriela Voicila, Romania
# 94	11:01, May 31, Ms. Sylwia Dawidek, Poland
# 93	10:58, May 31, Mr. Alan Mason, United Kingdom Urgent control is required - this is over kill for human greed
# 92	10:56, May 31, Mrs. MariaLuisa Oliva de Corman, Spain
# 91	10:55, May 31, Ms. Barbara Panczyszyn, Poland
# 90	10:54, May 31, Ms. Faith Billingham, NM
# 89	10:34, May 31, Ms. TERESA ROZENGA, Poland
# 88	10:34, May 31, Dr. Elisabeth Bechmann, Austria
# 87	10:30, May 31, Mr. Jason Green, VA
# 86	10:25, May 31, Ms. Dorota Wisniewska, Poland
# 85	10:20, May 31, Ms. Sherebanu Kajee, South Africa
# 84	10:08, May 31, Mrs. Anneke Andries, Netherlands
# 83	09:59, May 31, Mr. Dan and Tina Partlow, TX
# 82	09:41, May 31, Mr. Shawn Williamson, CA
# 81	09:40, May 31, Name not displayed, PA
# 80	09:36, May 31, Patrizia Scally, TX
# 79	09:30, May 31, Mr. Ernie & Jennife MacAulay, NS
# 78	09:20, May 31, Mrs. Elisabeth Thompson, CA
# 77	09:18, May 31, Name not displayed, CA
# 76	08:55, May 31, Ms. Donna Coffey, KY
# 75	08:47, May 31, Mrs. Cathala Corine, France
# 74	08:45, May 31, Ms. Amy Angelo, OK
# 73	08:40, May 31, Ms. Carolyn Sheetz, IN
# 72	08:38, May 31, Mrs. Nicole Weber, MD
# 71	08:38, May 31, Mrs. Irma Fleischeuer, Netherlands
# 70	08:14, May 31, Mr. michael hall, IL
# 69	08:11, May 31, Name not displayed, Ireland
# 68	08:10, May 31, Name not displayed, Sweden
# 67	07:58, May 31, Mr. William Gowern, CA

# 66	07:49, May 31, Mr. Tyler Harrington, NY
# 65	07:49, May 31, Mrs. Patricia Cannell, MB
# 64	07:45, May 31, Ms. Beth Wilkerson, KY
# 63	07:43, May 31, Mr. Roger Monk, United Kingdom
# 62	07:41, May 31, Ms. Pam Fillion, CA
# 61	07:02, May 31, Name not displayed, Mexico
# 60	07:01, May 31, Mr. Bill Kessler, IL
# 59	06:41, May 31, Mrs. Mary Ann Merville, PA
# 58	06:37, May 31, Mrs. Liza Fedorovich, Russian Federation
# 57	06:32, May 31, Mr. David Moore, CT
# 56	05:41, May 31, Mrs. Miriam Carneiro Saraiva, Brazil
# 55	05:10, May 31, Mr. Joe Renneke, MN
# 54	05:08, May 31, Mrs. Joan Quigg, NB
# 53	05:01, May 31, Ms. Bettina Lorenz, Germany
# 52	04:54, May 31, Ms. DENA HARRIS, GA
# 51	04:51, May 31, Ms. Donna Hamilton, United Kingdom

See more petitions:
Environment and Wildlife

about us advertise partnerships careers press contact us terms of service privacy subscription center help

COPYRIGHT © 2012 CARE2.COM, INC. AND ITS LICENSORS. ALL RIGHTS RESERVED

Congress of the United States
House of Representatives
Washington, DC 20515

June 8, 2012

The Honorable Samuel D. Rauch III
Acting Assistant Administrator
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 2091

Dear Acting Assistant Administrator Rauch:

As Members of Congress concerned with the dwindling river herring and shad populations in Long Island Sound and other rivers and tributaries across the Northeast Atlantic seaboard, we request that the National Marine Fisheries Service (NMFS) ensures that robust, coast-wide, science-based conservation and management measures to protect river herring and shad are included in implementing Amendment 5 to the Atlantic Herring Fishery Management Plan (FMP) and Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish FMP. The New England Fishery Management Council and Mid Atlantic Fishery Management Council initiated these amendments in significant part to address the incidental, or bycatch of river herring and shad by the industrial Atlantic herring and mackerel fleets. The survival of these species has a direct impact on our local economies, ecosystems and other species and local fishermen in our Congressional Districts.

The Northeast Atlantic seaboard includes some of our most treasured historic and ecologically-sensitive coastal enclaves, including Long Island Sound, the Hudson River, Delaware Bay and Chesapeake Bay. These remarkable rivers and coastal waterways once supported prolific runs of river herring and shad, but in recent decades the numbers of fish returning to rivers each year has dramatically declined. This problem is particularly glaring in Long Island Sound and Connecticut as the Connecticut Department of Energy and Environmental Protection recently reported that the number of river herring returning to Connecticut rivers has dropped from millions each year to less than 500,000. River herring and American shad are key forage fish that play a vital role not only as prey for the Long Island Sound's game fish, striped bass and bluefish, but also a wide array of coastal birds and other wildlife living across the Northeast Atlantic seaboard. Despite concerted federal, state and local investments to restore these forage species, their populations are at troubling lows and their scarcity undermines the health of our ocean and our coastal economies.

In federal waters, the incidental catch of river herring and shad remains a serious concern and impedes forage fish recovery. Millions of river herring and shad are caught every year by industrial trawlers operating in federal waters. We urge NMFS to ensure that the regulations implementing Amendment 5 and Amendment 14 of the Atlantic Herring and Mackerel, Squid and Butterfish FMPs respectively include consistent and robust management measures that protect river herring and shad throughout their range in federal waters, including an annual cap,

or limit, on river herring and shad catch in the Atlantic herring and mackerel fisheries and 100 percent monitoring of industrial trawlers, in order to limit fishing mortality and to provide reliable estimates of all catch of depleted river herring and shad.

Sincerely,

ROSA L. DeLAURO
Member of Congress

STEVE ISRAEL
Member of Congress

NITA LOWEY
Member of Congress

GARY ACKERMAN
Member of Congress

CHARLES RANGEL
Member of Congress

JAMES MORAN
Member of Congress

JAMES HIMES
Member of Congress

JOE COURTNEY
Member of Congress

JOHN LARSON
Member of Congress

JOSE SERRANO
Member of Congress

CAROLYN MALONEY
Member of Congress

MAURICE HINCHEY
Member of Congress

JERROLD NADLER
Member of Congress

ELIOT ENGEL
Member of Congress

CHAKA FATTAH
Member of Congress

JAMES LANGEVIN
Member of Congress

CHRIS VAN HOLLEN
Member of Congress

CAROLYN McCARTHY
Member of Congress

CHRIS MURPHY
Member of Congress

BOBBY SCOTT
Member of Congress

DAVID CICILLINE
Member of Congress

PAUL TONKO
Member of Congress

JOHN P. SARBANES
Member of Congress

GERRY E. CONNOLLY
Member of Congress

EDWARD J. MARKEY
Member of Congress

Cc:
Rip Cunningham, NEFMC Chairman
Richard Robins, MAFMC Chairman
Paul J. Diodati, ASMFC Chairman

From: Peter Baker [mailto:PBaker@pewtrusts.org]
Sent: Monday, June 11, 2012 2:58 PM
To: samuel.rauch@noaa.gov; Dan Morris
Cc: Lori Steele; jdidden@mafmc.org; Paul Howard; Chris Moore; Carrie Nordeen; Aja.Szymulo@noaa.gov; George Darcy
Subject: Herring Alliance email re: NERO Letters on Am14 & Am 5

Dear Acting Administrator Rauch and Acting Regional Administrator Morris,

We are writing in response to the June 5, 2012 NERO letters to the MAFMC and NEFMC regarding Amendment 14 to the MSB FMP and Amendment 5 to the Atlantic herring FMP. We, along with many of our partners, have spoken to you on several occasions about the need for Agency leadership regarding the critical decisions in these two actions, and their impacts on the East Coast's forage fish populations. Therefore **we are disappointed in these 11th hour communications to the two Councils, which on many issues read as if NERO is a new participant in the development of the actions and has never seen the DEIS documents until now.** NERO in fact has been involved for nearly 5 years and approved the two DEIS's just a few short months ago. Your letters suggest a lack of understanding of the hard work done over the past 5 years by the two Councils, by many stakeholders in the fishery, and even by NERO staff. **We find many of the statements in these letters to be contradictory to a plain reading of the Amendments, the law, and in direct violation of a recent court ruling, *Flaherty v. Bryson*.** In that light, the letters seem counterproductive on some important issues.

We are encouraged by NERO's support for river herring catch caps in both FMP's, and appreciate this guidance to the Councils. Nevertheless, **we are also disappointed that your comments on river herring protection fall far short of NERO's obligations to conserve and manage these species** in several other critical ways.

Regarding Amendment 14, it is unfortunate that NERO continues to act in a manner that ignores the severely depleted status of river herrings and shads, particularly in view of the ruling in *Flaherty v. Bryson* which clearly lays out the Service's requirements regarding what stocks must be included in a fishery management plan. **We are strongly opposed to any further delay in taking action to bring river herring and shad under the MSB FMP.** Unfortunately, this letter may very well result in such a delay.

NERO's apparent interpretation of Alternative Set 9 in Amendment 14 is simply incorrect. The letter appears to interpret Alternative Set 9 as intending to only initiate council action to consider adding river herrings and shads to the MSB FMP in a future action. However, the plain language of the alternative set clearly states that if selected these stocks would be added now. Alternatives 9(b)-(e) state "Add [one or more river herrings and shads] as a stock in the MSB FMP" (*See* Amendment 14 DEIS at p.194). Alternative Set 9 would also immediately initiate an amendment to develop management measures required under the MSA, likely to be completed in one to two years.

Contrary to NERO's letter, there is indeed a federal action contemplated in this alternative: designating RH/S as non-target stocks within the MSB FMP, now. The Council is also acting in accordance with the law. As stated in *Flaherty* "Councils must make two determinations: (1) which stocks can be treated as a unit for purposes of management, and therefore should be considered a fishery, and (2) which of these fisheries then require conservation and management. The Council must *then* set ACLS and AMs [and other required management measures] for all stocks in the fishery." *See* Flaherty v. Bryson, 2012 WL 752323 at*9. (emphasis added). This is consistent with structure of the Act, which lists as the first Council function under section 302(h)(1) the decision to "prepare" an FMP or amendment for each stock in need of conservation and management, and then lists under section 303 the required provisions of such

plans. **It is a baffling and inconsistent reading of the plain language and structure of the MSA to suggest that councils must first prepare all of the required elements of a plan for a stock of fish, and *then* determine whether or not the stock should be added to the plan. This would also be a highly inefficient use of Agency and Council resources. No Court would support this interpretation.** As previously mentioned, it is also a baffling and inconsistent reading of the plain language in Amendment 14 which states that the decision on whether to add the RH/S stocks is to be made upon final Amendment 14 action. That is, now not later.

Finally, **that NERO should provide this interpretation of the Alternative Set 9 only at this late juncture is also unacceptable. The Service has participated in Council deliberations on Amendment 14 for nearly two years during which time it could have voiced concerns regarding the language under the 'stocks in the fishery' alternative, and only two months ago approved the DEIS for public comment. That NERO should also wait until after the close of the public comment to release these questionable criticisms is unacceptable and has effectively denied the public the opportunity to comment on this concern.** To effectively tell the Council to pull this alternative, as written, out of the Amendment is an affront to the public processes assured by NEPA and the Administrative Procedure Act, and will result in an unacceptable delay in the critical decision about adding RH/S to the MSB FMP that is already two years in the making. The law does not allow managers to unreasonably delay the decision-making regarding the appropriate composition of a fishery given their statutory obligations to ensure that overfishing does not occur. *See* Flaherty v. Bryson, 2012 WL 752323 *12.

We encourage the Service to carefully read the Amendment 14 comments submitted by Earthjustice on behalf of the Herring Alliance (attached to this email), prior to the Mid Atlantic Council meeting tomorrow. **We request that the Service clarify for the Council prior to its decisions on Alternative Set 9 that they can indeed make a decision to add river and shad as stocks in the fishery now, and initiate a subsequent amendment to consider alternatives for management measures that will fully integrate RH/S into the plan.** Failure to do so leaves the Council and NMFS vulnerable to suit for delaying action to add river and shad to the MSB FMP.

With regard to Amendment 5, as previously mentioned, we are pleased to see that NERO has expressed support for establishing RH/S catch caps in both Amendments but must point out that NERO has missed an opportunity to lead on this issue more effectively by failing to recommend that the NEFMC implement a RH/S catch cap immediately, rather than through a subsequent framework action. In its two letters to the Councils, NERO itself points out that for catch caps to function effectively, joint caps are necessary. Yet NERO goes on to support immediate cap implementation in the MSB fishery, and fails to call upon the NEFMC to modify its Alternative 3.3.5 to require an immediate cap. NERO should not support the indefinite postponement of RH/S conservation and management that is contemplated in its preferred Amendment 5 alternatives as expressed in this letter. In fact, **we are perplexed and disappointed that NERO has not recognized that the Herring FMP already contains the authority to implement a catch/bycatch cap through either a framework adjustment or annual specifications (this authority was implemented through Amendment 1 to the Herring FMP in 2007), and that therefore Alternative 3.3.5 as written is meaningless. Moreover, NMFS as completely ignored the question of adding RH/S as stocks in the Atlantic herring fishery, despite the opinion in Flaherty v. Bryson. This is irresponsible in view of the severely depleted condition of these stocks, and will continue to leave the fishery out of compliance with the law.**

Beyond these critical misunderstandings and questionable recommendations on river herring conservation and management, **both letters also contain disappointing, inaccurate and counterproductive statements on many other important monitoring and bycatch reduction provisions** in both amendments:

- **NERO has demonstrated a misunderstanding of the slippage measures in both amendments** that would provide a fleet-wide allowance of dumping events, after which any subsequent dumping would require trip termination. In implying that **before** the allowance is reached there may be **insufficient** controls on dumping, and that **after** the allowance is reached trip termination may be **too severe** a response, NERO misses the point that the two are **integrated parts** of a carefully blended approach. This two-phase dumping accountability approach is in fact a compromise designed to address NERO's very concerns about balancing effectiveness and legality. The allowance provides a buffer before trip termination requirements kick in. In fact, it is likely to change behavior, reduce dumping, and prevent trip termination from occurring. In addition:

    - **The dumping event allowance numbers proposed in the DEIS (Amendment 5 and 14) are not arbitrary**. The Amendment 5 DEIS presents compelling evidence (based on past dumping data and the likelihood that these measures will drive changes in behavior that dramatically reduce the number of events) that the proposed allowances actually make sense and are likely a very solid starting point for numbers that will ensure trip termination rarely rears its head. *See* Amendment 5 DEIS, at p. 433.

    - **NERO's statements that it is "concerned about the legal justification" of the slippage measures is inconsistent with NERO's own past statements about the need to properly sample dumped discards**, for instance as contained in the Final Rule implementing new slippage controls for Georges Bank Closed Area I. 75 Fed. Reg. 73979 (Nov. 30, 2010). This Final Rule contains important acknowledgements that observers simply cannot properly document catch that is not brought aboard, and that this catch is critical due to pre-sorting issues. This Final Rule also establishes the feasibility of bringing the catch aboard as further demonstration of the practicability of these measures

    - **Most of these problems are symptomatic of the fact that NERO has failed to consider, acknowledge, or even explore the success to date of the Closed Area I pilot program.** Two years in , this program, upon which the measures NERO criticizes are closely based, has succeeded in driving dumping levels to near zero, with no reported safety, operational, or practicability problems. NERO's statements that it is "concerned about effectiveness" reflect a failure to examine this model which has been proven effective.

- In addition, **we fundamentally disagree that the slippage measures place observers into any kind of enforcement role.** These measures are again carefully constructed, and based closely on successful pilot efforts in CAI, to avoid that issue. **If simply having observers record their observations is considered by NERO to be placing them in an enforcement role, we would submit that any time they record a catch in excess of a trip limit or measure a piece of gear that fails to meet regulations also places them in an enforcement role.** The eventual conclusion of this exercise is clearly absurd. We would also point out that the NEFMC Enforcement Committee has explored this issue, submitted recommendations to the NEFMC which were incorporated into Amendment 5, and expressed satisfaction at the results. Furthermore, at a recent meeting of that Committee, NEFMC staff reassured the Committee that as constructed, the slippage measures did not in fact place observers in an enforcement role.

- **NERO demonstrates a misunderstanding of the status quo on catch weighing**. Appendix I to the AMENDMENT 5 DEIS states it quite simply when it says "herring are not often weighed." The June 5 letter from NERO to the two Councils actually captures the core of the problem with current practice in the fisheries well, stating that "we use the weights provided by the dealers, regardless of the methods used to determine weights." This is exactly the problem that the weighing alternatives in the two amendments are supposed to solve. The two letters also state that "we are unable to evaluate, either annually or for individual transactions, the sufficiency of the [landed weight] information submitted." Again, this describes a woefully inadequate status quo, and **we cannot understand much less accept NERO's casual dismissal of the problems and the real solutions presented in the DEIS's.**

- **We are disappointed, especially in light of the clearly inadequate monitoring regime in these fisheries, that NMFS does not express support for industry funded observer coverage as contemplated by the two Councils. NMFS has previously urged the Councils to make sure that industry-funded options were included in both amendments, and claims in these letters that it "supports improvements to fishery dependent data collections" including "through expansion of monitoring at sea." We cannot reconcile this inconsistency.**

- **The NERO letter to the NEFMC is dismissive of proposed measures to rescind access to year-round Groundfish Closed Areas for midwater trawl vessels, and to require them to apply for and receive an Exempted Fishing Permit (EFP) in order to regain access to these areas for experimental fishing.** The letter cites analyses in the DEIS which indicate that midwater trawl vessels are not catching significant amounts of groundfish inside the closed areas. This position completely ignores the critical role of the closed areas in groundfish rebuilding and even more egregiously ignores information in the Amendment 5 DEIS plainly showing that groundfish bycatch rates are higher inside the closed areas. *See* Amendment 5 DEIS at p. 490.

We request that you carefully consider these comments on the positions presented in your letter as you formulate Agency guidance and recommendations to the Councils next week, and before voting. We also request you carefully review our public comment letters on both Amendments, which outline important additional rebuttals to several of the positions in your letters that are ill-advised in our view. The Councils and many stakeholders including the 50+ member groups of the Herring Alliance have been working hard on comprehensive and responsible reforms to the these two FMP's to better monitor and reduce bycatch of all species including severely depleted river herrings and shads. **NMFS comments do not sufficiently acknowledge these efforts, nor do they reflect the overwhelming public support and clear legal basis for many of the measures.**

I have attached Herring Alliance comments on both Amendments 5 & 14 for your review.

Thank you,

Peter Baker, Director
Herring Alliance
www.herringalliance.org

CC: Lori Steele; Jason Didden; Paul Howard; Chris Moore; Carrie Nordeen; Aja Szymulo; George Darcy

From: Gary Libby
Sent: Tuesday, June 12, 2012 8:04 AM
To: Rip Cunningham; Paul Howard
Subject: herring amendment 5

I would like to support the committee motion on groundfish closed areas for alternative 4,option 4a for 100% observer coverage. I still have some concern about spawn groundfish in closed areas, I think there should be a definition of what mid-water is meaning how close to bottom the net can be towed. I worry about changing spawning activity in groundfish closed areas. I
I'm also concerned about the river herring measures,I think a catch cap for river herring is something that should be considered,and a in shore buffer zone during times of the year when river herring is highest.
The catch monitoring,I think that including the category C vessels isn't necessary because they only land about 2% of the total catch paying for at sea monitoring wouldn't be cost effective for the C vessels.This is maybe where the use of 100% dockside monitoring would be better .I'm in favor of at sea catch monitoring for the A&B category vessels because they catch about 98% of the catch,I also think the vessels that piers seine should be considered a different category than trawl vessels because their by-catch composition is different.
Most of my suggestions are probably going the used in a framework if at all but I you will considered them as good alternatives

--
Captain Gary Libby
Never stop fighting till the fight is done.
Live long, live strong, eat seafood.

From: Jake Kritzer
Sent: Wednesday, June 13, 2012 7:18 PM
To: Paul Howard; Lori Steele
Subject: Herring A5 submission

Dear Paul and Lori,

Adrian Jordaan of Stony Brook University and I have been collaborating on a study of environmental impacts on river herring populations. Among the variables we included in the multivariate regression analysis were Atlantic herring landings as a proxy for bycatch impacts. As the Council deliberates Amendment 5, we felt these results might be useful and wanted to communicate them, even though the final analysis and report are not yet complete. Lori advised that comments submitted at least three days before the Council meetings begin can still be considered.

Best,
Jake

Capt. Paul Howard, Executive Director
and
Ms. Lori Steele, Herring Plan Coordinator
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

June 13, 2012

Dear Paul and Lori,

We are nearing completion of a multivariate analysis that is looking for environmental correlates of river herring population trends in a series of watersheds along the U.S. Atlantic coast. The study is being prepared for publication, and the results related to river flow, drought, oceanography, and other climate-related variables will be summarized and communicated to the National Marine Fisheries Service as it evaluates climate effects on river herring as part of its ESA status review.

Our study also included data on Atlantic herring landings as a possible explanatory variable, data that in our estimation serve as a proxy for bycatch impacts. As NEFMC considers measures to reduce bycatch of river herring in the Atlantic herring fishery as part of Amendment 5 to the herring FMP, we wanted to share our working results for that component of the analysis with the Council. Therefore, appended to this letter is a brief summary report.

As other components of the study are completed, including the climate-related outcomes and finally the full analysis, we will forward those reports to the Council as well. In the meantime, please do not hesitate to contact us with any questions or comments on our work.

Best of luck as the Council confronts these important management issues.

Sincerely,

Adrian Jordaan, Ph.D.
Quantitative Ecologist
School of Marine and Atmospheric Sciences
Stony Brook University
Stony Brook, NY
Adrian.Jordaan@sunysb.edu

Jake Kritzer, Ph.D.
Director of Spatial Initiatives
Oceans Program
Environmental Defense Fund
Boston, MA
jkritzer@edf.org

Correlations between Atlantic herring landings and river herring abundance

Adrian Jordaan[1] and Jacob P. Kritzer [2]

[1]School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY, 11794

[2]Environmental Defense Fund, 18 Tremont Street, Suite 850, Boston, MA 02108

Introduction

As part of a study of oceanographic, watershed and anthropogenic drivers of river herring abundance, we examined correlations between landings of Atlantic herring and trends in a series of river herring populations along the eastern seaboard. The larger study considers a range of possible explanatory variables, and aims to develop hypotheses about the relative magnitude of different factors, and which are consistent among multiple rivers or unique to one or few. Our full analysis is nearing completion, and is being prepared for publication. Here, we summarize and discuss working results for correlations between Atlantic herring landings and river herring abundance in our focal rivers to inform the New England Fishery Management Council as it considers measures to address river herring bycatch.

Methods

Time series data on river herring abundance for 21 rivers spanning five states were used in the analysis (Table 1). The length of each river herring population time series varied from 4 to 40 years. Abundance trends for most rivers were estimated by electronic or visual counts at fish ladders. Exceptions include the Connecticut River, for which estimates are based on the number of fish lifted at the Holyoke Dam, and the Chowan River, for which estimates are derived from the 2005 stock assessment conducted by the North Carolina Division of Marine Fisheries. Most data sets combine alewives and blueback herring into a single "river herring" count, as the species are difficult to distinguish visually. However, species-specific data were available for the Monument River due to biological sub-sampling by the Massachusetts Division of Marine Fisheries that enabled estimation of species composition. Also, North Carolina's 2005 stock assessment produced separate estimates for the two species. More information on most of the population time series utilized can be found in the Atlantic States Marine Fisheries Commission's recent river herring stock assessment report (ASMFC 2012), with additional information on the Rhode Island runs provided by Edwards (2011). The Merrimack River was not included in the Stock Status Report, but data were available from the U.S. Fish and Wildlife Service[1].

The full analysis (in progress) includes 41 potential explanatory variables spanning the watershed and ocean environments, and including attributes that are both natural and anthropogenic in nature. Some variables are unique to individual river systems, such as flow patterns. Others are used for a sub-set of rivers, such as state-specific drought indices. Still others were used in the analysis for all population time series, including Atlantic herring landings from the most recent stock assessment by the Transboundary Resource Assessment Committee (Shepherd et al. 2009). This summary report focuses on the results for correlations with Atlantic herring landings.

---

[1] http://www.fws.gov/northeast/cnefro/returns.html

All time series were normalized (Z-transformed) or standardized prior to analysis to eliminate scale effects during comparisons, including river counts (n=22 time series from 20 rivers; Table 1) and environmental variables. Multiple regressions were run to identify significant correlates with each population time series. Forward selection stepwise regression has no initial predictors, and instead predictors are evaluated using increases in r^2 achieved by adding each to the model. The predictor that provides the largest increase is added first, as long as the predictor contributes to an overall significant regression model. Once no predictors satisfy these constraints the analysis stops.

Results and discussion

The results of the analysis are summarized in Table 1. The majority of significant results were for Atlantic herring landings from the Gulf of Maine, with half of the 22 river herring population trends significantly correlated with that variable. Of those significant correlations, four were positive and seven were negative. Although we focus only on results for correlations with Atlantic herring landings in this summary report, no other range-wide variable showed as many significant results as Atlantic herring landings from the Gulf of Maine.

Correlation does not necessarily equate to causation, and significant relationships might reflect similar responses to some other factor when positive or opposite responses to a common factor when negative. Where correlations with Atlantic herring landings do reflect some sort of ecological linkage, Atlantic herring landings might be a proxy for an impact upon river herring (i.e., bycatch mortality), but landings might also be a proxy for Atlantic herring abundance (although biomass estimates from the Atlantic herring stock assessment would be a much more direct measure). If Atlantic herring landings alias abundance, positive relationships might represent common responses to ocean temperatures, plankton abundance, predator abundance, or some other factor, given the similarities in oceanic ecology of the species. Those ecological similarities make it less likely that negative relationships reflect independent responses to the same causal factor, with the possible exception of hypotheses related to competition.

Alternatively, correlations might reflect coincidental responses of Atlantic and river herring to completely unrelated causal factors. Atlantic herring landings reached extremely low levels in the early 1980s, before climbing again through the mid-1990s. Several of the river herring time series begin around the same time, typically due to initiation of monitoring following fish passage projects. The Merrimack River population was extensively stocked during the 1980s and 1990s, and trends in that system are most likely driven more by the supplemental spawners than any other factor. Therefore, river herring runs rebuilding through active restoration at the same time as recovery of the Atlantic herring stock following overfishing would show a positive correlation that does not reflect any linked ecological responses. A next step for our study is to test this hypothesis by running the analysis beginning 5-7 years into each river herring time series to eliminate effects of initial stock growth from very low levels.

Atlantic herring landings perhaps more likely represent an impact on river herring, in which case negative correlations would indicate significant bycatch impacts. There is some geographic pattern in the results, particularly the absence of significant relationships for the northernmost rivers in Maine. River herring are known to migrate into Canadian waters, including the Bay of Fundy and Scotian Shelf, during their ocean phase. Although migratory patterns specific to individual rivers or states are unknown, if river

herring from rivers further north in the U.S. are more likely to move beyond U.S. waters, then those fish might have greater refuge from bycatch impacts in U.S. waters. Notably, river herring populations in Maine are generally faring better than populations elsewhere (ASMFC 2012).

At the other end of the range of the data, population trends in five of the seven southernmost rivers showed significant negative correlations with Atlantic herring catch in the Gulf of Maine. If fish from rivers in southern New England and further south do not migrate as far north during the ocean phase as river herring from rivers in the Gulf of Maine watershed, then those populations might be subject to greater bycatch impacts in U.S. waters. Our analysis does contain a sizable gap in geographic coverage between Connecticut and North Carolina due to the lack of time series of river herring counts within that region. We are therefore unable to describe patterns through the Mid-Atlantic region.

An emerging hypothesis is that river herring experience the greatest bycatch impacts in waters just north of their natal river. If true, that would suggest the general absence of significant correlations with Atlantic herring landings from Southern New England and George's Bank is due to fish from our study rivers largely migrating north of those waters. On the other hand, fish from the South Atlantic and Mid-Atlantic rivers that are largely absent from our analysis might be more affected by bycatch off Southern New England and/or George's Bank.

This study provides the first quantitative evidence that bycatch in the Atlantic herring fishery might be a significant driver of river herring abundance. As a correlation analysis, the results should be used to develop, compare the likelihood among, and ultimately test competing hypotheses. A key component of testing certain hypotheses will be better mapping the oceanic migrations of river herring from different rivers, an objective being met by a series of coordinated genetic studies along the coast. Hypotheses can also be developed and evaluated by other analyses, and our final paper will report the full results of the multiple regression analysis, including other environmental variables, as well as insights from other multivariate statistical techniques applied.

Acknowledgements
This study was conducted through funding from the National Fish and Wildlife Foundation and the Gordon and Betty Moore Foundation. The preliminary report benefited from comments by and discussion with Gary Nelson, Wilson Laney, Karin Limburg, John Waldman, Jamie Cournane and Doug Rader. However, the content remains the sole responsibility of the authors.

References

Atlantic States Marine Fisheries Commission. 2012. Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review. Stock Assessment Report No. 12-02, Arlington, VA.

Edwards, P. 2011. Marine Sport Fishery Investigations: Restoration & Establishment of Sea Run Fisheries, American Shad & River Herring Restoration & Enhancement. Progress Report for F-26-R, USFWS Sportfish Restoration. Rhode Island Department of Environmental Management. West Kingston, RI.

Shepherd, G., M. Cieri, M. Power, and W. Overholtz. 2009. Gulf of Maine/Georges Bank Atlantic Herring Stock Assessment Update. Transboundary Resources Assessment Committee Reference Document 2009/04.

Table 1. Results of forward selection stepwise multiple regression analysis of the relationship between catch of Atlantic herring in major management units and abundance of river herring in selected rivers along the Atlantic coast. Rivers are listed from north to south. Elements of the table indicate the *p* value and direction of significant relationships. Blank cells represent results that were not significant at least at the 0.05 level or higher.

River	State	Time series	Southern New England	George's Bank	Gulf of Maine
Saint Croix River	ME	1981-1994			
Union River	ME	1982-2007			
Damariscotta River	ME	1977-2007			
Androscoggin River	ME	1983-2008			
Saco River	ME	1993-2007			
Cocheco River	NH	1976-2007			
Oyster River	NH	1976-2007			(+) 0.05
Lamprey River	NH	1972-2007			(-) 0.001
Exeter River	NH	1975-2007			(+) 0.05
Winnicut River	NH	1977-1991; 1998-2007			
Taylor River	NH	1976-2007		(-) 0.05	(-) 0.001
Merrimack River	MA	1983-2009			(+) 0.05
Parker River	MA	1972-1978; 2000-2007			
Monument River – Alewife	MA	1980-2007			(+) 0.001
Monument River – Blueback	MA	1980-2007			
Mattapoisett River	MA	1988-2007			(-) 0.05
Nonquit River	RI	1999-2007			
Buckeye River	RI	2003-2007			
Gilbert-Stuart River	RI	1981-2007	(+) 0.001		(-) 0.05
Connecticut River	CT	1966-2007			(-) 0.01
Chowan River – Alewife	NC	1972-2003			(-) 0.01
Chowan River – Blueback	NC	1972-2003			(-) 0.05

RECEIVED
JUN 14 2012
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

June 12, 2012

Governor Dannel P. Malloy
State Capitol
210 Capitol Avenue
Hartford, CT 06106

Dear Governor Malloy:

The undersigned organizations – representing a broad range of conservation groups, watershed associations, anglers, and recreational enthusiasts working to protect and restore Long Island Sound and its tributaries – urge you to request that Connecticut's representatives at the New England Fishery Management Council (NEFMC) adopt the strongest possible protections for river herring in the Atlantic herring fishery.

Long Island Sound's rivers and waterways once supported prolific runs of alewife and blueback herring, but in recent decades the number of fish returning to rivers each year has dramatically declined, to the point that they are now being considered for listing under the Endangered Species Act.[1] According to the Connecticut DEEP, millions of river herring once returned annually to Connecticut, but environmental officials say that by 2006, only 21 passed the Holyoke Dam on the Connecticut River[2]. According to the Long Island Sound National Estuary Program, herring populations have declined precipitously in all Long Island Sound rivers over the past few decades.[3] Today, their numbers have dwindled to the point that monitoring this spring (between March and May 1, 2012) at 13 coastal rivers, generally considered to be the State's most productive herring river runs, recorded a total number of alewife and blueback herring of less than 500,000.[4]

River herring – both alewife and blueback herring – are a keystone species to the food web of the Sound. Not only are they critical forage food for our major Sound game fish – striped bass and blue fish – but a wide array of coastal birds and other wildlife feed on a combination of adult or young herring.

For these reasons, our organizations, in collaboration with the Connecticut Department of Energy and Environmental Protection and the New York Department of Environmental Conservation, have worked diligently to open rivers and streams that feed into the Sound, with substantial success. This public-private partnership has already opened up more than 150 miles of valuable freshwater spawning habitat that was previously blocked by dams. In addition, we continue to support the State of New York's exploration, and State of Connecticut's continued renewal of a moratorium on river herring harvest in the Sound. While we do everything we can to open up more breeding habitat and conserve herring in our coastal areas, this alone is not enough. We know our herring spend most of their adult life in the

[1] NOAA Release, November 1, 2011, announcing consideration of listing river herring under ESA
[2] CT DEEP Press Release of April 3, 2012, announcing continuation of ban on river herring harvest.
[3] Long Island Sound Study, *Sound Update*, May/June 2009
[4] CT DEEP, Weekly Diadromous Fish Report, May 1, 2012

We appreciate your consideration of our concerns and thank you for your continued leadership and commitment to the sustainable management and conservation of our State's natural resources.

Sincerely,

Curt Johnson
Program Director
Save the Sound, a program of Connecticut Fund for the Environment
New Haven, CT

Margaret Miner
Executive Director
Rivers Alliance of CT
Litchfield, CT

Andrienne Esposito
Executive Director
Citizens Campaign for the Environment
New York & Connecticut

Sandy Breslin
Director of Governmental Affairs
Audubon Connecticut
Greenwich, CT

Albert E. Caccese
Executive Director
Audubon New York
Albany, NY

Robert Crook
Executive Director
Coalition of Connecticut Sportsmen
Hartford, CT

Carol DiPaolo
Executive Director
Coalition to Save Hempstead Harbor
Sea Cliff, NY

John Rumpler
Environment Connecticut
West Hartford, CT

Eileen Fielding
Executive Director
Farmington River Watershed Association
Simsbury, CT

Mary V. Rickel Pelletier
Executive Director
Park Watershed
Hartford, CT

Patricia Aitken
Executive Director
Friends of Oyster Bay
Oyster Bay, NY

Lynn Werner
Executive Director
Housatonic Valley Association
Cornwall Bridge, CT

Jennifer E. Herring
President and CEO
The Maritime Aquarium
Norwalk, CT

Jack Stoecker
President
Mianus River Watershed Council
Greenwich, CT

Hugh Rawson
Member and Past Chairman
Roxbury Conservation Commission
Roxbury, CT

Daniel Snyder, Ph.D.
Shoreline Shellfish, LLC &
Sound Marine Skills, Inc.
Branford, CT

Tim Visel
Coordinator
The Sound School
New Haven, CT

Ted L. Gardziel
Member and Past President
Trout Unlimited Hammonasset Chapter
Guilford, CT

Don Watson
Trumbull Conservation Commission
Trumbull, CT

Steve Gangi
Wetlands Commissioner, Town of Branford
Branford, CT

Gaboury Benoit
Professor
Yale School of Forestry and the Environment
New Haven, CT

CC:

Commissioner Daniel C. Etsy, Connecticut DEEP
Director David G. Simpson, Marine Fisheries Division, Connecticut DEEP
Mark Alexander, Supervising Fisheries Biologist, Connecticut DEEP
Executive Director, Paul J. Howard, New England Fishery Management Council

June 10, 2012

James B. Vaill
109 Carpenter Road
Monson, MA 01057

Ms. Carrie Nordeen
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: Herring Amendment 5 DEIS

Dear Carrie,

I am writing today to offer my comments on the Draft Environmental Impact Statement (DEIS) for Herring Amendment 5.

As a fisherman, I am greatly impacted by the management of the herring fishery. I have seen firsthand the negative impacts created by the large midwater trawlers for myself and everyone else in the region. For too long these boats have been able to fish with rules that are totally inadequate given the size and fishing power of the fleet. The Council must ensure that these problems are finally addressed when decisions are made for Amendment 5.

At minimum, the following actions should be approved:

- 100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life (Section 3.2.1.2 Alternative 2).

- Closed Area I (CAI) provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in the fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring. (Section 3.2.3.4 Alternative 4C)

- Prohibit herring midwater trawl vessels from fishing in Groundfish Closed Areas. These boats should have never been allowed in to begin with. (Section 3.4.4 Alternative 5)

- Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery. (Section 3.5.1 Option 2)

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Thanks for your time,

James B Vaill

James B. Vaill

RECEIVED
JUN 14 2012
By

Ocean River
INSTITUTE
Protecting the Commons

RECEIVED
JUN 15 2012
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

"All at last return to the sea—to Oceanus, the ocean river, like the ever-flowing stream of time, the beginning and the end."
— Rachel Carson, *The Sea Around Us*

June 13, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, Massachusetts 01950

Dear Mr. Howard,

We are concerned about the industrial Atlantic herring fishery and its damaging impact on coastal fisheries and wildlife, especially on our river herring. Most Atlantic states prohibit harvest and possession of river herring in state waters, and New Hampshire only allows limited fishing under an approved plan.

Industrial trawlers catch river herring without limit or regulation in ocean waters. A new river herring stock assessment confirms that river herring are depleted to near historic lows and bycatch is a threat to their recovery. Approximately 4 million river herring are killed incidentally each year, 70 percent of which is caught by large midwater trawlers.

This month the New England Fishery Management Council has an opportunity to close this loophole and protect river herring in federal waters. In advance of this crucial decision, please ask your Council representatives to hold these industrial trawlers accountable and promote river herring recovery by supporting:
1. Immediate implementation of a river herring catch cap to control the harvest of these critical forage species.
2. 100% at-sea monitoring on industrial trawl ships to provide accurate estimation of all catch, including catch of river herring.
3. An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area

Thank you for considering these comments and for your continued commitment to healthy coastal and marine environments.

Sincerely,

Rob Moir, Ph.D.
Executive Director

Along with 367 signers with comments

12 Eliot Street, Cambridge, MA 02138 • P.O. Box 380225, Cambridge, MA 02238
www.OceanRiver.org • tel 617-661-6647 • text ORI to 69866
Printed on 100% post-consumer recycled paper

Lynnda Strong
lynndastrong@gmail.com
2309 Halibut Point Road, #34
Sitka, AK 99835

Jonathan Mitchell
throwaways@yahoo.com
109 Cove Pointe Way
Madison, AL 35757

Tiffany Hutchins
queentk2530@yahoo.com
45685 Hwy. 72
Stevenson, AL 35772

Joyce Bowlin
joycebowlin@hotmail.com
807 W South
Harrisburg, AR 72432

Susan Navidad
sanavid66@yahoo.com
1818 N Taylor St #347
Little Rock, AR 72207

No matter what state or country, we need to protect our fish and our waterways. If we don't, we will have no food. No food for our beautiful creatures living off the land and no food for humans that keep raping the land of its beauty and bounty. Please, sustainability is our goal.
Chris Bihler
cbnasti@cox.net
3852 E Acoma Drive
Phoenix, AZ 85032

Dianne Douglas
ddouglas@mainex1.asu.edu
2723 E Valencia Drive
Phoenix, AZ

Diane Kent
JDKent@aol.com
4123 E Blanche Dr
Phoenix, AZ 85032

The New England Fishery Management Council has an opportunity to close this loophole and protect river herring in federal waters. In advance of this crucial decision, please hold these industrial trawlers accountable and promote river herring recovery by supporting: 1. Immediate implementation of a river herring catch cap to control the harvest of these critical forage species. 2. 100% at-sea monitoring on industrial trawl ships to provide accurate estimation of all catch, including catch of river herring. 3. An accountability system to discourage the wasteful slippage, or dumping, of catch, including a fleetwide limit of five slippage events for each herring management area
Alice Ali
lizjo3414@aol.com
8602 Whitton
Scottsdale, AZ

Marty Landa
marty@faceuptopeace.com
45 Siesta Lane
Sedona, AZ 86351

Mike Antone
troubadour7777777@yahoo.com
4307 N 358th Ave
Tonopah, AZ 85354

Nancy Feuerbacher
bassethounds@comcast.net
4531 N. Meadow Lane
Tucson, AZ 85749

Even though these fish are on the other side of our continent, they are vitally important to the fishing industry. AND, we DO buy fish here.
Karen Christian
kcaz1@cox.net
8435 Tumbling X Ranch
Vail, AZ 85641

Dave Anderson
dandersop51@sbcglobal.net
2735 Benvenue
Berkeley, CA

Mary Harte
melharte@yahoo.com
1180 Cragmont Ave
Berkeley, CA 94708

Melanie Andrus
mimiann.7782@verizon.net
313 Midori Ln
Calimesa, CA 92320

Jere Wilkerson

mrswilk@charter.net
1680 Linden Ct.
Cambria, CA 93428-5327

John Teevan
jptrugger@cox.net
1136 Misty Creek St
Chula Vista, CA 91913

Douglas McCormick
mfiinsure@cox.net
23602 Via Paloma
Coto, CA 92679

Kristina Fukuda-Schmid
kmfukuda@yahoo.com
11250 Garfield Ave.
Culver City, CA 90230

Josephine Polifroni
jpolifroni@earthlink.net
149 Midland Way
Danville, CA 94526

Donna Carr, M.D.
DonnaCarrMD@aol.com
1201 Sidonia St.
Encinitas, CA 92024

Overfishing is not good
John Pasqua
killself5150@yahoo.com
843 S Escondido Blvd
Escondido, CA 92025-4018

Geraldine Card-Derr
geraldine_card1@clearwire.net
237 North D Street
Exeter, CA 93221

Candi Ausman
crausman@wildmail.com
4555 Thornton Ave Apt 62
Fremont, CA 94536

Mark Mazhnyy
masarisik_11_7@hotmail.com
7691 N. Erie Ave.
Fresno, CA 93722

Julie Brickell
Juliebrickell@sbcglobal.net
210 W. Union Ave., #13
Fullerton, CA 92832

Ann Garth
a_garth@earthlink.net
11 58th Place
Long Beach, CA 90803

Corey Benjamin
scoob8178@gmail.com
970 Menlo Ave, #17
Los Angeles, CA 90006

Marine biodiversity is critically important. Responsible stewardship of our oceans and natural resources is a definitive issue for me as a voter. I encourage you to protect our waters and support fishing caps, and accountability with regards to fishing and pollution.
Cynthia Cleese
cyncsol@gmail.com
12008 Saltair Place
Los Angeles, CA 90049

Francois de la Giroday
mandf2@sbcglobal.net
4646 Los Feliz Blvd
Los Angeles, CA 90027

Michael W Evans
mikerain@earthlink.net
3731 S Sepulveda Blvd, Apt 1
Los Angeles, CA 90034-6888

We need to do all we can to be proper, ethical, moral, and smart stewards of this world and the living creatures that live in it. They in turn, provide life for all of us.
Andi Klein
andi.klein@tvbyfox.com
5700 Wilshire Blvd.
Los Angeles, CA 90036

Leslie Rabb
lrpm2@yahoo.com
637 Westbourne Dr
Los Angeles, CA 90069

Thomas Rummel
thomasrummel@hotmail.com
1340 N Poinsettia Pl, Suite 208
Los Angeles, CA

Babette Bruton
bbruton3@yahoo.com
15921 Linda Ave

Los Gatos, CA 95032

Rob Seltzer
rsscpa@earthlink.net
18408 Clifftop Way
Malibu, CA 90265

Gabriel Sheets
arkangyl-gabriel@comcast.net
1620 Shirley St
Merced, CA 95341

Iris Chynoweth
iris@sierratel.com
4954 Ponderosa Way
Midpines, CA 95345

Dean Monroe
dmdesmoines@yahoo.com
5301 Cleon #4
No. Hollywood, CA 91601-3356

Robert Ellis
zoidbergbot@gmail.com
1919 Market St
Oakland, CA 94607

Janice Gloe
rainglo@msn.com
3100 Guido Street
Oakland, CA 94602

Chelsea Madison
rolfandmarci@gmail.com
4386 Detroit Ave
Oakland, CA 94619

We need to save them to save the ecosystem!
JM McPeters
jjmcpeters@gmail.com
355 Granite Ave
Oakland, CA 95521

Judith Smith
axisdance@comcast.net
2712 Grande Vista Ave
Oakland, CA 94601

Jessie Root
shadeofgreen27@cox.net
155 Heritage St
Oceanside, CA 92058

Janice Foss
libraj@comcast.net
2435 Colusa St.
Pinole, CA 94564-1501

Francine Smiderly
lvindieflix@roadrunner.com
8816 Foothill Blvd, 203
Rancho Cucamonga, CA 91730

Susan Watts
susanmwr@aol.com
16217 Sunset Trail
Riverside, CA 92506

Sarah Hafer, sarah.hafer@gmail.com
1401 Wyant Way
Sacramento, CA 95864-2639

Rhonda Lynn
unicornocopia2000@yahoo.com
1630 T Street #4
Sacramento, CA 95811-7251

Karen Babcock
kbflys@cox.et
555 Front St. uit 903
San Diego, CA 92101

Simone Butler
simone@astroalchemy.com
1974 Titus St.
San Diego, CA 92110

Carol Gold
cag_92122@yahoo.com
San Diego, CA 92122

Alan Haggard
quantumcipher@gmail.com
1828 Gateway Dr.
San Diego, CA 92105-5104

Vicki Maheu
flkdancer@yahoo.com
8718 Macawa Ave
San Diego, CA 92123

We need to be responsible stewards of our lands and seas by protecting them at every turn.
Evan Roman
hobbs000@cox.net
4676 Greene Street
San Diego, CA 92107

I urge you to do all you can to prevent the depletion of river herring.
Megan Webster
mweb5089@aol.com
6650 Amherst Street
San Diego, CA 92115-2948

J. Barry Gurdin
gurdin@hotmail.com
247 Ortega Street
San Francisco, CA 94122-4617

Jackie Pomies
jbpomies@yahoo.com
1271 - 38th Avenue
San Francisco, CA 94122

Sustainable practices are essential to maintain the ecological balance on the earth. Common sense dictates that selling out the oceans for profit will hurt everyone.
Jewels Stratton
djjewelsann@yahoo.com
2233 Powell Street
San Francisco, CA 94133

Audrey Okubo
audreyokubo@hotmail.com
Oak Knoll Drive
San Jose, CA 95129

Kelly Rogers
steppintojoy1963@hotmail.com
2110 Cheryl Way
San Jose, CA 95125

Isaac Wollman
archaikclothing@yahoo.com
217 Westmont Ave
San Luis Obispo, CA 93405

Lori kegler
lgk9732@lausd.net
810 W. 27th St.
San Pedro, CA 90731

Camille Gilbert
camillegilbert@aol.com
1923 San Andres St Apt F
Santa Barbara, CA 93101

John Gregg
jrgregg@sbcglobal.net
1180 Lisa
Santa Cruz, CA 95062

Candice Barnett
cans1@mac.com
3101 5th St #3
Santa Monica, CA 90405

Dan Fogarty
fogarty830@aol.com
5423 Yerba Buena Rd.
Santa Rosa, CA 95409

Joe Salazar
houseofsavoy2000@yahoo.com
610 Cherrywood Dr.
Santa Rosa, CA 95407

Bo Svensson
bophoto@sonic.net
63 Westgate Circle
Santa Rosa, CA 95401

Kelly Hairgrove
rower21@cox.net
8701 Mesa RD #12
Santee, CA 92071

Cheriel Jensen
cherielj@earthlink.net
13737 Quito Road
Saratoga, CA 95070

Yuka Persico
yuka@persico.net
237 Goldenwood Circle
Simi Valley, CA 93065

The environment matters. All species matter!
Jim Phillips
rechog@earthlink.net
33 Mazatlan Dr.
Sonoma, CA 95476

Jillana Laufer
jillana@lauferco.net
3940 Laurel Canyon Blvd. #804
Studio City, CA 91604

Lynne Latham
llpdinc@earthlink.net
16678 Mountain Climber way
Tehachapi, CA 93561

Jena Hallmark
jena.hallmark@yahoo.com

32416 Hupp Dr
Temecula, CA 92592

M Canter
mcanter1@comcast.net
167 Blackfield Dr.
Tiburon, CA 94920

Alicia Jackson
Lametreza@yahoo.com
401 Goheen Circle
Vallejo, CA 94591

Anthony Montapert
amontapert@roadrunner.com
1375 Ficus Way
Ventura, CA 93004

Chester Starkweather
prosecutebushnow@ymail.com
13116 Chestnut
Whittier, CA 90602

Healthy waters + healthy fish = healthy environment = healthy people.
Cheryle Steele
cherylesteele@hotmail.com
11737 Colima Rd
Whittier, CA 90604

Tim Martin
timmartinsr@gmail.com
485 Mountain Home Rd
Woodside, CA 94062

Mary Ferraro
ferrarmt@hotmail.com
718 Fulton St
Aurora, CO 80010

I am originally from Massachusetts and New Hampshire. Saving the wildlife in our oceans will save us in the long run. Don't be shortsighted. Thank you.
Jennifer Thayer
thayer.jenn@gmail.com
8265 S. Poplar Way, #104
Centennial, CO 80112

Julija Merljak
sky_space@hotmail.com
18 Rooibekkie St.
Fairplay, CO 80440

Kristyn MacPhail
kristyn377@yahoo.com
9236 W Euclid Ave
Littleton, CO 80123

Georgia Mattingly
glmattingly@earthlink.net
412 Verdant Circle
Longmont, CO 80504-3908

Lorraine Kirk
howclear@earthlink.net
1934 Lazy Z Rd
Nederland, CO 80466

Melissa Savilonis
msavilonis@aol.com
96 Cornell Drive
Enfield, CT 06082

I feel that every living thing should be protected and saved. I love to watch fish while they swim and feed. They are very interesting, and to think of any waterway without them in there just wouldn't be the same. We have to save all living things! They all have a very important part in the world.
Regina Marino
reggie394856@att.net
20 Greenes Ridge Rd
Hamden, CT 06514

Kathryn Gallo
Kathy_Gallo@yahoo.com
312 Gravel Street
Meriden, CT 06450-4614

Drew Cucuzza
dcucuzza@snet.net
351 Central Avenue
New Haven, CT New Haven

Dee Dee Kurko
deeds49@cox.net
32 Barnard Drive
Newington, CT 06111

Marleen Dutra
yukondutra@yahoo.com
P.O. Box 11
Storrs, CT 06268

Carol Gabor, CAROLCgabor@aol.com
35 Concord Street
Stratford, CT 06614

John Pugzles
orca7j@aol.com
317 Old Post Rd.
Tolland, CT 06084

Lori Guillard
lguillard@charter.net
31 North Road
Windham, CT 06280

Edith Coleman
ecol0106@aol.com
2600 Frederick Avenue
Wilmington, DE 19805

Jared Cornelia
jaredc1200@yahoo.com
125 Denn Place
Wilmington, DE 19804

Stefan Kozinski
kozopreds@t-online.de
807 E. Matson Run Pkwy.
Wilmington, DE 19802-1109

Jeannine LeMay
wolfdenz@earthlink.net
4534 W. Blue Indigo Ln.
Beverly Hills, FL 34465

Laura Krause
krausela1@aol.com
160 W Camino Real
Boca Raton, FL 33432

Gloria Morotti, gmorotti@verizon.net
1111 14th Avenue West
Bradenton, FL 34205

Ana Alvarez, aairis@aol.com
11500 Brandiwine Ct
Clermont, FL 34711

Jan Brown
jbrown400@aol.com
2626 Shriver Dr.
Fort Myers, FL 33901

Mark Donaldson
azathoth-x@cfl.rr.com
1548 Croftwood Drive
Melbourne, FL 32935

Juana Garcia
fineartgalaxy@gmail.com
3201 SW 89 AVE
Miami, FL 33165

Esther Garvett
egarvett@gmail.com
10431 sw 143 ave
Miami, FL 331863033

Scott Logan
scott.logan@aon.com
1001 Brickell Bay Dr
Miami, FL 33131

Quida Jacobs
qlj888@ysahoo.com
1220 Marseille
Miami Beach, FL 33141

Constance Parry
conyad7@aol.com
9791 Autumn Haze Dr
Naples, FL 34109

Colonel Meyer
RonM430@AOL.com
3701 Eagle Pass Street
North Port, FL 34286

Cathy Houde
catsandcrocs@yahoo.com
1205 Vizcaya Lakes Rd
Ocoee, FL 34761

Hiten Shah
stellar.nick@gmail.com
2931 rollman rd
Orlando, FL 32837

Russell Riley
rrriley71@att.net
7954 Atlas Street
Pensacola, FL 32506-3652

Chris Witmer
dauchies@aol.com
109 Meadowlark Drive
Royal Palm Beach, FL 33411

Robert Keiser
skeiser@dadeschools.net
6131 SW 85 St.
S. Miami, FL 33143

Meaghan Leavitt
mleavitt@my.apsu.edu

2601 53rd Street North
Saint Petersburg, FL 33710-3449

Doug Landau
popcomic@tampabay.rr.com
150 73rd St. S.
St. Petersburg, FL 33707

Xuandai Hoang
xuandaihoang@yahoo.com
12817 Retoria Cir
Tampa, FL 33625

Suzy Siegmann
ssiegmann@gmail.com
212 Forest Park Ave.
Temple Terrace, FL 33617-4133

Darci Halloran
Dnh103@yahoo.com
3494 Fox Hollow Dr
Titusville, FL 32796

We are concerned about the industrial Atlantic herring fishery and its damaging impact on coastal fisheries and wildlife, especially on our river herring. SAVE the herring population/species NOW!
Mary McBride-Newcome
mmjmcbride@aol.com
631 White Ibis Ct
Winter Springs, FL 32708

Danna Williams
dlwillia@uga.edu
131 Helican Springs Rd.
Athens, GA 30601

Kyle Embler
kembler@Hotmail.com
662 Mercer Street SE
Atlanta, GA 30312

Gabriella Laczi
szeparcu@gmail.com
Nowelo
Hilo, HI 96720

The health of our waterways affects us all, we all need to do a better job of taking care of our planet.
Alex Oshiro
djrx.cares@hawaii.rr.com
1920 Kahakai Dr.
Honolulu, HI 96814-4820

Please keep the balance of our ocean ecosystems. Keep herring (and all fish populations) in abundance.
Lori Barrie
lbarrie@mac.com
15 Kulanihakoi St
Kihei, HI 96753

Fish are important no matter how big or small. We are all connected in some small and some big ways. Sustainability must be upheld.
Kaitlyn McKee
silversurferkauai@hotmail.com
94-1221 Ka Uka Blvd Unit 108-202
Waipahu, HI 96797

Dan Meier
lildan15@yahoo.com
924 Wets 12th Street
Cedar Falls, IA 50613

Sharon Joy Vieth
joyhyke65@yahoo.com
611 Memorial Dr. S.E.
Cedar Rapids, IA 52403

Jody Gibson
jodyg8@msn.com
317 E. Wall Ave.
Des Moines, IA 50315

Brandi McCauley
mccauleyf@mchsi.com
6215 Woodland Road
Des Moines, IA 50312

Dian Berger
dianberger@cableone.net
5639 E. Gateway Dr.
Boise, ID 83716-9041

Russ Berger
rgberger@cableone.net
5639 E. Gateway Dr.
Boise, ID 83716-9041

Robin Lorentzen
rlorentzen@collegeofidaho.edu
14250 Chicken Dinner Road
Caldwell, ID 83607

Casey Jo Remy
willandcasey@msn.com
PO Box 2489
Sandpoint, ID 83864

David Laird
DAVID11302000@YAHOO.COM
1130 West 9th Street
Alton, IL 62002-2320

Alison Halm
s_halm@yahoo.com
1631 Partridge Court
Arlington Heights, IL 60004-7966

Cara Ammon
clammon@yahoo.com
4556 N. Beacon #3
Chicago, IL 60640

David Atwood
david-atwood@comcast.net
10641 S Hale
Chicago, IL 60643

We need to stop destroying our earth and start taking steps to protect it.
Terri Barreras
tsb@pollina.com
6124 W. Melrose St
Chicago, IL 60634

Kathryn Dittemore
kdittem21@yahoo.com
3005 W Fulton
Chicago, IL 60612

Growing up in MA, I remember plentiful herring that fed lobster pots for bait and wild animals. They were also a tourist attraction. Save them.
Stephan Donovan
StephanDonovan@aol.com
4851 North Bernard Street
Chicago, IL 60625-5107

Yasiu Kruszynski
kruszynski.j@gmail.com
1100 W Addison St
Chicago, IL 60613-0011

Alicia Paravola
peapnut@hotmail.com
3643 N. Mozart
Chicago, IL 60618

River herring are like oxygen to the rest of the food chain. Don't cut off the food chain from the bottom!
Pauk Schutt
pls1helix@aol.com
310 South Racine Avenue
Chicago, IL 60607

T C
matrixkittikat@yahoo.com
16300 Heron St
Crest Hill, IL 60403

Jan Zanoni
janzan@comcast.net
1216 Elm Street
Glenview, IL 60025

Kelsey Miner
shy3x3@yahoo.com
401 S Railroad Street
Lovington, IL 61937

Sandra Couch
sndrcch@yahoo.com
2903 Bartlett Ct, Unit 201
Naperville, IL 60564

Janell Smith
JSMI777@FRONTIERNET.NET
P.O. Box 26
Newdouglas, IL 62074

P Gaspar
pgaspar@jhnetwork.com
6250 N River Road
Rosemont, IL 60018

Stephanie Cuba
stephaniecuba@comcast.net
302 East Street
Wilmington, IL 60481

Dina Frigo
dina.frigo@gmail.com
2028 38th Street
Highland, IN 46322

Gertrude Hammons
slowgranny@comcast.net
1018 N 24th Street
Richmond, IN 47374-2502

Toni Clark
sparrowmanymoons@yahoo.com
2314 West 39th Ave, Apt 401
Kansas City, KS 66103

James H. Fitch
jhfitch@usa.net
PO Box 26566
Overland Park, KS 66225-6566

Bethany Bradshaw
drumerj@yahoo.com
1437 Greenwood St.
Slidell, LA 70458

Sheryl Becker
sher1earth69@gmail.com
101 Regency Park Drive
Agawam, MA 01001

Bob Bousquet
bousquetrb@comcast.net
PO Box 101
Bryantville, MA 02327

As responsible voters and members of government, we have a duty to be conservators of our natural resources. Lacking that, future generations will not have these resources on which to rely.
Lynn Biddle
lynnbiddle@comcast.net
48 Rice St, #1
Cambridge, MA 02140-1817

Bonnie Faith-Smith
whiteowl1@comcast.net
290A Washington Street
Cambridge, MA 02139

Peter Reynolds
pjreynolds@alum.mit.edu
287 Harvard Street
Cambridge, MA 02139

Lani Blakeslee
lanibeedesign@gmail.com
437 Legate Hill Rd
Charlemont, MA 01339

Peter Cutting
pcutting67@gmail.com
15 N Main
Charlton, MA 01507

Tom Bailey
atbailey@ieee.org
45 Upland Rd
Concord, MA 01742

Janice Higgins
gigehig@gmail.com
66 Chmura Road
Hadley, MA 01035

Achmad Chadran
achadran@earthlink.net
206 Stow Road
Harvard, MA 01451

For over 40 years I've lived near the Herring river in North Harwich, MA, where the spring herring run was always an abundant and joyous celebration of life. It's tragic to see the numbers of herring dwindle each year. Please help set up policies to reverse this trend.
Paula Myles
carefulhands@earthlink.net
163 Main Street
Harwich, MA 02645

Ron Silver
rhinopias@comcast.net
114 Samoset Avenue
Hull, MA 02045

Margaret Silver
cattleya@comcast.net
114 Samoset Avenue
Hull, MA 02045

All fish in rivers and in the oceans are important to me.
Alice McGough
wind333life@live.com
16 Nohono Road
Mashpee, MA 02649

Patricia Sullivan. kauaipatty@yahoo.com
71 Milestone Road
Nantucket, MA 02554

John Cevasco, johncevasco@comcast.net
596 Millers Falls Rd, P.O. Box 78
Northfield, MA 01360-0078

John Meserve, flintlock95@msn.com
60 Dwelley St
Pembroke, MA 02359-1719

River herring are at the base of the marine food pyramid. They support highly valuable fish such as cod, haddock, stripers and tuna. We must restore balance and productivity to the marine ecosystem by protecting its base. We also need to protect flow in coastal rivers where herring spawn by establishing protective safe yield water withdrawal limits. As a boy, my grandparents took me to experience the herring run in Brewster, MA. I still recall the excitement of sticking my hand in the water and feeling the herring bumping into it. Will my grandchildren have that same opportunity?
Paul Lauenstein
lauenstein@comcast.net
4 Gavins Pond Road
Sharon, MA 02067

Caroline Darst
kittydarst@comcast.net
15 Seven Pines Avenue, #1
Somerville, MA 02144-2423

Emily Doutre
edoutre@gmail.com
5 Irving Street
Somerville, MA 02144

Nan Oggiono
nanykat@aol.com
3 Sadler Rd
Upton, MA 01568

The more our species can learn the art of moderation, both individually and collectively, the longer we can all survive, and the better off the earth as a whole will be. Thank you.
Sam Worthen
samworthen64@gmail.com
39 Green Gate Lane
Wareham, MA 02571

Jason Harlow
harlowfalcon@hotmail.com
170 Warren Street
Watertown, MA 02472

Julie Kennie
jkennie@comcast.net
10 Wheatfield Lane
West Dennis, MA 02670

Judy Wisboro
jwdem@aol.com
38 Tower St
Worcester, MA 01606-3527

D Chilcoat
denisepetjunkie@yahoo.com
1224 Bush Road
Abingdon, MD 21009

Denise Smallman
denisesmallman@comcast.net
12 Bush Road
Abingdon, MD 21009

Cathy Barton
cj_bart_2000@yahoo.com
517 Kansala Drive
Annapolis, MD 21401

Joyce Robinson
orcawolf@cablespeed.com
8010 Covington Ave
Glen Burnie, MD 21061

Brian Gibbons
btpg2252@yahoo.com
9133 Edmonston Ter, Apt 304
Greenbelt, MD 20770

Robert Stephens
robstepus@yahoo.com
4117 Crow Rock Rd.
Myersville, MD 21773

Nicole Weber
nicole4770@yahoo.com
7621 Paradise Beach
Pasadena, MD 21122

Katherine Babiak
kmbnyc@aol.com
8350 Wooddy Rd
Port Tobacco, MD 20677

Maureen Wheeler
maureen_d_wheeler@yahoo.com
304 Marvin Road
Silver Spring, MD

Suzanne Smith
Stone_Griffons@msn.com
6020 Oakland Mills Road
Sykesville, MD 21784

Roger Leisner
rleisnerrfm@yahoo.com
P.O. Box 2705
Augusta, ME 04338

The river herring are an important forage species, responsible as a keystone species for keeping entire ecosystems in balance. The wasteful bycatch of these fish should be stopped.
M. Valentine
valentine2638@roadrunner.com
RR 1
Portland, ME 04101

Lorne Beatty
lbeatty@blue-chip.us
573 N. Maxfield Road
Brighton, MI 48114

John Rokas
boobalina@yahoo.com
22168 Schroeder
Eastpointe, MI 48021

Judith Abel
indiansummer80@gmx.net
Zimmerhof
Harsens Island, MI 48028

Keeta Beaubien
keetaleeb@aim.com
4242 Betsie River
Interlochen, MI 49643-9575

Jon Krueger
sumsym@yahoo.com
5843 Seymour Rd.
Jackson, MI 49201

Benjamin Krohling
benkrohling@yahoo.com
3407 Harriet Avenue
Minneapolis, MN 55408

Jennifer Schally
NordicChicMN@aol.com
1104 Creekside Circle
Stillwater, MN 55082

Leah Goering
gymnast11animal@gmail.com
12 Dream Dr
Florissant, MO 63034

Nicole Strathmann
hotnrs82@gmail.com
1375 Swan Drive
Florissant, MO 63031

John Moszyk
Johnmoszyk48@hotmail.com
4278 Bordeaux
St Louis, MO 63129

Carol Hoke
carolhoke08@gmail.com
72 Lakeview Ct
Brevard, NC 28712

David Frazier
frazdt@gmail.com
907A North Greensboro
Carrboro, NC 27510

Bradley Buck
bradley.d.buck@gmail.com
3806 Secrest Shortcut Rd
Charlotte, NC 28110-9250

Jennifer Griffith
jbgrif@mindspring.com
902 Park RidgeRd. #A4
Durham, NC 27713

Bobbie Wendelken
marilynlov5@yahoo.com
5014 Millstone Dr
Durham, NC 27713

Jenny Church
jennylovesjasoncastro@yahoo.com
1410 Walt Arney Rd
Lenoir, NC 28645

Connie Bishop
connieb@charter.net
4827 Dentons Chapel Road
Morganton, NC 28655

Rose Troyer
rtroyer335@gmail.com
204 Berlin Way
Morrisville, NC 27560

Marie Michl
loveapeke@yahoo.com
108 Whispering Pines Drive
Rocky Mount, NC 27804-6332

Jackie Adam
adamja@mts.net
Box 194
Fargo, ND 58108

Doug Krause
dougkrause@mts.net
31 Battleford Bay
Fargo, ND 58108

Heidi Ludwick
heidicharnquist@yahoo.com
1009 South Madison St.
Papillion, NE 68046

Janet Fotos
janfotos@charter.net
26 Truell Road
Hollis, NH 03049

Irene Driss
ikie1@yahoo.com
60 N. Main St
Newmarket, NH 03857

Every part of the ecosystem impacts every other part.
Laura Magzis
Hippiedoc2@comcast.net
P.O. Box 8774
Penacook, NH 03303

Mr & Mrs Bruce Revesz
NOGBRUTRPT@GMAIL.COM
103 The Fairway
Cedar Grove, NJ 07009

It's time to become responsible for our environment. If we don't, we are engineering our own demise.
Jane Davidson
romjulcat@yahoo.ocm
435 Valley View Road
Englewood, NJ 07631

Lascinda Goetschius
lascindag@Yahoo.com
13-21 6th Street
Fair Lawn, NJ 07410

Michelle Muphy
murph121@verizon.net
334 Maddock Av e
Hamilton, NJ 08610

Valeriya Efimova
viy46@yahoo.com
563 Jersey Ave
Jersey City, NJ 07302

Nicole Zanetakos
nickiz4154@aol.com
12 Arthur Road
Kearny, NJ 7032

David Valentino
disney3@optonline.net
30 Falson LAne
Moeganville, NJ 07751

Carolyn Kohn
cnkohn2@yahoo.com
18 Van Beuren Rd.
Morristown, NJ 07960

Christina Little
tobylance@yahoo.com
One Kirkwood Ct
Mt. Laurel, NJ 08054

Dennis Morley
dadcos@optonline.net
104 Throckmorton Lane
Old Bridge, NJ 08857

Wanda Plucinski
wandatravels@comcast.net
1316 Wessex Place
Princeton, NJ 08540

Nick Berezansky
nick@acereprographic.com
123 Washington Place
Ridgewood, NJ 07450

Mary Rivas
rv221@aol.com
633 Lippincott
Riverton, NJ 08077

Michael Carney
mcarneyv@aol.com
25 Bowers Ave.
Runnemede, NJ 08067

We are the stewards of the wind and the water and the wood. It is our supreme responsibility to protect and foster the future generations of all species that we impact. The river herring need immediate action to

prevent the further unwinding of an ecosystem that already suffers so many of our burdens. I urge you to act swiftly and responsibly.
Laura Levey
laura_furman@yahoo.com
24 West Lake Court
Somerset, NJ 08873

Anthony Ivankovic
oko112002@yahoo.com
17 Jerome Place
Wayne, NJ 07470

Andrea Smith
andreasmith1985@aim.com
211 Florida Avenue
Williamstown, NJ 08094

Carroll Arkema
arkemac@verizon.net
221 Ringwood Ave - A3
Pompton Lakes, NJ 07442

Melinda Campos
jjroroc@gmail.com
12125 Ocean View Dr
Sparks, NV 89441

Ryan Muhammad
nationalexecutive@yahoo.com
8838 238 St
Bellerose, NY 11426

Nicholas Prychodko
prychdk@yahoo.com
PO Box 2138
Bridgehampton, NY 11932

Amanda Cartet
brooklyndachshund@yahoo.com
356 Ninth Street
Brooklyn, NY 11215

Tiffany Von Higgins
vonhiggins@hotmail.com
91 Driggs Avenue #3R
Brooklyn, NY 11222

Daniel Klein
dlmkn@yahoo.com
326 12th St., Apt. 2R
Brooklyn, NY 11215

Christopher Walsh
cdoobs@yahoo.com
750 Driggs Ave.
Brooklyn, NY 11211

Karena Wells
kwells98@yahoo.com
99 Clinton Street
Brooklyn, NY 11201

Keith Wynne
wynne.keith@gmail.com
134 Fort Greene Place # 2
Brooklyn, NY 11217

Christine Walker
christine.a.walker@gmail.com
147 Marine Drive
Buffalo, NY 14202

Saeah Hamilton
bigguy287@twcny.rr.com
9087 Tioughanack Rd.
Canastota, NY 13032-4224

Victorian Gaynor
vickiegaynor@yahoo.co
68-43 Burns Street A1
Forest Hills, NY 11375

Esther Weaver
edw200@gmail.com
47 Hawleys Corners Road
Highland, NY 12528

Joel Shimanoff
boatguy1@optonlie.net
37 Hutington Ave
Lynbrook, NY 11563

Richard Heaning
Bumper8220@aol.com
12 Seneca Dr.
Massapequa, NY 11758

Jennifer Valentine
faboo1028@yahoo.com
313 1st Ave
Massapequa Park, NY 11762

Christina Marcus
j94eva@aol.com
7 Emily Court
Medford, NY 11763

Joseph Alfano
janyc237@aol.com
235 East 57th Street
New York, NY

Leslie Cassidy
leslie_cassidy@hotmail.com
534 East 83rd St, Apt 2B
New York, NY 10028

Fletcher Cossa
fletchercossa@gmail.com
622 East 20th Street
New York, NY 10009-1410

Judy Ericson
judyericson@hotmail.com
45 Wall St.
New York, NY 10005

Valerie Gilbert
weareallone@verizon.net
345 East 56th Street
New York, NY 10022

Rachel Klingberg
rklingberg@pace.edu
11 Cornelia St
New York, NY 10014

Donna Knipp
knipp.donna@gmai.com
60 Seaman Ave., #2E
New York, NY 10034

Al Krause
akguiness@aol.com
19 Pomander Walk
New York, NY 10025

Jonathan Nash
jnash67@yahoo.com
500 East 83rd Street, #10B
New York, NY 10028

Jean Standish
jestandish@hotmail.com
308 East 6th Street
New York, NY 10003

Frances Saykaly
francsayka@aol.com
520 East 72nd Street
New York, NY 10021

Joel Finley
joel_finley2002@yahoo.com
630 Kendrickst.
Ogdensburg, NY 13669

Erin Yarrobino
bggr34@aol.com
84-23 109th Ave
Ozone Park, NY 11417

Kimberly Wiley
kwiley16@hotmail.com
72 Chimney Hill Rd
Rochester, NY 14612

Carrie Cammarano
carrie.ellen.cammarano@gmail.com
101 Forest Avenue
Rye, NY 10580

Rita Persichetty
onetreehugger@verizon.net
209 Currie Ave
Staten Island, NY 10306-3903

I LOVE ANIMALS JUST FOR BEING THEMSELVES!
Rebekah Roberts
beckster1981@hotmail.com
3476 Cooper St
Stone Ridge, NY 12484

Debra Myers
scooter2758@gmail.com
2112 Michigan Rd.
Wayland, NY 14572

Jean Naples
jnaples@jhsph.edu
9 Benson Street
West Haverstraw, NY 10993

Lisa Burroughs
burroughspictures@roadrunner.com
20 Arcola Dr
Ashtabula, OH 44004

Don McKelvey
donmckelvey38@gmail.com
Euclid, OH 44123

Patty Brothag, tanpatty1@aol.com
P.O. Box 525
Mantua, OH 44255

Victoria Brennan
victoriabrennan@sbcglobal.net
3206 Citation Lane
North Bend, OH 45052

Lydia Garvey
wolfhowlmama@yahoo.com
429 S 24th Street
Clinton, OK 73601

Angela Fazzari
angie951@aol.com
5414 NE Halsey St
Portland, OR 97213

Ann Hollyfield
hollyhast@aol.com
Box 70
Seal Rock, OR 97376

Patricia Montijo
sugarbearinvirgo@yahoo.com
25115 E. Broadway Ave.
Veneta, OR 97487

Shirley Smith
thiswritersturf@yahoo.com
25115 E. Broadway Ave.
Veneta, OR 97487

Anthony Capobianco
acapobia@comcast.net
101 Keystone CT
Bethel Park, PA 15102-4612

Charles Muehlhof
cmuehlhof@yahoo.com
603 Evergreen Pointe
Danville, PA 17821

Wayne Truax
rainman20@earthlink.net
120 Hollow Lane
Dillsburg, PA 17019

Jennifer Fullem
jc3jjj@comcast.net
1030 Taylor Drive
Folcroft, PA 19032

Aimee Abalo
fiorillolaw@verizon.net
RR Street
Girardville, PA 17935

Mark and judy Harvey
spiritbear@echoes.net
209 Emerson Road
Great Bend, PA 18821

Deanne O'Donnell
hottdeanne@hotmail.com
1177 Spruce Street
Greensburg, PA 15601-5344

Kelly Riley
khanlon74@yahoo.com
1343 Needham Circle
Hatfield, PA 19440

Lisa Rochelle
lisaroch@gmail.com
P.O. Box 202
Martins Creek, PA 18063

Jill Gleeson
jillgleeson@hotmail.com
401 5th St.
Philipsburg, PA 16886

Ruth Anne Dayton
radayton@sbcglobal.net
3836 Sunview Dr.
Pittsburgh, PA 152227-2635

Carol Thompson
mcact@comcast.net
2874 Amy Drive
South Park, PA 15129-8955

Nancy Orons
nancy_810@yahoo.com
810 Birchfield Court
Wexford, PA 15090

Robin Taborelli
robintab@cox.net
119 Gladstone Street
Cranston, RI 02920

I am a professional biologist (URI Ph.D.) and ecologist with a long career invested in conservation.
James Lazell
hq@theconservationagency.org
6 Swinburne St.
Jamestown, RI 02835

Rob Nobrega
rnobrega@email.lynn.edu

14 Capri Drive
Johnston, RI 02919

Virginia Smith
mooney7@hotmail.com
P.O. Box 224
Bon Aqua, TN 37025

Bettina Bowers Schwan
bettinaatwaldens@aol.com
4905 Tanglewood Dr
Nashville, TN 37216

Brandy Cole
marsa5959@yahoo.com
520 Starliner Dr
Nashville, TN 37209

Vince Mendieta
vinceofdarkness@hotmail.com
6005 Cherry Creek Dr.
Austin, TX 78745

Kristy Mitchell
harukahoneyh@yahoo.com
1701 E. Hebron Pkwy, #11106
Carrollton, TX 75010

Steven Rodriguez
srodriguez60@austin.rr.com
1024 High Grove Rd
Cedar Creek, TX 78612

Karen Miller
krisepoo@hotmail.com
129 Martha Drive
Corpus Christi, TX 78418

Dirk Rogers
dirk.rogers@sbccglobal.net
3404 San Jacinto
Dallas, TX 75204

Hiroe Watanabe
hirohiroe77@hotmail.com
5926 Worth St.
Dallas, TX 75214

MaElena De la Fuente
iscai@yahoo.com
PO BOX 912807 MSP 12-138
El Paso, TX 79998

Mary Price
fatcatpa@sbcglobal.net
801 El Cameno
Houston, TX 77058

Evelyn Adams
evie.adams@gmail.com
4920 Pecan Pl. DR.
McKinney, TX 75071

Rick Avant
ravant4@yahoo.com
13411 Wakewood Dr.
San Antonio, TX 78233

Tim Duda
timduda@aol.com
340 Queen Anne Court
San Antonio, TX 78209-6625

These fish are needed to keep the balance in our rivers. Thank you for your concern!
Mary Leon
leon1@grandecom.net
5 W Loop Street
San Antonio, TX 78212-4231

Without the "little" fish, the big fish don't eat. Without the "big" fish, humans don't eat. Our Gulf Coast has been grossly harmed by the BP disaster. Our coastline and estuaries have suffered tremendously. We can't afford any more additional environment damage, much less, more loss of the "little" fish.
Susan Rios, ssequine@centex.net
4112 CR 203
San Saba, TX 76877

Bennie Shallbetter
benniesuzan@gmail.com
300 Taylor
Smithville, TX 78957

Mindy Bradburn
daisy_diamond@hotmail.com
1770 Nursery Road
The Woodlands, TX 77380

Michelle Robertson
orcas_destiney@yahoo.com
165 N 900 West
Salt Lake City, UT 84116

Mary Alexander
dustybattleground@gmail.com
9725 Greenmeadow Circle
Glen Allen, VA 23060

Why do people feel the need to destroy every thing in their path? Nature is beautiful and provides us with beauty and sustenance. Yet we harness it to our wants, not for our needs. We are leaving little or nothing of the the beauty and health our earth has provided for our children. Please save a small part of earth by keeping it free from harvesting. Thank you for your time.
Simona Bergman
witegle@yahoo.com
13444 Carriage Hill Drive
Manassas, VA 20112-3837

Marorie Streeter
streetmm@mindspring.com
2320 Emerald Heights Court
Reston, VA 20191

Dr Robert & Ginny Bonometti
rbonomet@su.edu
260 Golds Hill Rd
Winchester, VA 22603

Jetta Hurst
jettahurst@aol.com
Auburn, WA

Nando A.
nandoof3@earthlink.net
16625 Kent Des Moines Rd
Des Moines, WA 98198

Amanda Mikalson
amikalson@gmail.com
PO Box 135
Farmington, WA 99128

Marilyn Hurrell
redhlm@comcast.net
9910 S 248th Place
Kent, WA 98030-5104

Fuoad Shashani
z6zmusic@hotmail.com
501 South 218th St
Normandy Park, WA 98198

It is our resonsability to be logical people in 2012 and on. Thankyou.
Shelly Peterson
shellyslily@live.com
301 South 82nd St, #5
Tacoma, WA 98408-5813

Robyn Cleaves
Nursekitty83@yahoo.com
P.O. Box 65366
University Place, WA 98464

Suzanne Hamer
atkinshamer@comcast.net
17227 NE 195th St.
Woodinville, WA 98072

Nancy Gathing
gathingn@yahoo.com
3701 Tulane Ave.
Madison, WI 53714

Britton Saunders
brittik@aol.com
2975 South Wentworth Avenue
Milwaukee, WI 53207

Joyce Frohn
AHengst1@new.rr.com
425 Congress
Oshkosh, WI 54901

Mark M Giese
m.mk@att.net
1520 Bryn Mawr Ave
Racine, WI 53403

Diletta Bianco
dilpetrucci@hotmail.com
via ponte prelle
vico canavese
Italy

Merce Escayola Cabrejas
mescayola@vulkano.net
Carrer Sants, 34 Bis Pral. 1ª
Barcelona, 08014
Spain

Natalie Van Leekwijck
hoepagirl@gmail.com
Boterlaarbaan 184
Deurne, 2100
Belgium

Chantal Buslot
chanti@odie.be
Meybroekstraat 46
Hasselt, 3510
Belgium

Marleen Paulus
marleenpaulus@hotmail.com
Jules Lowetlaan 10
Hoegaarden, 3320
Belgium

Lorenz Steininger
schreibdemstein@posteo.de
Waldstr.
Hohenwart, 86558
Germany

Anna Fontaine
annalouisefontaine@yahoo.ca
102 Chemin du Lac Cloutier
Lantier, J0T 1V0
Canada

Michael Ranger
Casca@start.ca
967 Huron St, E.
London, N5Y4K5
Canada

Arturo Franco
bathorynasdasdy@hotmail.com
Republicas 266
Mexico City
Mexico

Please conserve the fish in the rivers and oceans.
Kenny Hogg
jeanandkenny@blueyonder.co.uk
27 Birch Avenue
Perth, PH26LE
United Kingdom

Theodore Spachidakis
theo_spachidakis@yahoo.gr
ii merarchias 2
piraeus, 18535
Greece

Jasmina Cuk
jasmina.cuk@hotmail.se
Karolinska v 18
Solna, 17164
Sweden

Elisabeth Bechmann
elisabeth.bechmann@kstp.at
Neugebäudeplatz 4
St. Pölten, 03100
Austria

Andrea Sreiber
suomigirl666@hotmail.com
Zmaj Jovina
Subotica, 24000
Serbia

Mervi Rantala
rantala.mervi@gmail.com
Tesomajarvenkatu 20 b 23
Tampere, 33310
Finland

Diletta Bianco
dilpetrucci@hotmail.com
Via Ponte Prelle
Vico Canavese, 10080
Italy

Selva Carnevale
farm@selvacarnevale.com.ar
Misiones 2661
Villa Gobernador Galvez, 2124
Argentina

Ewa Piasecka
ewapias@gmail.com
Mickiewicza 27
Warsaw, Warsaw
Poland

Jackie Adam
adamja@mts.net
Box 194
Winnipeg, R2P 1H8
Canada

Aurélie Bonnet
bonnet.aurelie@9online.fr
Antony, 92160
France

Sarah Mumford
sjmumford@hotmail.co.uk
Dalvait Road
Balloch, G83 8LB
United Kingdom

Esther Juhl
estherjuhl@googlemail.com
Lüdenscheider Weg 5g
Berlin, 13599
Germany

Marian Giesbers
marian.giesbers@zonnet.nl
stekkenberg 114
groesbeek, 656xn
Netherlands

Nathalie Sahki
sahki.nathalie@bbox.fr
6 Chemin de la Pisserotte
LA CELLE SUR MORIN, 77515
France

Elizabeth Whelan
wolfapache7@aol.com
9 Gulland Walk
London, N1 2RL
United Kingdom

Dominic Delarmente
ps_617792650@care2.com
Block 3 lot 14 Jehai
Pasay, 33000
Philippines

Panagiotis Rigopoulos
panarigo@care2.com
Agiou Georgiou 77
Patra, 26225
Greece

Corine Cathala
corine.cathala@hotmail.fr
Le Rocher
Pierrelatte, 26700
France

Georgeta Predeanu
gpredeanu51@yahoo.fr
al.Tineretului
Slatina, 230042
Romania

Mervi Rantala
rantala.mervi@gmail.com
Tesomajarvenkatu 20 b 23
Tampere, 33310
Finland

Appendix X

Amendment 5 Public Hearing Summaries



New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. "Rip" Cunningham, Jr., *Chairman* | Paul J. Howard, *Executive Director*

Draft Amendment 5
Public Hearing Meeting Summaries

Rockland, ME
Gloucester, MA
Portsmouth, NH
Fairhaven, MA
Portland, ME
Plymouth, MA
Warwick, RI
Cape May, NJ
Mystic, CT

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Samoset Hotel
Rockland, Maine
March 2, 2012, 9 a.m.

Hearing Officer: Terry Stockwell
Other Council Members in Attendance: Mary Beth Tooley
Council Staff: Lori Steele
Attendance: Dave Ellenton, Sean Mahoney, Rick Usher, Dave Mason, Don Sproul, Rich Ruais, Barry Murgita, Shawn Rockett, Zack Klyver, Pete Douvanjo, Jim Ruhle, Chris Weiner, Barry Gibson, Arnold Nickerson, Gary Libby, Kim Libby, Ted Ames, Mike Brewer, Lisa Kushner, Frank Ohara, Robert Eugley, Dana Hammond, Karin Spitfire, Scott McNamma, Glenn Robbins, Roger Fleming, Lauren Wahl, Trevor Lyle (approximately 50 people)

Mr. Stockwell introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document.

After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5. Initially, comments were solicited section-by-section, but because of the overlapping nature of the issues/measures in Amendment 5, the floor was opened to comments on any elements of the draft amendment and public hearing document.

Public Comments

Glenn Lawrence, F/V Double Eagle (Herring Carrier): I'm not sure what the requirement means that I will have to accurately weigh all fish that I have to deliver to my customers. We are not really set up for that. It's like a building with barrels that we pump fish into. Is volume going to be OK for that?

(Ms. Steele clarified that this is the kind of input that the Council is seeking regarding the logistical issues associated with a requirement for dealers to weigh all fish.)

I was guessing that you were targeting million pound carriers that load trucks all day long. I only have a thousand bushels, and that measures out the same every time.

Rich Ruais, American Bluefin Tuna Association (ABTA): (Mr. Ruais asked for clarification regarding the comment process and indicated that he would like to comment generally on several sections of the draft amendment and asked for clarification about comments on the draft amendment versus Draft EIS)

I recognize that there will be more public hearings and then again on DEIS, so we won't be lacking for time to submit comments. ABTA will submit written comments.

Tuna fishermen are legitimate stakeholders in this issue because it's known that reason they migrate at all are for feeding and reproducing. It is also known that in New England their favorite food is herring, so how goes the herring is how goes the bluefin tuna fishery. That's why tuna fishermen started CHOIR. We are very pleased to see progress to date and will continue to follow this through.

One thing I am struck with thinking about the herring plan and the bluefin plan is that that both of them are based upon false scientific premises, and they are both huge issues. What got this problem started with pair trawling and midwater trawling in the herring plan was the scientists at the Northeast Fisheries Science Center announcing that the once extirpated stock on Georges Bank was now back and you could take a million metric tons for several years without having any impact on the spawning biomass, and that you could have a sustainable yield of about 400,000 metric tons every year. And that opened a lot of eyes and brought businessmen into the fishery. And they were prepared, when dealing in a fishery with that volume, that you want to be operating with very large vessels with a million ton capacity. That was a false premise. We know see based on the revised science that the best MSYs are going to be substantially lower than that. With bluefin, quickly, the false premise was that you could draw a line in the middle of the Atlantic Ocean and assume mixing doesn't happen and that you could rebuild the stock on the other side. We were held to strict regulation on one side of the ocean while nothing was happening on the other side. We wasted an incredible amount of money and disruption to the entire New England fishery based on that. It was an interesting parallel between the two fisheries.

ABTA is very concerned about five areas of the plan. First, implementing 100% observer coverage on A and B vessels may be the most critical component of the amendment. We don't believe you can rely on self-reporting. We are also concerned about observer effect as we move forward in time. It is not unreasonable to suggest 100% observer coverage on targeted fisheries like this. For example, the Gulf of Mexico pelagic longline fleet, because of concerns about fishing during the bluefin spawning season. To wrap this up, the Feds did find that they had the manpower to provide very high coverage. They have demonstrated they can target the resources for fisheries in dire need of ground-truthing and basic information on the fisheries. Also, the midwater trawlers have a lot of privileges in the fishery, and what comes along with this is the need to cooperate with management.

The second recommendation we feel strongly about is that the Council should implement Closed Area I provisions with trip termination after ten events to reduce dumping on Category A and B vessels.

The third concern is that the Council should implement measures to require weighing of catches across the fishery. We started this one back in the 1990s when arguments were being made that the herring FMP was one of the best plans because we had a Hard TAC, but yet there was nothing to deal with underages and overages, and that catches are not physically weighed. It's hard to make a claim that fishery is being controlled by a hard TAC when you are not weighing the fish. You need to find a way to weigh the catch through measures that are not overly burdensome to the industry or that require major investment by processors.

The second to last comment I will make is that the Council should prohibit midwater trawl vessels participating in the herring fishery from access to groundfish closed areas. We know that

midwater trawling is a bit of a misnomer, and the gear is capable of fishing on the bottom. It is not fair to groundfish fishermen or anyone else that they are allowed to fish there.

We pushed hard for seasonal GOM closure from June-September because of the localized resource depletion we saw, and the noise and fear factor the midwater trawl boats were causing that move the bluefin out. We were encouraging them to move offshore. We are sensitive to recommend now that we have been forced offshore because they still continue to fish inshore right up to the beginning of the season, and the herring stock is reduced in the Gulf of Maine as a result of that. The small tuna boats have been pushed offshore to northeast peak of Georges Bank carrying fuel bladders, and it is a very unsafe condition. And then, as soon as we find the tuna, the pair trawl vessels come there. I don't know how we solve this, whether it will take a series of time/area closures so the two fisheries can coexist, or whether managers will recognize that it was a mistake to begin with to allow vessels of that size and that efficiency to come into that fishery. It was a legitimate honest mistake based on false scientific information that suggested a much higher TAC that would have required an industrialized fishery to catch that fish.

(Chris Weiner from CHOIR asked a clarifying question regarding if/how the river herring measures may apply to Category D permit holders.)

Gary Libby, Port Clyde, ME: lobsterman, groundfisherman from Port Clyde ME. I am also shrimp fisherman.

I would like to see 100% observer coverage on A/B vessels only because they account for 97-98% of landings in the fishery. If we get that much coverage, the guys fishing under the C and D permits on smaller boats inshore would have an opportunity to go fishing without being forced to use herring observers and paying for them out of pocket, which I don't think they would be able to afford to do. That would cover the guys that are in river herring too. The catch by C and D is incidental. I think we could do an estimation of the catch of the 1-3% of the total that those guys may encounter.

The second point would about the Closed Area 1 rules. I am in favor of trip termination after ten events. There has to be some sort of accountability for either slipping or dumping. Knowing that dogfish is an exemption, I think this should be on A and B vessels once again because they are the major part of the fishery.

In terms of catch weighing, I was up in the air with this. I talked to a bait dealer in Port Clyde about this. And based on the conversation I had with him yesterday, I think that what they are doing now is accurate, and if it isn't broken, don't fix it. The dewatering has been a problem. I have been through plenty Committee meetings and discussed this one issue. I think the estimations are pretty good. I know there are a lot of folks who don't understand how you can get an accurate weight that way, but when I go lobstering, I buy bait out of barrels that hold three fish totes. And every one of those barrels all year has three fish totes in it, so it's accurate to a percentage, I'm sure. And I think it's pretty close.

The most important part of this amendment, to me, is restricting midwater trawl and pair trawls from the groundfish closed areas. I have had fishermen in Port Clyde give me their take, and they say closed is closed. They don't believe there should be any activity in these closed areas. I think that under the habitat amendment, we may be able to reach that when those areas get re-

defined. For this amendment, I don't believe that there should be access in there, but if access is allowed, I want 100% observer coverage. If it gets too expensive for the industry, I would like to see provisions put in for on-board video cameras. I used these last summer on my groundfish trips. When the observers realize there is a camera on the deck, we get better performance from the observers. They don't take tows off, they are there for every sample. If nothing else, we get better data if we use them.

Jim Ruhle, Wanchese NC: (asked a question/commented on the public hearing process and how comments from one individual are weighed/valued versus comments that are signed by multiple individuals)

The observed trips that have taken place on my boat should carry as much weight, if not more, than anything else. Observer reports should be best available data. Since Amendment 4, the level of coverage on the herring fleet has doubled to the point where you are at a very high number of observed trips. It is critical to recognize that this information is best available data. The first thing that will be said during the meeting in June is that the information has not been analyzed and we cannot incorporate it. You can, in fact, analyze it by going forward with the components of this amendment that you have data for, and state clearly that when new data is analyzed and a scientific determination is made from that information – at that point, you will act with the information that is needed to make a reasonable determination of what is going on.

I am here to represent traditional small boat bottom trawl herring fleet that primarily fishes in Rhode Island. I sat on the Herring Committee as the Mid-Atlantic Council representative through the development of Amendment 1. I am involved with a fishery now that is the cleanest fishery I have ever participated in in my life. You don't have to take my word for it. I have enough observer data on my boat that this is no longer anecdotal. When I can provide to you levels of bycatch in the directed herring fleet that are less than a fraction of a percent, in the one-eighth to one quarter of a percent, this has to be included in the information. The truth is in the data. The industry that I am involved in, even the midwater boats, have reached out to get help and verify what we are talking about. I am in the study fleet and the SMAST bycatch avoidance program, as well as traditional observer coverage that takes place. And dockside monitoring of the catch takes place – not every trip, but if I am fishing rail to rail with six boats, the catch from three will be monitored, and the catch from the other three will be identical.

The abundance of these fish is at an all-time high now. I have been fishing 47 years. 85% of Area 2 was taken from the tip of Jamestown Island to the north end of Block Island this year. It is incredible that much fish can be taken from that small of an area.

We have experienced a year this year that we have never seen before. The bycatch avoidance program would have failed this year. Every alternative in the bycatch avoidance program would have failed this year because the proposed areas have no fish in them other than dogfish. Every one was too far offshore. This year, unlike any other year we have seen, the herring traditionally migrate from the beach out 20-30 miles. This year, the fish all came down 2-3 miles, one narrow piece of water. The fish, each year class, kept replenishing themselves. The race to fish for herring this year was the best thing that could have happened because it targeted a clean fishery for any size fish you wanted.

The only way to have a successful bycatch avoidance program is to have it in real time, just like with the scallop fishery and yellowtails. And just like we did with a small group of fishermen this year, we reported daily and got an email every 2-3 days with bycatch areas. We knew where the bycatch areas were. The results of this year's SMAST program need to be expanded. The potential for that is a very positive functional program that does what you want it to do. It never works to draw boxes. All the areas you suggest in this document to close were slammed with dogfish, and there were no herring there.

As an industry, we do not target river herring. In my opinion, the assessment is going to fail because they are not separating bluebacks and alewives. They don't necessarily co-exist. There are many issues going on with river herring that have nothing to do with bycatch. My concern with river herring is to verify with the bycatch that we are not responsible. There has been significant degradation of habitat, and of rivers and streams. Look at sturgeon. You can pollute a river for river herring with light and sound. These fish are very sensitive. The regime shift that has taken place from Florida to Maine with every species – the "Northeast Push" – has got to be seen as part of this problem. The entire herring fleet can demonstrate that the bycatch levels associated to the herring trawlers is minimal.

When it comes to observer coverage, there is an easy way to fix this. I fish responsibly. We have come forward and done everything we could to verify everything we are telling you. It is not anecdotal anymore. It is scientifically-supported. The study fleet is considered almost as high level of confidence as an observed trip. That's self-reporting by the industry, with everything you get – ocean temperatures on every tow, tow times – everything you get with the study fleet is now being recognized, and I think it will continue to be so.

To determine the observer coverage, the Council can review the performance of every boat in the herring fishery. You will find that the majority of players have fished responsibly for the most of their careers. Everybody can have interaction with another resource – it occurs, but the level and number of times is another thing. There are a handful of boats that have bycatch events. They are the ones that deserve 100% observer coverage. Those of us who have demonstrated responsible fishing year after year do not. We deserve the random observer coverage that is adequate to meet SBRM levels. We are there, and it is not anecdotal anymore.

I cannot fish for any other species that I have a permit for as clean as I can for herring. Bycatch is the result of management measures. Bycatch isn't a bad thing at certain levels. It is fully misunderstood. I cannot do better than I can in the herring fishery. I am excited to go fishing every day for herring because you are going to be catching a lot of clean fish. The most rewarding part is that when you establish yourself in the marketplace, you know your price. You know how many fish you are going to catch, and you can help other fishermen find clean catch. You are doing what's right for the resource and the industry, and it's fun.

In terms of weighing the fish, all of us in RI unload the same way – we pump RSW product into trucks. That truck is how we get paid. That is all you need to know. The trucks traditionally hold 22 vats. It's 1,800 pounds per vat. You can get 1,900 pounds in it, you can get 1,700 pounds in it, but we don't have time to make the determination. Keep them at a level the driver wants. When a truck gets to where it's going, 2-3 of those vats are weighed, and then the average is carried across the truck. I haven't had a single truck come back this year far from 1,800 pounds to the vat. And that's how I get paid, and that's the only number you need to worry about. The plant isn't going to pick out 20 or 30 pounds here and there out of a vat. It's

an average, and it does work. To simplify my reporting, I have a dealer permit so that I know I report exactly what the VTR shows that I am catching. I just pass the VTR to myself, and I have not had any issues with this.

I am representing 9 boats out of RI, all single bottom trawl vessels. They will participate but don't have time to submit written comments. I don't have time to submit written comments. But take it to hear that regardless of others opinions, this is a clean fishery. Look at the data created since the implementation of Amendment 4. Use the observer data to make your determination for Amendment 5.

The Council can approve, disapprove, partially approve this amendment. My suggestion with Amendment 5 is to go forward with the non-controversial elements in June, and take the time to analyze and make the right decisions with the right data for the other components. Just establish a time certain, and you can get there.

Glenn Robbins, F/V Western Sea: I have been fishing for over 40 years. I represent the purse seiners. I have traditionally fished with a seine, and we have hardly any bycatch. In terms of trawlers, Jimmy probably does as good as anyone, and I have fished with some of the small boats with my seine down there. We have touched bottom, and we haven't caught much groundfish down there. But in the Gulf of Maine, I have run into more groundfish. I have caught pollock on Jeffreys, and I have had some codfish. I have never caught a haddock in over 40 years. But now we are starting to target herring on Georges Bank, and there is more haddock being caught. There is a problem with trawlers, we know that – and they are not midwater trawlers, they are bottom trawlers. Just as they outlawed pair trawling for codfish, they should do that with trawlers in the Gulf of Maine, especially in those closed areas – you cannot let trawlers in a closed area.

In terms of weighing fish – we used to weigh them as hogshead, then bushels, now pounds. Every time I sell a herring, I try to get the most for my buck. The carriers deliver to the islands – they don't have scales, but the totes or bins have been measured, and fish have been weighed for a long time. It will be complicated to weigh the way that they come in. Some come into port, and the fish go on a conveyor belt and get weighed after they get into a box. The best way I can see is to probably weigh the truck before and after, and subtract out a little water depending on whether it's small fish or large fish.

Mary Beth Tooley, O'Hara Corporation: I support Jim Ruhle's comments. I am speaking for the O'Hara Corp. We operate two midwater trawl/purse seine vessels and have been in the fishery for a number of years. I think that I would like to stress that we support the goals and objectives for the monitoring program – to create a cost effective and administratively feasible program. We support observer coverage in the fishery. The information that has been gathered to date has been helpful to understand our fishery. But the problem in the northeast is the cost of the program. Many people have made comments about the size of the vessels and made parallels to vessels that fish in the Bering Sea. In the Bering Sea, a pollock vessel pays $325 day for an observer, and the gross for that vessel is more than the entire gross for the herring fishery in the northeast. The greatest challenge we have is cost effectiveness.

We support observer coverage in this fishery, even to a level of 100%, but it has to be cost effective, and the industry has to be able to afford it. It is not a beneficial program for any of us if the first thing it does is get rid of every mid-sized to small vessel in the fleet because they cannot afford to go fishing anymore.

We did have a provision in the amendment for a dockside monitoring program in this fishery. It was taken out about a year ago. We think the Council should reconsider that and move forward. The Science Center had concerns, which is why it was taken out. But for a volume fishery like herring, it is the best way to sample the fish and the fishery, and we think the Council should reconsider that.

Ed Snell, jig fisherman from southern ME: I also have seven seasons of experience on party fishing boats and whale watch boats.

I support 100% observer coverage for A and B permits. When they catch that much of the fishery, it only makes sense. I also support closures for river herring. There is data that suggests that a significant reason for decline of inshore groundfish stocks is because the groundfish were there feeding on staging river herring. Having those nearshore fisheries are vital for small boat fishermen, as well as bluefin tuna fishermen, and whale watch boats because they only have four hours to make their trips. Having the whales close to shore is valuable.

It makes no sense for midwater trawlers to be in groundfish closed areas. Closed areas are closed areas. Lobster fishermen should not be using haddock for bait.

Some of the problems we have is because these boats fish rail to rail. That kind of concentration is detrimental and disrupts the migrations of a lot of fish looking to feed on herring.

I am young fishermen, and I am not going to inherit any money from midwater trawl boats, but I will inherit what they leave behind.

Barry Gibson, NE Regional Director for Recreational Fishing Alliance (RFA): RFA urges 100% observer coverage on Category A and B boats. The amount of discards these boats are capable of fully warrants observer coverage, and this is done in other parts of the country.

Second, RFA encourages trip termination after 10 dumping or slippage events in Closed Area I to dis-incentivize non-legitimate dumping incidents.

Third, we feel the Council should implement measures to require the actual weighing of catch rather than estimates.

Finally, RFA feels that access by midwater trawlers to groundfish closed areas should be prohibited. I served on Council from 1986-1995, a number of those years as Chairman of the Groundfish Committee, when we developed these areas and implement restrictions to protect spawning cod and other groundfish. As we know, herring nets are quite capable of catching groundfish of any size. These fish need these areas to reproduce, something we are all encouraging, especially given the results of the latest cod assessment and recent projections on haddock and other species. RFA believes that we need to do everything we can to protect groundfish and bolster the stocks.

Karin Spitfire, river herring advocate: I am a river herring advocate. I eat fish. I have been eating sardines and herring my whole life. In 2007, I heard the herring quotas were cut in half and I started paying attention. I am here to provide an outsider point of view for a minute.

Since the Grand Banks collapsed in the 70s, we are down to shellfish and herring. All the other species are a dribble of their former abundance. Fishermen were not included in the dialogue or regulation and science until recently. The fishermen who used to see herring talked about being able to walk across the coves on top of them along the coast of ME.

It is also astonishing to me that fish are still being managed by species instead of a holistic ecosystem approach. This is 2012, and we know that everything is connected to everything. I want you to choose the most restrictive amendments. I want 100% observation on Category A and B because they are the bulk of the herring catch. Based on what I have heard today, I don't need to weigh the fish. The river herring areas should be closed. Groundfish closed areas should be closed and restricted to herring vessels as well as the groundfish fisheries. I couldn't understand the information about the dumping restrictions, but I would like that to be the most restrictive on Category A and B vessels. I am asking for this because we all know that this is already a big compromise. There are many people who would ban midwater trawlers altogether, and that isn't even on the table. It is also a big compromise because the data we are using are based on what fish we have left and has no relationship to what we had before the fisheries got to this state, when we couldn't possibly have counted herring or cod.

Zack Klyver, Bar Harbor Whale Watch: We favor Section 3.2.1.2 Alternative 2, Option 2 – 100% observer coverage and government/industry funding. We got involved in this issue because of a bycatch event we saw in 2003, where we saw hundreds of thousands of pounds of whiting on the water. We saw the impact of what can go wrong. We feel that 100% is necessary to get the good information. This will always be a political issue unless we get the information. We need this information for stock assessments, for determining mortality of herring and other fisheries. Having the full amount of information is critical. We hear that midwater trawl and pair trawl boats don't want to catch groundfish or occasionally marine mammals, and don't want to dump fish, but that these are the prices of doing business. This mentality has to end. It is no longer the wild west out there.

35% observer coverage doesn't get us there. To me, 100% observer coverage is the compromise. This is because these large boats are so mobile. Without observers, they can fish close to the bottom, they can be more aggressive about pursuing fish they may not be sure are herring, they can fish closer to mammals, and they can dump fish. Having observers will bring transparency to the process that is critical During Amendment 1, we heard a lot of stories of what is capable with bycatch – codends full of seals, pods of dolphins being caught, tons of groundfish and striped bass. Without 100% coverage on these larger boats, there will always be speculation. The Council needs this to be good stewards of the resource.

Regarding funding, if the industry believes they have a clean fishery, they should support 100% observer coverage because that will clear up the question. I am glad to hear that they are in support of 100% coverage. To me, if the bigger boats need to pay for observers, then that is fair. That should be the price of doing business. They are reaping the benefits. If they have a sustainable fishery that is managed well and is healthy, they will get the windfall for that. Having an observer is not too much to ask.

Don Sproul, Bath, ME: Tuna Fisherman, representing NETC and ABTA. I agree with Rich Ruais 100%. I think 100% coverage is needed on boats that are going to take tonnage – not day boats. Herring is a clean fishery, but if you take that trawl and you rig it for the bottom, it's not a clean fishery.

A closed area is a closed area. If you close down 95, you are not going to just let the big trucks through. It's closed, no question.

The thing that worries me is when I was on a mooring, and was being asked to move. The boat went around me, and then I saw miles and miles of cod floating everywhere, dead. After seeing that, I followed the boat and was amazed at the destruction. I have seen it in small boats. Once the fish come up, they will go back dead, whether you look at it or not. The better solution is to put the bag on the boat, land it on the deck, and count it. You better be able to use the technology to read what you got. If you make the trawl, you are responsible for it, and it counts against you regardless of what it is. If you have to terminate your trip, that will teach people to be more accountable. Accountability is the big thing.

Pete Douvarjo, VP Maine Charterboat Captain's Association: I am about the furthest north charter boat captain in the State of ME. I support 100% observer coverage on A and B boats, and I believe they should stay out of the closed areas. Closed is closed, and I too have seen evidence of bycatch. Everyone needs herring, so I think fairness is something that we should think about. This is something that shouldn't be taken by a few big boats.

Mike Brewer, purse seine captain: We hold a Category A permit, but I am a small purse seine boat – the smallest purse seiner in the fleet, 50 foot. I am all for the observers, but on my boat, it's very small and confined and almost dangerous to take the extra person on the boat. I already have four guys on there, and he has so much equipment – I am for the observers, but it is very hard to take him every trip.

Kim Libby, Port Clyde ME: I also agree with 100% observer coverage. I think it is a misnomer to call midwater trawl vessels midwater trawl because there are documented instances where they run into groundfish. Also, a remark was made about bottom sensors not being good because they would keep breaking. If you are towing midwater, how do you break bottom sensors?

I have an observation, or a rhetorical question. Midwater and pair trawlers are banned pretty much everywhere else in the United States. Why is it okay to have them here in the Northeast, where fishermen have struggled and sacrificed, when they are capable of localized depletion and impacting the ecosystem because herring is a forage fish. Everything feeds on herring. It almost makes you wonder sometimes if there is insider stuff going on. We all know how corrupt Washington is, and palms are greased on a daily basis.

Chris Weiner, ABTA and CHOIR: I am speaking for myself. I am a commercial harpooner for bluefin tuna, third generation.

The reason we got involved is because I don't think any fishery other than ours had spent more time around the midwater trawl fleet. Everywhere they went, they were there. We were impacted greatly by this. Most people I have talked to about this amendment just wants the gear banned. Most people I talk to want this. This amendment is a compromise.

Some people are fighting against 100% observer coverage when there are 12-14 or so boats catching almost the whole herring quota. They caught 20,000 metric tons in a month and a half. I would like to know where all that went because there aren't that many lobstermen around right now. It would be smart for that part of the industry to realize that everyone is out to get rid of this gear. We have been looking for a way to make this work – herring and tuna keep me up at night. Herring is half the battle when it comes to tuna. I fully respect Jimmy, but I disagree that there is more herring around than I have ever seen. We had some herring in one area this summer, and then the fleet came in October 1 and caught 20,000 mt right off Cape Elizabeth. The whole fleet was there. The point is that things are not looking good, and we wouldn't be at these meetings if we thought they were looking good. I support 100% coverage. I don't think that is too much to ask for 150 foot boats using pair trawls.

The dumping rules are important too. We aren't making these things up. I have been around the fleet, and we know guys that work on these boats. Dumping has been a problem in the past. Closed Area I rules showed that the gear can be used cleaner. The problem now is that you have prioritized coverage offshore which is why the coverage level has gone up. I would like to know the coverage in the other areas, but 30% coverage and 90% offshore trips covered, what does that leave for the rest of the areas? It's less than 30%. I got involved in this not because of what's happening five miles from the Canadian line. I worry about the inshore. I think that you need to go with 100% to get the whole picture. I don't think it's crazy to ask that, and it's better than what a lot of people are asking for. We hear all the time that it is a clean fishery. If someone were saying this about my fishery, I would want 100% coverage right now.

Sean Mahoney, Conservation Law Foundation (CLF): We support 100% at-sea monitoring and not having midwater trawls in groundfish closed areas, and also the weighing provisions, Section 3.1.5 Option 2. Two things I would like to focus on:

The first is that we think it's very important to have an effective accountability system to discourage dumping. To that end, we support Alternative 4D in Section 3.2.3.4, which would be trip termination after five slippage events for the herring management areas.

The second is the catch limit or cap on the total amount of river herring. We support 3.3.5 but we think that it should be modified to require immediate implementation of a river herring catch cap. This has been a five-year process, and it's important that this be ready to be implemented for 2013.

Peter Speech, tuna fisherman: I am a commercial bluefin tuna fisherman, and I agree with Rich Ruais that we should 100% observer coverage on A and B vessels, and that closed areas should stay closed, especially to pair trawl and midwater trawl boats.

Jim Ruhle, F/V Darren R, Wanchese NC: A couple suggestions as this plan goes forward.

First, regarding the bycatch levels for river herring in the southern New England small mesh fishery – I think that prior to 2008, there was some confusion with species misidentification. But more importantly, the threshold utilized was 1000 pounds, and that is not a directed herring trip. That is a mixed trawl trip where the guy is trying to catch a lot of everything. If the threshold to identify directed trips was moved to at least 10,000, that would be helpful, just get it away from the lower numbers.

There has been a lot of talk about slippage and dumping. I think it would be a very good idea for the observer program to implement protocol changes so that observers ask when they board a vessel if they have any fish on the boat. I have done this several times this winter. I have come in with three trucks of fish, and only two show up. Then, I go back out and catch more and bring three trucks next time. To eliminate concern that some fish are being pumped overboard and not sold, the simple solution is ask the observer to record that information so that concerns about dumping can be eliminated.

There have been some issues regarding an ecosystem approach. It's a great idea, but until the Magnuson-Stevens Act is reauthorized and it is clear that all species don't' have to be at historical levels at the same time, ecosystem management can't work. You would need to fish down stocks at high abundance levels and stay off stocks that are not. Magnuson does not allow the Councils that liberty. My concerns with this approach have to do with predator prey relations. I don't disagree that the herring are not where they have traditionally been, but Area 2 closed, and last year, Area 3 closed for one of the first times. This suggests to me that the fish have moved further offshore east and north. Look at the whole picture. The number of herring that are out there now is going to negatively affect the potential for mackerel to increase. They all eat the same thing. Butterfish, river herring, sea herring, and mackerel are all plankton feeders, and there is not enough out there to sustain everything at high levels.

Everyone says you need 100% observer coverage. I do believe that if it was analyzed, the fleet that fished Area 3 would have about 70-80% range of coverage. Look at the performance of the fleet since the implementation of Amendment 4. 100% may be required for some fleets, but the data should indicate that it may not be necessary across the board. Lastly, the seiners need to recognize that this applies to them too. It's not a gear type. If the seine fleet doesn't have bycatch issues, why should they be subject to 100% coverage. This should be determined by the performance of the fleet over the last few years.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-34

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Friday, March 2, 2012 LOCATION: Samoset Hotel (ME Fishermen's Forum) Rockport, ME

CERTIFIED BY: _____

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
T. Stockwell ✓		
Paul Howard Abs		
Chris Kellogg Abs		
Lori Steele ✓		
Talia Bigelow Abs		
DAVE ELLENTON	GLOUCESTER MA 01930.	617 Box 882
Sean Mahoney	47 Portland St Portland ME	207 210 6439
Rick Usher	89 North Water St New Bedford	774-200-0567
PETE SPAULDING	25 Snowberry Scarborough 02740 ME	207-8380168
DAVE MASON	P O Box 52 WALPOLE ME	207 550/639
DAN SPROUL	120 BEDFORD ST BATH ME	207-449-6819
Rich Bruno	ASA	603 898 TUNA
Barry Murphy	5 Lisle St Rockland Me	207-570-1511 F/V Salem Sea
Shawn Rockett		207-542-1220
[illegible]	Port Clyde	207-372-0628
ZACK KELVER	Bar Harbor	207-460-9575
[illegible]	164 Eaton Rd Warren ME	207 273 2724
[illegible]	6A portland Fish pier	207 415 7503
Pete Douvarjo	358 Chuck Hill Rd. Scituate, MA 02066	207-359-2746
Jim Ruhle	P.O. Box 302 Lamoine ME	

Craig Cyganowski	Vinalhaven ME	542-6270
Mark Bibber	Harpswell	2294510
Hawley	Bar Harbor	
Chris Weiner	Portland	
Barry Gibson	Southbay	633-5929
Arnold Nickerson	Lincolnport	985 2145
Cathy Lindsay	Port Clyde	372 8462
Dick Lindsay	" "	" "
Ted Ames	STONINGTON	367-2708
Capt Mike Brewer	Bath	691-5615
Lisa Kushner	Belfast	3380030
Mary Beth Tooley	Camden ME	
FRANK O'HARA	Rockport ME	
Robert Eagley	Bristol, Me	380-5305
Dana Hammond II	Bristol me	380-9169
KARIN Spitfire	P.O. Box 53 Bxfast	338-5634
Scott McNamara	PORTLAND	780-3822
Karen Ribbins	Rockland/Belfast	436-2025
Roger Simms	Arrowsic, ME	978.946.6687
Lauren Dahl	New Bedford, MA	508-990-9057
Trevor Lyle	Dover, NH	609 439 1502

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Massachusetts Division of Marine Fisheries Annisquam River Station
Gloucester, Massachusetts
March 14, 2012, 7 p.m.

Hearing Officer: Doug Grout
Other Council Members in Attendance: David Pierce
Council Staff: Lori Steele
Attendance: see attached (approximately 60 people)

Mr. Grout introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Richard Prammis, commercial tuna and recreational groundfish fisherman: I would be in favor of 100% coverage in Area 1A and 1B, and to stop the fishing in the groundfish closed areas.

Austin Doher: I am practically retired from fishing. I am here for the observer program. It is a very simple problem if you want to observe. I am talking about the big boats. They go as far as New Jersey and back up. You have million capacity boats working up and down the beach. I think that is great. But if you are talking about management, there is a way to manage, and that is to put people on the boats if you want observers. They don't have to be fishing related, no conflict of interest if you want to do it. I have been fishing 55 years. It's very simple.

I don't understand half of what is in this document. But I know that if you are talking about herring, I wouldn't know the difference between river herring and sea herring, but on my machine, I have seen bunches of herring totally cover my machine. Now in the last years, a little spike here and there. Then I watch them come and put them on shore in Gloucester – 5 inches, 6 inches, 3 inches.

You have an answer for every question but not mine. If you want to manage, it's a compromise between the fishing people and the government people. First, get rid of half the government people. I will never understand this. But I do know the answer for what I have seen. It will probably be another 83 years before I understand where this comes from and why. Management is a compromise between fishermen and managers. It is a livelihood, but that takes two groups to do it. The government, enforcement, and observers. It requires two observers on each big boat, not one. We don't have the money, but we do have the money to put out thousands of pages in these documents.

Steve Weiner, Atlantic Bluefin Tuna Association, Chair of CHOIR: CHOIR is a collation that started in the late 1990s when the midwater trawl and pair trawl vessels showed up in the Gulf of Maine. I harpoon tuna fish. We have to hunt the fish down and look for signs of life. We are looking for where the feed is. It's primarily herring in the Gulf of Maine. These boats went everywhere we went. It felt like they were following us, and to this day, I'm not sure they weren't. Two big boats towing a big net catching a lot of herring. They catch a lot of other fish too. Groundfish, tuna fish, mammals – everything is looking for that herring when we are hunting fish. We started to see tuna disappearing from our waters. At the same time, there was a discussion about the health of the tuna stock. The tuna stock was always very healthy in the western Atlantic. When they swim into an area like the Gulf of Maine, and if there isn't anything to eat, they leave. Right up the road, Canada has had the best year of fishing in the last ten years. I can't say if it's because they banned midwater trawling of herring, but you wonder.

I have been fighting this thing since the late 1990s. I know how the industry thinks, and they know how we think. The reality is that there is a total distrust from the public – our coalition with lobster fishermen, tuna fishermen, groundfish fishermen, whale watchers – there is a total distrust with this gear. When they make a mistake with this gear, it's a big mistake. They say they don't dump much, we don't believe it. I don't believe it. There is not enough observer coverage. 30% trips observed means that 70% trips that are not observed. My experience is that monitoring fishermen is different than allowing them to self-regulate. Observers create change in behavior on boats. The reality is there is about 20-30 boats catching 90% or more of the fish. These are the A and B boats. CHOIR recommends that A and B boats be the focus of the monitoring. CHOIR is asking for 100% observer coverage on A and B vessels.

We are also concerned about dumping. This gear type pretty much pumps the fish aboard. If they have a mechanical failure, safety issue, or dogfish in the net – they are allowed to dump the net. A small or big dragger in New England brings the net aboard as I understand it. You see what's in the bag, you count the fish, and the observer gets to see what's in the catch. There is a concern with the public that as long as the net doesn't come aboard, it's hard to tell what's in the net. Who determines mechanical failure? It might be a legitimate issue, it might not. Same with safety. We have to take this off the table. 100% observer coverage. And we are asking for the provision that after ten dumping events, they have to go home. The problem is that if you don't have an observer on the boats, you don't know if they dumped. So you need 100% observers on the boats.

To me, the most unbelievable thing in the fishery is that these boats have been allowed to tow their nets in the permanent groundfish closed areas. Now we have a real groundfish crisis. Whether that problem is related to this gear, I don't know but the boats shouldn't be towing in those areas. That's the third thing that CHOIR is asking for.

The fourth thing we want is that they weigh the fish. That doesn't mean every fish goes on a scale, but there has to be a formula to allow you to reasonably know the weight that came on the boat is what goes off the boat.

To me, the real concern is the health of this stock. There is a stock assessment is going on now. If anyone has faith in science anymore, we will find out what that assessment says. I can tell you from the fishermen's perspective, and the harpoon fleet – 20-30 guys fishing all summer long, we are all skilled fishermen and we have technology now to look at our machines. And we know there is nowhere near the herring around that there used to be. People that say there is a lot of

herring around must be new to this area. The herring that are around are on the bottom, which is weird. These are older, smaller fish. Why are the fish smaller? They are spawning at a smaller size. Is that fishing pressure?

Underlying this with me and most of the members of CHOIR, we are small fishermen, we want coastal communities survive. This is the worst decision to allow this gear type in the Gulf of Maine and Georges Bank.

Roger Bryson, commercial handgear fisherman, recreational fisherman: I have been fishing for over 30 years. For a lot of years, we would watch the herring come in during October and November, inside Boston and Salem. You used to be able to just look around for bait and jig it up. It was a regular routine. We rebuilt the cod fishery before. It took a long time, and it worked. The fish came back. Then, we had a big meeting to allow the beginning of the midwater trawling. So I asked if now, we are going to let the foreign boats come in and get all the bait. Now, we are in the crisis again because of that. Too many herring are being caught. I don't see the fish anymore in October and November like I used to see. You get a handful of guys that are going to make decent money, and it is going to wipe out the whole fishery. It has a big effect, and it's hard to control. It was a problem from the beginning, and now we are trying to regulate it.

When you are trying to recover a fishery, bait plays a big part. The cod, haddock, pollock – you can't separate it. If you remove a lot of bait, you disturb the whole thing that is going on. I don't want to stop people from fishing, but especially in closed areas, it was problematic from the beginning.

Regarding the tuna – we used to go on Jeffreys year after year. The bait would show up, and then the tuna would show up. Depending on how much bait was in the area would determine how much tuna would reside in the area for the summer. We get a few fish, and now when the midwater trawls come in, they would take a bunch of fish out. Then, there is not enough bait, and the fish leave. We hardly have a fishery at all. It changed the whole fishery. Do whatever you can do to make it better for everyone, not a handful of guys making money, but all of the fisheries from Maine to the Cape.

JJ Johnson, engineer on midwater trawl vessel: I have been a fisherman in Alaska and Russia as well. I was up at the Gulf of Maine Aquarium, and we were watching a size-at-age study saying the herring are getting smaller not from fish pressure, but they are going hungry.

Most evidence with herring that I have seen speaks to a lack of plankton. That's the new science that is coming out. People are wondering why fish are getting smaller. Perhaps some science would help rather than guessing. I have been listening to the same accusations for years without proving any of them. There is a mountain of observer data, and it all says the same thing. Herring fishing with midwater is a clean fishery. We have proven we can fish cleanly in the closed areas. We can stay away from most groundfish except haddock. I have worked with the observers. They all say the same thing. They don't know where these accusations are coming from. This document is the result of a lot of unproven accusations. There is a mountain of evidence refuting those accusations. I would appreciate it if some of that evidence would be published.

Looking at the observer data, you can see that the elimination of midwater trawl fishery leaves the bottom trawl fishery. The environmental impact would be more marine mammals killed, more protected groundfish being killed. The alternative to midwater trawling is not seining. If we would be fishing with bottom trawls, we would be killing more groundfish and marine mammals. That is documented.

As far as the document is concerned, I favor the status quo for most of it. I sat in on the Herring Advisory Panel. And I have seen that this is the result of an agenda and ten-year campaign to ban or severely restrict trawling. My number one concern is those Council members who have taken money from campaigns to ban or restrict trawling and promoting bottom trawling and leasing quota to bottom trawlers. I would like to see them recuse themselves. If you have taken money to ban or restrict a fishery, then your input to that fishery can only be seen as designed to fail management.

Steve Pearlman, Coordinator Watershed Action Alliance of SE Mass: We represent 11 watershed associations from Dorchester Bay to Narragansett Bay. These rivers have historically been herring runs and there is very little left of those runs. A number of our organizations are trying to remove dams and other barriers to fish passage, but we are still not seeing a large return of herring.

We would like (1) the strongest monitoring possible, which includes 100% monitoring of A and B vessels and a system that discourages dumping so that everything is counted. (2) We would also like to see immediate caps on herring catches and eliminating fishing in the groundfish areas.

Mark Godfried, Gloucester MA: I am going to raise something that NMFS should have addressed in this document. There would be more herring available to all user groups if NMFS would stop thinking about the National Standard that requires them to consider competitive predators with our fish stocks. We have an uncontrollable population of pinnipeds. Seals are removing about 40 million pounds of herring per day out of the biomass in the Gulf of Maine. Somewhere in these plans, there has to be a way to reduce this population. We went from 0 seals at Monomoy to over 3300. We have a case of worm infestations. Every cod we catch is loaded with worms. Someone needs to address the fact that we have about 7 million of these things now, and they are like rats with fur.

Tommy Scanlon, charter boat operator Boston MA: I charter for stripers, bluefish, and groundfish. The sight of mile upon mile of striped bass floating dead behind the pair trawlers a couple years ago got my Irish up. The striped bass fishing community is very concerned about the lack of stripers, although they had a good breeding season this year. As a striped bass fisherman, I am concerned that these clean pair trawl vessels are indiscriminate in some areas where they have no business fishing. I don't know why you cannot distinguish between a school of striped bass and a school of herring.

This year, you say haddock is overfished and you want to reduce my charter parties' haddock catch. You know that the pair trawlers are always picking up haddock as a bycatch. They either dump them, or the small ones get mixed in with bait. I am also familiar with a community on the Saugus River, which used to have over 100 boats lobster fishing. Now, there are maybe 18 boats in that fleet. A lot of factors have caused it, but primarily it has been lack of bait. Bait in

the lobster fishery has been herring and pogies. Pogies disappeared so they went with herring. The herring prices get higher, fuel prices get higher, and the fleet goes away. I am also a member of the Stellwagen Bank Charter Boat Association. We want 100% observers on board any and all of the pair trawlers. I don't believe that this is a clean fishing industry. If you are purse seining, you can bring up the purse, you can see the fish, drop it, and 99% will swim away. I don't see that in the pair trawl industry. They have not made any friends in the other fisheries since they started here.

Carmen Lee, Gloucester: I am a concerned citizen from Gloucester. I have been following the issue of industrial trawling and the impact on herring populations. The more I learn, the more alarmed I get. What's happening now with inadequate monitoring, unmanaged river herring catch, dumping catch at sea – these don't make sense to me. I am in favor of greater accountability, greater transparency, and greater oversight. I don't think it is too much to ask for 100% at-sea monitoring, for an immediate catch cap for river herring, and for a requirement to accurately weigh all catch. I feel that this is one of those silent issues that don't make the headlines but will impact all of us in Massachusetts.

Shane Yellin, recreational fisherman: I think we need 100% observer coverage. There is way too much change when people know they are being watched. We also need a cap on the bycatch. It is unacceptable for big midwater trawl and bottom trawl boats to be catching all this river herring when they are in need of recovery. Net slippage is uncontrolled. Captains can dump whenever they want, and it is easy loophole for them. They should only dump when it's an emergency, and they should have to report them.

I have seen videos with what looks like 3 miles of dead stripers floating on the surface behind the midwater trawl vessels. It is terrible. If you are going to fish a giant net that covers most of the water column, and you are fishing for the bait, the predator fish follow the bait. It is way too large of a fishery, too efficient, and it doesn't give the fish a chance.

Also in the last few years, there has been a decline in the health of the striper fishery. Most of it is due to malnutrition, and I know most relates to menhaden. But river herring used to be a major forage food for them. The herring runs near where I fish have dramatically been depleted and we need to do whatever we can to help them rebound.

I would like to see midwater trawlers banned from closed areas. If we are trying to protect a fishery, we shouldn't make exceptions for one type of fishing versus another.

Brian Kelder, Ipswich River Watershed Association: We are a non-profit to restore the natural resources on the Ipswich River. One of our focuses is restoring diadromous fish runs, especially river herring, to sustainable levels. I work on a river that once supported millions of river herring, and now we have a couple hundred to a couple thousand fish coming back each year. We are working to restore the river's capacity by reconnecting habitat and improving water quality and quantity. We are working to remove dams and open up habitat in the freshwater portion of their life cycle.

As we continue to address this, we ask the Council to support our efforts by approving stronger protection for river herring when they are at sea. We support 100% monitoring on all midwater trawl trips and measures to discourage wasteful dumping, slippage. We would support an immediate cap on river herring catch.

Jay Shields, Beverly charter boat captain: I think that anything we can do to enhance the health of the ecosystem is a good thing. When we are dealing with a bait fish like herring, I understand that your job is to ensure viability and yield simultaneously. The best way to do this is by retaining robust populations of a nutrient-dense prey like herring.

From my experience on the water, these vessels are the most indiscriminate that I have ever observed. You can visualize it. There is always predator-prey interactions going on out there. There is very rarely unmolested schools of herring. To think that these boats could operate without tremendous levels of bycatch is absurd. I view these proposals as beneficial for gathering better data. Ultimately, this will create a better ecosystem.

I am in favor of 100% observer coverage and close the restricted area for these vessels. They say they are a clean fishery. The only thing they do is clean out the ocean. Anything we can do to make it more difficult for them to destroy the basis of our ecosystem will benefit everyone.

Fred Jennings, MA State Co-Chair Stripers Forever: We have 5,000 members in MA who are recreational anglers and about 17,000 along the coast. I feel that I speak for what was five or ten years ago 500,000 recreational anglers in Massachusetts alone. In five years, the striped bass recreational catch is down 84%. We are very concerned about the health of the fishery. The economy is threatened. I strongly urge you to place restrictions to protect river herring, which is important forage for striped bass, and 100% monitoring of bycatch, which is also a problem for striped bass.

Nat Moody, First Light Anglers: I run a charter business and tackle shop out of Rowley, MA and Gloucester. I think that the line between operational discards and slippage needs to be very clearly defined. If there are restrictions put on slippage, it will often slide in to operational discards. I don't know how you can deal with this but this is important issue that needs to be addressed.

I am concerned that fish from 1A migrate to Area 2 in the winter time. We have seen the huge recent landings out of Area 2 late in the season. I am afraid that Area 1A fish are being double taken.

I would also like to support 100% observer coverage A and B vessels. I would also like to support closed areas remaining closed to all of these vessels.

Joe Jancewicz, Kensington NH, BOD American Bluefin Tuna Association: Today, I will address the pink section – catch monitoring at sea. I don't believe that there should be any net slippage. If there is net slippage, those dead fish get counted against no one's quota, none whatsoever. If you catch it, you land it.

As far as weighing these fish, it is a hard TAC fishery. How do you manage a hard TAC for fish that are not weighed? It's all estimates. Maybe we should start estimating the groundfish fishery.

Midwater trawl access to groundfish closed areas – the purple section. I have been a scalloper, a dragger, a groundfish fisherman. It bothers me, when you see the boats haul back, that the ground gear is shiny. There are no abrasives in the midwater column. That ground gear gets shiny by dragging on the bottom of the ocean, whether it's sand or gravel. I don't know if they

have rockhopper gear, but I am sure they probably do. I have seen these guys haul back, and I have seen the shiny gear. They should stay completely out of the closed areas. Other people can't go there, so these boats shouldn't. They are called midwater boats, but I beg to differ.

As far as observer coverage – 200% coverage – one man awake at all times.

Mark Vona, charter fisherman, Beverly MA: If there is 30% observer coverage, that means there is no one on the boats 7 out of 10 times the boat leaves the dock. Maybe people behave better if there is someone on there. But if there is nothing to hide, let's get more observer coverage.

Regarding the weight of the fish, if we are three fish over the limit, we face a fine. And these boats come in and estimate the tonnage. Just put everything out in the open. They can make the argument and say there isn't enough coverage, there isn't enough data, give us more and delay things. We need to get more observer coverage, and we need to actually count what comes off the boat.

Tyler McGlaughlin, commercial fisherman, Rye NH: I think it's completely absurd that we don't have 100% observer coverage on these vessels. The destruction and their size, due to the fish that they are chasing, are not compatible. We are talking about boats that tow nets between the two of them and fish between 8 and 14 inches. How is that fair to the species? I have seen it myself since I was 16 years old, and now I am 24 years old. I have seen the ocean go from red out with tons of herring to me having to go miles and miles to find bait.

They should not be able to fish in the closed areas. Other boats can't do it, so why should they?

Peter Mullen, Gloucester MA: I own two midwater trawl vessels and a purse seiner.

It makes me sad to hear the amount of lies spoken here this evening. We had 75% coverage in the groundfish closed areas. How much more do we have to have before people start to believe us? I hate when people get up and lie that there was three miles of stripers that a midwater boat dumped. Show us the proof.

A few years ago, 90,000-100,000 tons taken out of Area 1A in the Gulf of Maine. Now it's down to 26,000 tons. Of that, somewhere between 15 and 20% is taken by midwater boats at the end of the summer. There is plenty of herring in 1A. We went 20 miles out the other day and there was tons of herring.

Down in the MudHole, in the upper reached of Hudson Canyon, right now, there is 40 miles of herring 20 fathom deep. If you made a set with a purse seine right now, you are talking about probably 2-3 millions of tons of fish.

As you know, there is a groundfish problem now. A lot of it was bad management. Boats went out catching codfish and dumped it over the side because of trip limits. Then, something happened with the sectors, but I can tell you that there were millions of pounds of cod dumped over the side. Nobody said a word about it. All the codfish, haddock, and flatfish are going to spawn soon. That's the same time that you will have 2 million metric tons or more herring come through. When they come through, and they are starving, if you think that they are not going to eat all the cod, haddock, shrimp and other spawn that is in the water column, you are making a mistake. You will never rebuild the cod or other stocks if you don't balance the ecosystem.

Everyone is firing at midwater trawlers. Midwater trawl vessels take about 15-20% of the available herring out of the GOM in about six weeks at the end of the summer. We have spread the wealth around, taking fish from Georges Bank, south of the Cape, all the way down to New Jersey. It isn't all concentrated coming from Area 1A.

We have no problem at all taking 100% observer coverage once we figure out a way to pay for it. We can't pay east coast prices. We can probably afford west coast prices, and that's about $320 a day. And I think the government should help us out with it. We will do it to clear our names.

Chris Weiner, bluefin fisherman, ABTA, CHOIR: I disagree about the amount of herring. I am at these meetings because I don't think that there are enough herring out there.

This year, you could drive to the shore and watch the whole fleet catching way more than 15-20% of the 1A quota in the one area we had herring all summer long. Every tuna caught off Maine, almost, this year, was caught within 20 miles of Portland. The second that fishery opened up on October 1 – the same thing happens every year. This year, we had one area of herring, maybe two. The boats came into the area that we fished all summer long and took about 20,000 metric tons in about three weeks. That's not healthy. I agree that the government should put more money into this because this is really important. I support what I said at the last meeting.

Dave Ellenton, Cape Seafoods, Western Sea Fishing Company, Gloucester MA: Western Sea Fishing Co. operating three midwater trawl vessels in Gloucester. I am going to send in written comments.

But I do want to confirm that we have a consensus with a large percentage of vessel owners in Categories A/B/C. We will totally support 100% observer coverage, and we will support paying for those observers at a reasonable rate in comparison to the reasonable rates on the west coast. $325 a day is the rate that we are talking about at the moment with Category A/B/C vessels.

(Audience member asked a question about federal funding for observer coverage.)

JJ Johnson: Publish the observer data in an understandable format for the general public, and then we wouldn't have to listen to the ignorance. If you are going to have 100% coverage, stall the tax payer out and publish the data, help the tax payers out. They are paying for it.

Vito Calomo, Gloucester MA: I heard some interesting comments from the public tonight, something about foreign fishing on herring. I want to clarify that there haven't been foreign vessels for twenty years. I was instrumental in getting rid of foreign vessels in this fishery.

What other fishery on the eastern seaboard or just in the Gulf of Maine has as much coverage as these vessels have?

When we have observers and we are observing the herring industry, why aren't there observers on purse seine vessels? They are catching herring and have bycatch. It should be fair and equal throughout the range, whatever the percentage is.

Peter Mullen: Most countries in Europe measure the tanks. Then, the observer comes down and dips the tank, put a weight down and the weight sits on top of the fish, and then write the measurements down. That goes to a database and they know exactly what comes off the boat. It's about 98% accurate. A lot of boats already have their tanks measured. It's a simple way to do it. The observer on the trip could drop the weight when the boats hit the dock, write the numbers down, and someone else could analyze it. The observer doesn't have to say how much is on the boat.

I'm not sure if NMFS can ever figure it out. We call in every morning and tell them how much fish we have, and yet we still went 1,500 mt over in Area 1B this year east of the Cape. I don't understand how that happens.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-45

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 14, 2012 LOCATION: MA DMF, Annisquam, Gloucester, MA

CERTIFIED BY: Lori Steele

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
David Pierce ✓		
D. Grout ✓		
Paul Howard Mtg.		
Chris Kellogg Mtg.		
Lori Steele ✓		
Talia Bigelow Mtg.		
R/C Peabody	16 Chubb Peabody,	978-531-5356
Paul Lacerra	Ipswich	978-478-5468
Nathaniel Moody	25R Apple St Essex MA 01929	978 808 2578
JOE JANCEWICZ	5 MUDDY POND Rd. KENSINGTON, N.H. 03833	603-772-9505
Collin MacKenzie	6069 Western Ave Gloucester, MA 01930	508-312-3364
Chris Weiner	Portland	
Steve Pearlman	2123 Washington St Canton MA	781-575-0354 x304
Brian Kelder	PO Box 576 Ipswich MA 01938	~~781~~ (978) 412-8200
Carmen Lee	188 Hesperus Ave, Gloucester MA 01930	978-526-1471
GREG WELLS	59 TEMPLE PL #114 BOSTON 02111	617 725 0300
Katharine Deuel	18 School St. Unit 2 Beverly MA 01915	978-969-2259
JIM DEUEL	18 SCHOOL ST #2 BEVERLY MA 01915	978 350 0380
ALLISON MINOTT	15 WOODCREST. No ANDOVER MA 01845	978 666 2968
DAN FRANCIS	34 ATLANTIC ST GLOUCESTER	978-500-0755
Al Williams	5 Orchard Way Gloucester, Mass.	978-281-1977
VITO J CALOMO	82 Holly GLOUCESTER MASS	978 281 5963

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-45

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 14, 2012 LOCATION: MA DMF, Annisquam, Gloucester, MA

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
RAY CLEARY	4 HIGH RIPPLES GLOU	978 559 1344
Frank Colletti	15 New Way Lane Glou	978-325-9540
BILL MONTE	8 WITCHCRAFT RD SALEM MA	9788278004
Tom Scanlon	15 Locust St Lynn	781 955-1131
FRED JENNINGS	P.O. Box 946, IPSWICH	978-356-2188
Peter Bratchie	79 Pleasant St Wenham MA	978. 532 6666
Michael Cornell	23 Blueberry Rd Marblehead	781-3987074
Manny Pereira	23 Parsons St.	(978) 479-0495
Ed Pereira	23 Parsons St	(978) 479-0495
MICHAEL LORUSSO	PO Box 774 OGUNQUIT ME 03907	207 646 9025
TYLER McLAUGHLIN	77 MAIN ST. HOLLIS NH 03049	6038609010
TJ Johnson		425-876-0230
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	10 D LUCITANIA AVE GLOU	413-717-3548
Steve Corbett	15N Plum St. Glou. MA	978-764 2265
Mark Vona	111 Water St. Beverly, MA	781-592-5362
Rob Vincent	[illegible]	
Anthony Calvario	2 Chadwick Circle Mo 01906	6178774555
Shaun Mellin	4 Clearview Dr Dover MA 02030	617 [illegible] 4128
Tristan Castrichini	7 Ravine Rd Winchester Ma 01890	781 484 8278

MID WATERS SUCK

AD DELUCIA 25 [illegible] [illegible] MA 978 474-[illegible]
John MASIZ - 21 High ST Tewksbury MA 978-[illegible]
Steve Weiner - 12 Judson Rd, Andover, MA 978/764-3687

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Sheraton Harborside Hotel
Portsmouth, New Hampshire
March 15, 2012, 7 p.m.

Hearing Officer: Doug Grout
Council Staff: Lori Steele; Talia Bigelow
Attendance: see attached (approximately 60 people)

Mr. Grout introduced Council staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Michael Blanchard, groundfish fisherman, bluefin harpooner, Gloucester MA: I will submit comments in writing. I am speaking tonight as a member of CHOIR and ABTA and a number of other organizations. It's been a long five years. There has been a lot of rocky road, and five years later, it's not any smoother now than when we started. If anything, it's gotten worse. The four points most important points to us are:

1. Require 100% observer coverage – Just having 100% observer coverage in and of itself will alleviate a lot of questions for obvious reasons. If you have someone on the boat all the time, everything will be observed and we'll know what's going on. It is a very valuable fishery monetarily to the industry, as well as the other people and the whole ocean that relies on herring.
2. Second is to prohibit midwater trawlers fishing in groundfish closed areas. It doesn't make sense to have a midwater trawl boat fishing in a groundfish closed area. We now know that they are quite capable of catching groundfish. We have had massive interaction with haddock so much that the Council had to up the TAC that was allowed for the take of juvenile haddock. We would like to see the elimination of midwater trawlers in the groundfish closed areas.
3. Third is accurately weighing the catch. It's hard to believe we can put a man on the moon, but we're going to assume or take someone's word for how much weight of fish they think they caught. We have scales, and in other areas, we have accurately measures and weighed total catches for fishes much like herring. If you look at the Pacific Northwest, the fish are accurately weighed, and that is an important thing to us.
4. The last issue is slippage – it's the termination after 10 events in a given management area. I personally like five events and disincentive of 100,000 deducted from the catch. I think 10 events is too much. But it will at least dis-incentivize the boats and give them a reason to

stay away from a potential dirty set. Or if they are having trouble with the pump, get in and get the pump fixed. We do know for a fact that with midwater trawling, there is no opening the net up and letting the fish swim away like there is with a purse seine, for the most part. If the fish are feedy, if they are small, if they are not herring, they open the net up and the fish swim away.

It has been a long five years. We would like to move forward, and these are the most important points for CHOIR.

Don Swanson, Coastal Conservation Association of NH: Mr. Swanson read a written statement into the record (see attached).

Dave Goethel, Hampton NH: I am a Council member, but I am speaking as an individual who has fished for herring for 28 years. I have a Category C herring permit. This is my only chance to speak on behalf of my own business.

First, I think the entire document should be split between A/B boats, which is the directed fishery, and C/D boats, which are basically incidental catch in other fisheries. Some of my comments may be confounded because I have to assume that the document may stay as written, which a lot of times includes C and D vessels. But I will try to make delineations.

Regarding observers, I don't think you need 100% coverage. I think that you will find the same results with less than 100%. There is a penny exercise we do in the Marine Resource Education Program, which shows that you don't need a census. You can get the same result with less coverage. I think you should consider that because of cost. If you do have 100% coverage, you should have a sunset clause – 100% for a couple of years. Get a baseline, and if you find that you don't have issues that a lot of people think you have, then it goes away. This is incredibly costly no matter who pays. If the goal of having 100% coverage is to get rid of the herring fishery, then let's just have an option to get rid of the fishery. Because requiring 100% coverage on C and D boats will get rid of the herring fishery.

On the trip notification requirements, I think it should be changed to something less than 72 hours. For groundfish, it's 48 hours, and I think that's too long. I don't understand why observers can't be deployed in 24 hours or less. 72 hours is three days. For someone like me who goes every day, that means I am on the phone constantly. That's just unnecessary.

I don't think that there should be any change to the transfer at sea rules – status quo, no change. Option 3 transfers only herring permitted vessels is unenforceable. The Enforcement Committee already said that. Option 2 A and B vessels only is discriminatory. Are they better at reporting than C and D vessels? Or is this an attempt to zero out the people that do most of the transferring?

It is easy to say you should weigh the fish. I think you should come up with volumetric measurements and convert them to weight. For example, a standard tote weighs 100 pounds or 110, just pick a number and that's what we will report. The same can go with grey tubs – 1,000 pounds, whatever it is. It's a perishable product, and we can't be sitting around all day weighing it in the hot sun. It rots. I don't see what the issue is here. Another issue is how you are going to weigh when you pump them into trucks. When the fish get pumped, there is a lot of water in them. You need to consider this from a logical point of view and get to a number everyone can agree on.

River Herring – this is the one that I have a real problem with. Overall, I think you should split it between A/B and C/D. If you don't split it, most of these options will basically close the fishery to people who cannot leave an area. When you close an area to the A/B boats, they will move because they can go anywhere. The C and D boats are mostly day boats and are limited geographically. A lot of them are limited by the rules in other fisheries. For example, I operate in the whiting fishery. We have area 1, a small area in Ipswich bay. If any of these measures to reduce herring bycatch are triggered, the event could occur off central Maine, but the area that would close would be off Ipswich Bay. It doesn't make sense. The people who pay the price are the people who have the least impact on the resource. If you close Ipswich Bay September, October and November, we can't fish. That's the only place we are allowed to go. I don't think that we are responsible for creating the river herring problems since we have been fishing there for over 100 years, and this problem seemed to just pop up over the last ten years. Whiting boats are limited to time and area. We catch herring in the whiting fishery.

I also hope that the Council will consider exempting the shrimp and groundfish fishery. It is the height of irony to me that we would close fisheries with mesh bigger than 5.5 inches. And the shrimp fishery uses a grate and doesn't have much impact on river herring. The river herring has largely left that area by the time the shrimp fishery is open.

On the groundfish closed areas, I understand the sentiments, but I remind people the law of unintended consequences could apply. If you move them out of a groundfish closed area, you could put them into areas with higher concentrations of groundfish. The groundfish areas will change with time. A lot of the closures we have now are combination groundfish /habitat closures. The habitat closures are likely to change, and the groundfish closures may too. If the Council does vote to keep them out of the groundfish closed areas, make sure that it is constructed in a way that you can move the areas in the way that you can move the areas based on how the groundfish actions move those areas around so that there isn't a mismatch.

I would support, as a logical way of dealing with this issue, 100% observer coverage in the closed areas. That would be a more logical way to approach this. I think you would find out if the problem is real or perceived. Since these boats fish inside and outside of the areas on a given trip, if you require 100% coverage, they will either not go into the areas, or they will have an observer for the whole trip.

I think there are a lot of modifications that need to be made to what's finally done here. I think most of these measures would be considered the most restrictive alternatives, but the Council can, and I hope would modify some of these to make them less costly and get the results you would desire, which is accurate monitoring.

Keper Connell, Rye NH: I am a participant in lobstering, tuna fishing, and charters. Herring is fundamental. Regarding observer coverage, I believe it that for the A and B boats.

Also, regarding Closed Area Access, I would disapprove of that and I question how they got access to the closed areas.

Regarding the slippage – how are the slippage numbers set?

The ecology of the Gulf of Maine is fundamental with herring. If we don't have herring, we don't have anything else.

Chris Weiner, ABTA, CHOIR, bluefin fisherman: From the get-go, this was never about C and D boats. Somehow they got figured into this, but it was always just about the A boats in my opinion, and only about half of the A boats. Through a number of ways, certain lobbyists were able to figure the C and D boats into the process. And now, we have this situation that we worried about, where small draggers and small boats that were never intended for this are being brought into the process. This is about the 20 big pair trawlers. That's what this is about. I really hope the Council will focus on those. You need to split them off. There is no reason for a boat like Dave Goethel' s to be included with a 160-foot pair trawler.

With the big A and B boats, you have to have 100%, and that's not too much to ask. Show me another fishery in this country like those boats that doesn't have 100% coverage on boats. It would be great to have 200%. That's the only way you will really get it. We are not asking for that, but when you are on a four-day trip, when is the observer supposed to sleep. In other areas, that's what they have. I don't see how it's too much to ask to put observers on big boats like this. Yesterday, we heard that there is some support for 100% coverage from the industry, and that has us wondering what that is all about. My concern is that there is some support for that, but there will be a big fight on the dumping issue, which is critical. Everyone knows that dumping is going on. If you get a big bag – on the northern end of Jeffreys once, one of the boats we know dumped a mile log of herring with cod and seals mixed in, and the observer report afterwards said "mechanical failure" – that's pretty convenient. You need to fix that problem. You need 100% coverage, and don't even think about putting it on C and D boats. What will end up happening is that you will get nothing out of it. There is a room full of people here that show you that something needs to be done. So focus on the boats that people are worried about.

Tyler McLaughlin, tuna fisherman, Rye NH: I agree with Chris said. When you talk about a clean fishery, midwater trawling is not a clean fishery, midwater trawlers just clean out the ocean. I support 100% observer coverage. 200% would be better because what are you going to do when a guy is sleeping.

We need better oversight. There are interactions with mammals and tuna fish on a common basis. That's not right for any boat. The small boats and the C and D boats don't have those interactions with mammals.

We need to weigh the catch. In the tuna fishery, we get hit hard with dead discards from the offshore swordfish boats. Why does that not apply to the herring fishery.

We need to ban them from closed areas. If other boats can't access those areas, why is it that they can?

It's not too much to ask for boats those size to have 100% observer coverage It's the right way to do it and it's only fair. If they are having interactions with fish they shouldn't be, why isn't it recorded?

Michael Blanchard: I want to clarify my previous comments. I wasn't specific about 100% observer coverage. That would be for Category A and B, not C and D boats. Also for the Category A and B boats was the 10 slippage event provision.

Patrick Paquette, RFA New England: (asked a question about 100% observer coverage – defined as one person per trip or every haul observed?)

My understanding is that pacific pollock refers to 100% observers, and that means everything needs to be watched. That makes 100% mean that everything taken out of the water is watched, that's what we are supporting.

(asked a question about monitoring quotas and in-season quota adjustments)
The overage this year in 1B was a significant amount of bait, and it cost us a lot this year. It's a lot of natural resource to be missing.

Mark Pourier, Stratham NH: I have been involved in fisheries management for over 40 years now. What I find interesting is the addition of the C and D boats into the A and B boats. We know that the problems do not lie with the small day boat fishery.

The euphemism "slippage" troubles me. I used the word "fraud" earlier. Without 200% observer coverage or perhaps even 300% on a four-day trip, we are not seeing everything that is happening 24 hours a day seven days a week. There are cameras on the nets. They know. As a spotter pilot for bluefin tuna industry, I have seen massive shoals of herring disappear when these boats come into an area. Yet they are allowed to do a 50% overage. There seems to be no discipline. In every other fishery, you go over, and you get dinged. These guys don't seem to get dinged. It doesn't make sense. You touched on a measure that is going to happen. We hear "going to," and "might," it happens a lot in fisheries management. Those of us, these guys here, everyone is tired of it might, it may, we hope. It gets old, and that's where the frustration lies.

From a 10,000 foot view, I see these fish are the foundation of every fish that's out there – codfish, haddock, tuna, striped bass, whatever. We are undercutting the foundation. You can't build a house without a good foundation. We aren't watching what happens. Apex predators are moving elsewhere. Fish have tails. There is a reason we are fishing tuna on Georges Bank July-November. These boats shouldn't be there. We have destroyed the inshore fisheries for every apex predator because we are killing the bait. Until we look at how are supposed to build well-run ecosystem-based fisheries management, we are wasting time. This is something people ignore. It needs to be put into the record that we aren't going anywhere until we address this issue. I hope that you will do something about that.

Jim Dufresne, commercial tuna fisherman, Hampton NH: If you take A/B boats and C/D boats, you are comparing apples to oranges. I am not concerned about C and D boats at all. I have fished amongst them. They do their own thing. Having been anchored up and seen A boats come through to drag the ocean, it's clearly a different game they are fishing. A lot of the provisions that have been supported by people in this room are not too much to ask for operations at such a level. Look at the smaller day boats, they have tight budgets, they are gentlemen putting food on the tables for their families. We are talking about large corporations that have astronomical fuel bills to run boats of that size. To ask for some extra oversight is not too much. It's a different game they are in. It's not too much to as for something as helpless as the herring.

Steve Weiner, ABTA, CHOIR, harpoon tuna fisherman, Ogunquit ME: It's important to understand that there is a room full of people here. We have come to meetings for years saying we represent hundreds of fishermen. The fact that they are in the room here – they are filling the rooms. Not all will speak because it's tough to do.

I grew up harpooning the Gulf of Maine. We had purse seine vessels around forever and never had a problem with bait. When the foreign boats were offshore, they drove our herring fishery into the bucket. And it came back. And this is the first time we have had that same kind of effort. They caught more then, but it's the same type of gear, the same type of efficiency, and it's the same type of risk. There isn't a person in the room that wants a fisherman out of business. This is different. These boats have a capability that none of the other boats have. The only boats that have this type of capability are boats on the west coast and in Alaska in this country. And they all 100% or 200% observers, and most pay for their observer coverage. But that's a tricky thing because there are on-the-water costs, off-the-water costs, overhead costs.

One of the things we have to do is find a way to make the observer costs less. We spent some time looking into those west coast operations, and we have gone out and gotten some pricing, and the reality is that I think you can do it for less. One of the reasons we need 100% observer coverage to address the potential for a big event. If you stand up high and look at what's going on, you have a major forage fish in the Gulf of Maine. Everyone is chasing the herring, and to think that these boats are going to tow around through the forage and not get other fish doesn't make sense, whether the observer coverage shows it or not. That's what makes me the most suspicious – when I hear that the observer coverage says that there is no proof that these guys catch codfish. It's crazy. These nets can tow right on the bottom, right to the bottom, and right almost to the surface. To think that these guys are going to tow a net to chase herring around and not catch codfish, haddock, striped bass, not catch bluefin tuna. I would think that bluefin tuna would be one of the hardest things to catch in pair trawl, but they do it, consistently. They did it in Rhode Island numerous times this winter, in January.

I am also worried they fish differently when there are no observers on the boats. I think that the coverage is about 30%, which means that 70% of the time, there is nobody on the boats. I think they will fish differently when there is nobody on the boats. When there are people on the boats, like Closed Area 1, the industry says look, we have proven with 100% or 80% coverage offshore, we are not catching any other fish. I think it proves what we are trying to say, which is when you put people on the boats, these guys know how to fish cleaner. They are fishing cleaner today than when they first came in here, but I believe they do it when there are observers on the boat. A and B boats is all we care about. All I care about is the midwater trawlers – pair trawlers and single trawlers. The A and B boats catch about 97% or 98% of the quota. We need to control the boats that catch about 97% of the quota, which I think may be 20 or 25 boats, no more than 20 or 30 boats catching that 97%. Personally, I am disappointed that we have to put it on the purse seiners, because I don't think that these hearings would be happening and the people would be in this room if it was a purse seine fishery.

I want to reiterate that I support 100% observer coverage, and I do believe they should not be able to fish in the groundfish closed areas. If those groundfish closed areas change, then it should change. They should not be allowed in those areas. The groundfish fishermen have been suffering for a long time, and now they are suffering more. If you can't catch groundfish in an area, shouldn't tow these nets through it.

There needs to be some way to dis-incentivize dumping. The dumping is what drove most of us in this room. A lot was localized depletion, but we are very concerned about dumping. CHOIR came up with a lot of ideas that were shot down, maybe rightfully so. The first one was maximized retention – whatever you catch, you bring in. I think that it may be the best thing in theory, but difficult and I guess impractical. I'm still not convinced that's not the right thing, but it's gone now. The reality is that there needs to be something that keeps these guys from dumping. I am sure there is true mechanical failures, and true safety issues, and times you catch dogfish, but a lot of times, that's just a loophole. We started with one dump means trip termination, and the Council shot that down. So we tried to adapt and got to the five and ten trips so there is some penalty and disincentive.

As far as the weighing goes, I agree that you don't have to weigh every pound of fish but if there are 20 totes on a flatbed truck, and they are all the same tote and weigh 2,000 pounds apiece, then you have 40,000 pounds on that truck. There needs to be a simple way to get to a weight. The idea is to monitor the fishery, don't let the fishermen report to us. There needs to be a method of monitoring the fishery.

I am impressed with all of the people who are here today, but if you really want to make a point about why you are here, then stand up and make a comment.

Tim Virgin, tuna fisherman, Ogunquit ME: I support 100% observer coverage on A and B boats. I agree that the A and B boats are the biggest issues here. The small boats supply local bait needs, and it's a good fishery.

I think we'll be surprised if we really look into how many river herring they catch. I think it's a lot more than has been reported.

I think you have to address slippage I support five incidents of slippage for trip termination.

Jeremy Loomis, Portsmouth NH: I agree with 100% observer coverage of the larger boats. I think there are other ways to get to 200%. I don't think it will be effective if we don't have overnight coverage. There is technology out there – cameras, time lapses, all kinds of different ways we can try to capture that other side when someone is sleeping.

The A and B boats need to be separated from C and D boats in this legislation.

The big boat waste is very alarming and needs to be accounted for. I understand it's a sticky situation, but it's a waste, and it's sad to see it happen.

Chris Adamaitis, lobsterman and part-time tuna fisherman, Portsmouth NH: I agree with 100% observer coverage. I know smaller C and D boats that go groundfishing. I see an observer on the boat every few days. Those guys are out just trying to make a living. The A and B boats are out there cleaning up the whole bottom. I have seen first-hand what goes over the side, and I totally agree with 100% coverage on the A and B boats.

Bill Neelon, whale watch industry: I agree about the damage being done by the big boats. I run charter boats and commercial fished for 30 or 35 years. As a whole, the herring are the lifeline of all the fish – tuna fish, big fish, and the whales. We see it first-hand when those boats come in. We are not here to put any fishery out of business, but we did live with purse seiners. There was never an issue. We never had shortages of anything, and whales were all over Mass Bay and Ipswich Bay.

For the past 10 or 15 years, we have fought this hard. We can tell the whales apart. When they go, we know where they are going, and they are going over to the Bay of Fundy. They are going to Nova Scotia. We get reports back on a daily basis. It's not that far. It's 200 something miles, and they will be there in 24 hours. If there is no food for them here, that's where they end up. Once the boats come in and fish it hard, it's a month before we see whales again. Any whales we see are just transit whales.

I think we need 100% coverage. We have seen what happens. When you walk the docks when the midwater boats are tied up in Gloucester, you see shiny chains. I don't know midwater fishery that comes up with shiny chains. I don't know what's abrasive in the water.

There should be 100% coverage. It will hopefully keep everyone honest. I think it has to be with the big boats. It's not the little day boats, so there has to be a definition in there somewhere.

Erik Anderson, Portsmouth NH: I would like to expand on the consistent comments that have been made here. I believe that this document should split Category A/B versus C/D vessels. I agree with a lot of Dave Goethel' s comments. I also support higher percentage of monitoring on A and B vessels.

For some historical perspective, when I spent nine years on the Council, we dealt with allowing these vessels into this area. They explained themselves, and the Council wasn't clear on what the fishery was at that time, but they sold it to the Council. They said they wouldn't have a problem with groundfish. Now a few years later, they have an allocation of groundfish. These are the things that have developed since the fishery has arrived, and they are well-established. The size of the vessels do not mix well with the historical fisheries that were here prior to when they arrived. They describe themselves as midwater boats, and the midwater nets are in the water column. The fishery can take place in the whole water column, right down very close to the bottom.

They haven't blended well with the other traditional fisheries in the area. When these vessels show up, there is always a problem, whether it's gear conflict, or a variety of other things. I can remember when the fishery arrived, they said they would take observers. It never transpired, and now we are finally getting to that issue to see what's really going on in the fishery. The comments have been relatively consistent here tonight.

Don Swanson, recreational fisherman: I have been a recreational fisherman for almost 50 years. Most of my fishing knowledge is south of Boston. We are concerned down there about the river herring. There has been a moratorium on river herring in Massachusetts for over six years now. There are lots of hotspots recorded in the document. We know where the river herring are during certain times of the year. I would like to see these areas closed down or if they fish for herring, to have 100% coverage on the boats in those areas. It's very tough, especially for the guys I fish with – the problem is that it is illegal for anyone to possess river

herring in Massachusetts, yet they are caught and sold as lobster bait constantly. You should really do something to address river herring in Amendment 5.

Dave Linney, Cape Neddick ME, tuna fisherman: There isn't a fisherman that doesn't understand that herring is the most important thing in the food chain. Everyone understands ecosystems and what the herring do to that system. We are here to try to prevent the useless killing of herring. We understand lobstermen need bait. Some of these herring have to be taken, but there is no sense in wasting them. We need to accurately observe what comes aboard or doesn't come aboard.

We need to accurately get weights. I agree with Dave Goethel that weighing each fish will spoil a lot of herring, but there should be a tote weight, and there should be better methods than having a captain call a weight when he has a vested interest in it. That's like the fox guarding the henhouse.

As far as observer coverage goes, yes only the big boats. If 97% of the herring come from about 20 boats in the A and B category, that's where you put your money. If you can control 97% of it, you've got it licked.

I have seen the herring come and go, mostly go recently. We did live with purse seiners. They seemed to have a clean fishery. You do need 100% coverage – it may take two or three people but it's 100% coverage. You need to monitor every tow on the big boats and control 97% of what comes aboard to make sure there is no waste. I have heard from the boats, the owners and captains, that they fish clean so they have no problem having 100% observation on board because they have nothing to lose. It would make life a lot easier for them because we won't have these hearings if we are all satisfied that things are clean out there and that the quota is set properly. If that gets all that off their back, they should be willing to pay for a share of it, and I think they should. I don't pretend they are getting rich, but certainly the small boats aren't. They could help out with paying for it.

Jenn Kennedy, Blue Ocean Society for Marine Conservation: We are based in Portsmouth. I would like to provide a second voice for whale watch industry. We have seen the difference from when the big midwater boats come into the whale watching in the Gulf of Maine. All the whales disappear. When they weren't allowed to come in during the summer, the whale watching just expanded. Not only is it great for the whales, it is great for tourism and gets more people to come to the area, which is great for everybody.

We also echo CHOIR comments on 100% observer coverage and reducing dumping, and everything they recommend.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-46

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Thursday, March 15, 2012 LOCATION: Sheraton Harborside, Portsmouth, NH

CERTIFIED BY: Lori Steele

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Grout ✓		
Paul Howard Abs		
Chris Kellogg Abs		
Lori Steele ✓		
Talia Bigelow ✓		
Peter Shelley		CCANH
Dan'l Salerno		603-926-8575
Hal Weeks		603-430-5220
Keper Connell		603 498-7577
JOE JAKUBIEC		603-772-9505
Tom Sutton		603-617-0049
Steven Cadrin		781-244-5202
Dave Libby		207 361-1300
Michael Walsh		603-559-4849
Chris Weiner		
Robert Baker		603 [illegible]
JAMIE COLBURNE		HERRING PDT/UNH
Peter Pappalardo		603 964-5545
Erika Feller		603-817-1648
Erik Anderson		
Neil O'Brien		603 918 6705

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-46

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Thursday, March 15, 2012 LOCATION: Sheraton Harborside, Portsmouth, NH

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
Tim Virgin		207 251 0554
Michael Blanchard	1 Long Hill Ln Newbury	978-462-9026
Steve Weiner	11 Sudbury Rd Amherst MA	978-256-7637
Patrick Paquette	Hyannis MA	781-771-8324
Douglas Mercado		603 365 3803
Tony Petrarca		603-944-1226
[illegible]	198 Pond Rd Barrington NH	603-312-1139
"	112 Morse Hall, UNH	603-862-4482
Jon Pendleton	4 Park St Box 403 Concord, NH 03301	603-224-7855
Mark Poirier	3 Apple Way Stratham NH 03885	603.670.3466
Ritchie White	30 Lang Rd. Rye NH	
Devin Chouinard	P.O. Box 2187 Seabrook NH 03874	603-512-3009
Jeff Farrell	31 Gorrity Rd Lee NH 03861	
Jeremy Loomis	61 Spur Rd Dover NH 03820	603 781 8855
Jim Dufresne	9 Mohawk Lane Brentwood NH 03833	603 5418 5743
Tyler McLaughlin	27 Main St. Hollis, NH 03049	6038609003
Kelly McIntire	Po Box 229 Ogunquit me	03907
Matt Nash	17 Bourque St Somersworth NH	03878 207-368-8862
Garth Moran	315 Old Garrison Rd Dover N.H.	03820 603-743-8315
Chris Adamaitis	4 Demeritt Ave Lee NH	03861 603 965-8159
Bill Neelon	43 CRANK RD HAMPTON FALLS, NH	03844
Mike Lorusso	P.O. Box 774 OGUNQUIT ME.	03907 2076469025

DAN DOUMANI	15 ERIE AVE	NBPT MA	01950	978-361-5945
TIM HEALEY	988 WATER ST	NBPT MA	01950	978-423-3076
Steve Hella	Barrington, NH		03825	603-785-8862
Jim Hella	Barrington NH		03825	603-498-8862

State Board of Directors

Donald L. Swanson
President

Michael Watosky
Vice President

Michael Reeve
Treasurer

Gordon Thompson
Secretary

J. Jeffrey Barnum
Dr. Larry Albright
Capt. Dave Beattie
B. David Bryan
Chris Fenerty
Silas Gordon
John F Habig
G. Ritchie White
Phil Desfosses
Capt. Dave Gittins
Dr. Mitch Kalter
Bryant Bickford
Pia Bickford
Donald Lovett, Jr.
Robert Ferri
Capt. Peter Whelan
Christian Stallkamp
Bob Bode
Matt McCarthy
Ellen Goethel

Coastal Conservation Association
Of New Hampshire
Post Office Box 4372 • Portsmouth, NH 03802
Phone: (603) 731-2669 • E-mail - ccanh@worldpath.net
Web Address - ccanh.org

March 15, 2012

Comments on Draft Amendment 5
Paul J. Howard, Executive Dir.
NEFMC
50 Water St. Mill 2
Newburyport, MA. 01950

Dear Sir

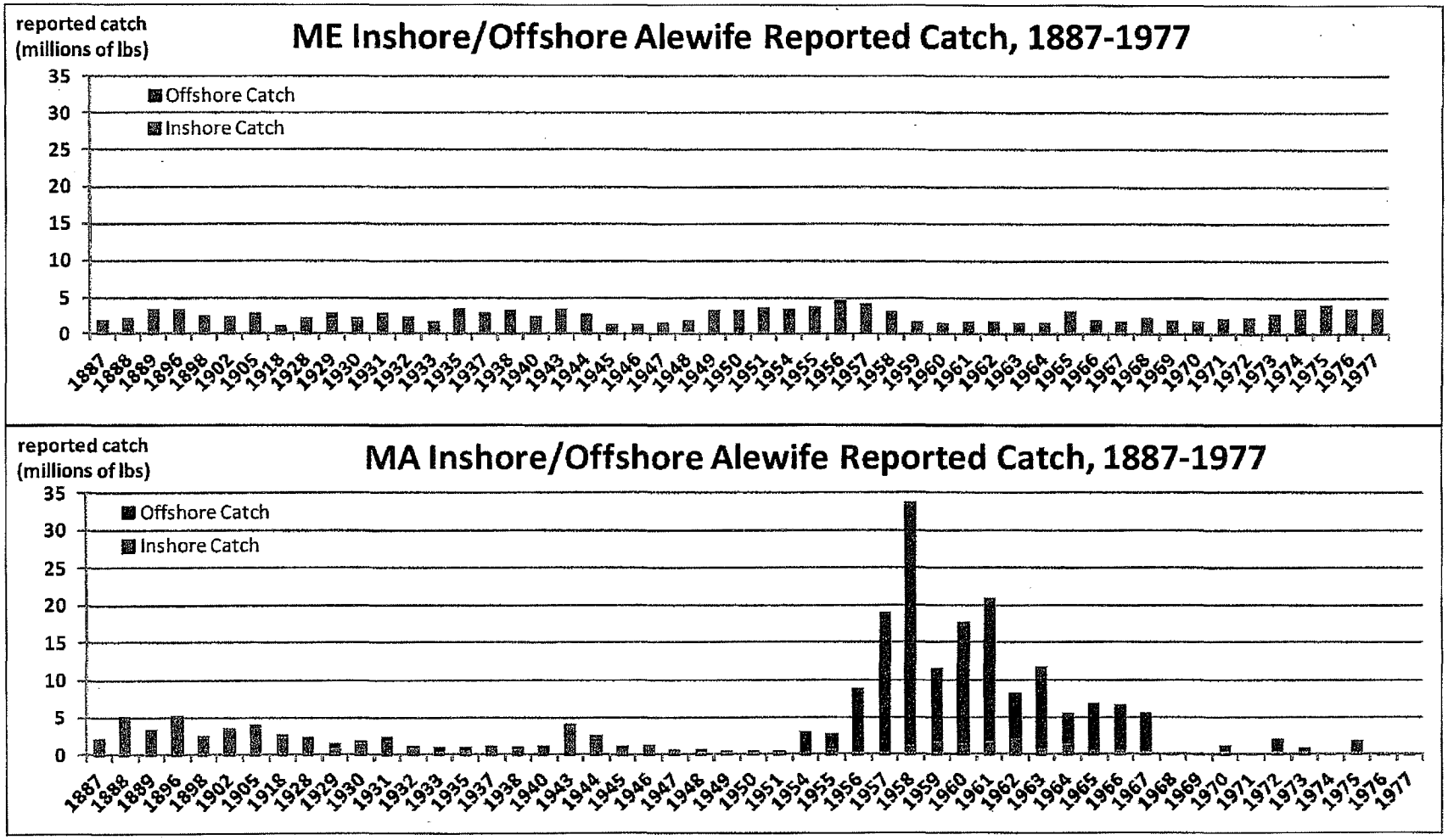
The Coastal Conservation Association of New Hampshire (CCANH) is very concerned regarding upcoming measures being considered regarding the herring fishery. Measures bringing greater accountability are desperately needed. CCANH supports the following alternatives to Amendment 5 as applied to category A and B vessels. We do not feel that the measures sighted below need be applied to the smaller category C and D vessels.

We feel that honest reporting of by catch would be supported by Section 3.2.1.2, alternative 2, calling for 100% at-sea monitoring on all midwater trawl fishing trips. We also support Section 3.2.3.4 alternative 4D, allowing only five fleet wide slippage events per herring management area. Section 3.4.4 alternative 5, eliminating mid water trawling from areas established to promote rebuilding of ground fish stocks, should also be approved. We also would support Section 3.3.5 if it were modified to require immediate implementation of a river herring catch limit on the total amount of river herring caught in the Atlantic herring fishery. Finally, CCANH supports Section 3.1.5 option 2, which would require accurate weighing and reporting of all catch.

We understand that some of these measures could be difficult to institute and enforce, however, due to the critical role that herring play in the ecosystem and economy, instituting these measures is critical if a sustainable herring fishery is to be maintained. Thank you for your consideration of our comments.

Sincerely,

Donald L. Swanson
President, CCANH



Alewife reported catch by home port of Maine (top) or Massachusetts (bottom) from 1887-1977. Catch was aggregated by offshore fishing gears (otter trawls, mid-water trawls, gill nets and purse seines) and inshore fishing gears (pound nets, weirs, trap nets, bag and dip nets, cunner traps, haul or inshore purse seines, and anchor or stake gill nets). Data sources: US Fish Commission Reports, Reports of the Commissioners of Fisheries (under the Department of Commerce), and The Fishery Statistics of the United States (under the Bureau of Commercial Fisheries) USGPO, Washington, D.C. All years listed had explicit data; missing years yielded no data.

Historical data suggests that offshore fishing significantly impacted alewife populations.

- During the period 1887-1977, there were no uniform restrictions on offshore or inshore alewife catch. All alewife that were caught could be sold.
- Red columns are reported catch weight of alewives landed by vessels fishing offshore, primarily seiners targeting mackerel and herring, with some otter trawl catch.
- Blue columns are reported catch weight of alewives landed inshore, primarily by static estuarine and riparian gears targeting alewives.
- The increase in offshore catch precipitated a sharp decline in inshore catch in Massachusetts.
- The relatively low offshore catch in Maine had little impact on Maine's inshore catch, and the difference in the demonstrated impact suggests separate spawning groups of Massachusetts and Maine alewives.

William B. Leavenworth, Ph.D.
Historical Ecologist, Gulf of Maine Cod Project
University of New Hampshire
Institute for the Study of Earth, Oceans, and Space
Ocean Process Analysis Laboratory
112 Morse Hall, 8 College Road
Durham, New Hampshire 03824-2600
Work: 603-862-4482
Email: William.Leavenworth@gmail.com

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Seaport Inn
Fairhaven, Massachusetts
March 19, 2012, 7 p.m.

Hearing Officer: David Pierce
Council Staff: Lori Steele
Attendance: See attached (approximately 100 people)

Dr. Pierce introduced Council staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Jocelyn Kerry, proxy for Sarah Peake, ASMFC legislative commissioner for MA: I am here to testify on her behalf in support of more comprehensive accountability measures in Amendment 5. Her support of these measures is grounded in the belief that the current system is not working and that the herring fishery must have an effective monitoring system in order to ensure its future viability. To accomplish this, it is important that:

1. Vessels report complete and accurate catch weights for all trips.
2. Category A and B midwater trawl vessels shall submit to 100% observer coverage.
3. Everything in the net must come on to the deck and be observed and reported.

Thank you for consideration of her comments. Adopting these regulations in Amendment 5 would go a long way to ensuring the stability of one of the most important resources of the New England fishing industry.

Raymond Kane, Chatham MA: Nine years ago this coming October, was our first formal meeting in Saugus. I am Vice Chair of CHOIR. I will submit written comments.

In 1999, the New England Fishery Management Council unknowingly approved the most gear efficient fisheries to fish in the Northwest Atlantic. At that time, the industry welcomed 100% observer coverage and convinced the Council they didn't catch groundfish. Throughout the history of the fishery, they do in fact catch groundfish and have never welcomed 100% unless stipulated by the judicial system.

We want 100% observer coverage on Category A and B vessels in the herring fishery. It has been stated that there are 43 permitted vessels, but a more realistic number of active vessels is 12-15 vessels that account for 97% of the landings. They are a very efficient gear type, and one

tow could be a catastrophic event. Both management and scientists need to know of these events.

Second, we want no more than 10 dumping events in a management area, and these events include safety, mechanical, and dogfish. These vessels must learn to fish within a management plan and be accountable for every species they catch.

In every fishery across the United States, the fish are weighed. The herring fishery should be mandated to weigh their catch. As of today, it is an estimate between captain and fish dealer. We are often reminded of what a high volume fishery this is, so catch must be weighed. We are talking about millions of pounds of fish. The west coast whiting fishery and Alaskan pollock fishery both weigh their catch and have 100% observer coverage.

We know for a fact that river herring are caught in the see herring fishery, and therefore we want a river herring cap.

These vessels should not fish in the groundfish closed areas, especially with the latest groundfish assessments on Georges Bank and the Gulf of Maine. One bad tow could be catastrophic to the groundfish stocks.

I ask that the New England Fishery Management Council establish a herring management plan that is amenable to thousands of stakeholders and the entire marine ecosystem.

Robert Decosta, selectman Nantucket MA: I am representing the town of Nantucket. We ask that you adopt Amendment 5 with emphasis on:

100% observer coverage for A and B vessels

100% no dumping policy. We feel that the entire catch needs to be counted and that whatever is in the back of the net be observed.

All landings be accurately weighed and reported, not estimated

Prohibit midwater trawling in groundfish closed areas. With the drastic numbers in the groundfish reports lately, we should give juveniles need as much time as possible to mature and spawn.

Improve river herring protection. Our river herring in Nantucket have all but disappeared. We have no commercial fishery. The waters are pristine and clean, so the herring are dying before they get there to spawn.

Fishing is very important to the economy in Nantucket, not only commercially but recreationally. Our fall striped bass fishery, which was once considered one of the best in the world, has all but disappeared because the migration of herring that comes down the east side of the island doesn't come through anymore. These herring are sucked up by midwater trawlers during the summer months, and when it's time for the fish to come through, they are gone. We urge you to support Amendment 5 with emphasis on those points.

Alex Freedman, Martha's Vineyard MA: Thank you for the long effort into the plan. I represent the Dukes County Fishermen's Association. On behalf of them and for myself, I want to strongly urge the Council to adopt Amendment 5. Speaking to objective 4 about the ecosystem and herring as a forage – that's why I am here. That's why my fate and my community's fate depend on the Council's actions.

Not so long ago, a very efficient, lethal system of fishing was introduced to the east coast, not to a random species or an apex predator, but to the key forage species for many of the fish our communities depend on – striped bass, tuna, codfish, all sorts of groundfish, even marine mammals.

I have all the respect in the world for trying to manage species individually, but playing "whack a mole" is not the way we should look at our ecosystems. And in that ecosystem, the tree of life, herring the trunk. Herring are a very important species. And I speak of sea herring because everything in Amendment 5 will help river herring populations. I echo the comments from the Vineyard and Nantucket. We have pristine runs, and the river herring are not returning. They are disappearing somewhere.

I want to strongly urge for Category A and B boats, to have anything less than 100% coverage doesn't allow the Council or NMFS to make informed decisions. It may be an inconvenience for the industry. Yet so many other industries, species, and fisheries depend on accurate catch information. That includes weighing of the catch and as little dumping as possible. From the meta-view, this is too lethal and too effective a method of fishing.

I would like to close by echoing the words of my mentor, the late Tom Osmers from the Vineyard – fishing needs more intentional inefficiencies. Pair trawling and midwater trawling is far too effective. Now is an opportunity that the Council has to make corrections that will benefit all of the ecosystem and all small-base fisheries.

I strongly urge you to adopt the amendment with as strong as possible – 200% observer coverage – as they do in other countries. It is impossible to ask the observer to observe every tow on a multi-day trip. There are technological possibilities. This is an opportunity to correct wrongs in the past and to preserve fishing communities into the future.

Darren Saletta, Chatham MA, MA Commercial Striped Bass Association: Our organization is over 125 commercial striped bass fishermen from the State of Massachusetts. Today, we strongly urge you to approve comprehensive monitoring and management reform with greater accountability and oversight to the industrial trawl fleet. At minimum, we request 100% at-sea monitoring on all midwater trawl fishing trips; an accountability system to discourage wasteful dumping of catch, including a fleet-wide allowance of 5 slippage events for each management area, after which each event would require a return to port; no herring midwater trawlers in established areas to promote rebuilding groundfish populations; an immediate cap on river herring; a requirement to accurately weigh and report all catch We understand the importance of this forage species not only to our striped bass fishery, but to all fisheries in New England. We encourage you to take these steps.

Andy Baler, fish dealer, Chatham MA: I represent the fishing industry. We are at a point right now where it is vitally important for the health of all our fisheries – groundfish, tuna, herring, striped bass, all the coastwide migratory species – that we make some serious decisions so that the health of those fisheries continue and the stocks can be rebuilt. We have tried for years and have been unsuccessful with groundfish fisheries. We have manipulated the rules and had highly restrictive regulations for the groundfish fishery, yet the herring fishery is highly unregulated. This may be the fix we are looking for since we have tried everything else. What I am asking for is:

1. 100% observer coverage – we know that in all our other fisheries, it doesn't work unless you have 100%. We know what we have to do the day we have an observer. Things are different. The only way to quantify/qualify anything properly is 100%. I believe that NMFS should fully fund that program for one year. We will have to work the bugs out after. Having 100% addresses a number of issues. You address the river herring issue. You will know more effectively where abundances of river herring are, if there are areas that need avoidance. It is very hard to make decisions right now. Without 100% coverage, you are missing most of the information to make a good judgment call.
2. Closed Area fishing – These areas are closed for mobile gear finfishing except the herring fleet. The only vessels that are fishing in there are the hook fleet, which spent years of 100% coverage to determine bycatch and mortality. There is no mobile finfish gear in there, and that should apply to the herring fleet.

From one industry to the other, We all want to stay in business and it's important that we can fish in the future. That includes the herring fleet. They have to think for the future too. Our future is tied to them.

When you have observer coverage, I think it's very important to sample the bag. I think it is necessary to have a minimum number of events for dumping. There are certain circumstances where you need to dump the bag. But if you can't find out what's in the rest of the load, it doesn't help the observer coverage. It always comes down to funding, and I think that NMFS needs to find a way to fund this 100%.

It is not one industry against the other. We are all in this together. We have been missing this one piece of the puzzle. We haven't seen a groundfish fishery fully rebuilt it's down. There are reasons the fish are down. I don't see the herring in the fish I unload anymore. We have had an unusual span of sand eels. We have never seen anything like sand lance this long. When the sand eels come to an end, what else do the fish have to eat inshore if there are no herring around? Things have to change, and I think that this is the most important thing. You will find out in June when you make your assessment.

Paula Lofgren, Chatham MA: I am a resident in Chatham. I urge you to vote in favor of Amendment 5, not as a commercial or recreational fisherman watching the public resources depleted by the industrial midwater trawl fleet, or ecologist or environmentalist concerned about the collateral damage to our coastal communities by depleted herring populations, and not as a lover of seafood who will no longer be able to buy local fish. I am a citizen and taxpayer of Massachusetts who has put my faith in you to defend our public resources which we have entrusted to you. As a new resident of a coastal town, I am furious to discover what has happened to the fisheries and the fishing industry along our coasts due to the presence of the midwater trawl fleet. Most importantly, I speak as a parent and educator. We teach our children to be good citizens, which means be fair and equitable, work for the good of everyone, follow the rules which are the same for everyone. Know that your actions have consequences. Do the right thing and if you are not part of the solution, you are part of the problem. In learning about the struggles facing our local fishing communities and the future of our marine resources, I am enraged that these principles do not apply in the world regarding the actions of and the management of the midwater trawl fleet.

As stated on the website, the MA DMF strategic plan has as its number one goal (quoted) to improve fisheries sustainability, promote responsible harvest, and optimize production of living marine resources. The first sub strategy is to collect precise, accurate data to enhance fisheries management. Provisions in Amendment 5 will provide this data and help you reach this goal.

The Strategic Plan also states as its vision sustainable fisheries and a healthy marine ecosystem achieved through innovation, collaboration, and leadership. I urge you to show leadership and put in place these important provisions:

100% observer coverage of met vessels, no midwater trawling in closed areas, no dumping of unsampled catch, accurate weighing of all herring landed, and protection of river herring bycatch by the herring fleet.

Set an example for the next generation of environmental policy makers by doing the right thing to protect the resources. As an aside, I have heard that one of the reasons for not having 100% or 200% at-sea coverage is the prohibitive cost. When I received my teaching certificate in 1974, it was supposed to be for life. As times changed and accountability increased in the teaching profession, now I have to pay for the education required by the State, I have to keep reams of data saying I have fulfilled the requirements, and I pay to recertify every five years. I find it appalling that that is required of me as an educator but not of the midwater fleet.

Mike Abdow, Chatham MA: The observer coverage is a joke. They get 50,000 pounds of haddock, the observer told them, but where did the information go? To 50% over on the catch, the observer is there, yet where does the info go? I don't see any penalties, I don't see anyone stop fishing.

They don't weigh the fish how can you have a TAC without knowing the weight? You cannot guess what they are going to catch. They are going to lie, everybody does. There is no one there to watch them. You stop all of us from taking herring out of a brook because we want to catch a striped bass with it, but those bastards take plenty of them out there. I know because I have gotten herring from them, and alewives were in the mix. I have watched them pump out, and I have seen dead herring, alewives, laying in the water, along with cod and haddock. I even got in a fight with the guy. He threatened to run my boat over. I went the next day with a gun because no one is going to tell me you are not fishing on my property, especially some guy who comes from Ireland. Why are they even allowed in this country? It's frustrating. They came here back in the 90s, and I could go for 10 miles in the spring and see loads of herring on the surface everywhere. The minute they showed up, we started losing herring. I know the guys who own the trap businesses. Now, if they catch three mackerel, they get excited that the mackerel have come in, when they used to catch 20,000 a day. These guys used to catch boat loads of mackerel, and they don't catch any anymore. 1,000 used to be 20,000 30,000 a day. As soon as those boats showed up, everything started to go downhill – tuna fishing, bass, groundfish. I went to Washington with some of the people in this room. We told Congress, if you want the fish in the ocean, you have got to feed them. The poor guys fishing the traps are done. Those guys catch the fish offshore. Our fishery for squid is done. Those boats have done the damage, they made the money, and it's time to kick them out of here. This is America, and this is our place.

As for estimates of what is coming out in June, we have had a couple of real boo-boo estimates on the groundfish, so I can't trust the assessment anymore. Oops, we were over by 90%. The fishermen pay for that. As for the assessment in June, I hold no faith in that anymore. This is

wrong. I have been doing this for a very long time. I have seen the downhill trend. I have seen fish not replenish themselves.

Observer coverage 10,000 percent. Whatever they do, by the time it gets reported, the damage is already done.

Bruce Peters, charter boat fisherman, Chatham MA: I am also a commercial fisherman. Why do we have boy scout troops taking the weekends off and cleaning up the herring runs if we have the midwater trawl vessels scooping up the fish taking them all?

100% observer coverage

No fishing in groundfish closed areas

More protection of river herring

Accurate weighing of all herring landings

No dumping of un-sampled tows

Eoin Rochford, NORPEL: We process herring and mackerel. What amazes me is the anecdotal information I have heard here. I have been involved in herring fishing for over 30 years. It is actually a clean fishery with very little bycatch, as the observer data shows if they take the time to go online and look at the observer data.

100% observer coverage would be welcome as long as the industry doesn't have to pay for it. The problem I see is that the industry will have to pay for it. When Amendment 1 came in 2006, we lost about 30% of the boats in the directed fishery that landed over 100 tons, the boats that kept the plants going. If the burden of observer coverage is put on the boats, we will lose at least another 50% of the boats that are there. That means the boats left will have more resource to themselves. With the herring resource or for any fishery, it is important to spread it out and have more people have access, not less. I would welcome 100% coverage if people would look at the data and see how clean the fishery is and how little groundfish and river herring are being landed by the herring boats.

When it comes to weighing the catch, the burden of who pays for this is the problem. Herring is not a high cost fish, it is primarily used as lobster bait. So the burden of cost will go back on the lobster fishermen to pay for the scales because the bait will be more expensive. When Amendment 1 was introduced, they said there would be no effect on the lobster guys. Unfortunately, they are paying about twice the amount for bait now since 2006 as a direct result of these amendments because the cost will always be absorbed by the end user. We have to look at the cost and what effect it will have on the end user, who is most impacted. That will be the lobster fishermen, whether Massachusetts, Maine, Rhode Island, or New Hampshire, all will pay a higher price for bait. If the government is not going to pay the bill, I would be very slow in recommending 100% observer coverage.

When it comes to slippage, nobody wants to go through the effort of catching all this fish and dumping then. We are not recreational fishermen, and we never were. It's anecdotal information. I have a big problem with the term slippage. I know where the term is coming from.

Willy Hatch, fisherman: I support observer coverage, maybe 200% so if someone is asleep, maybe the other observer can be present during the haul backs.
River herring there should be strict closed areas in the areas to protect them. There are definitely areas with big interactions. They should be closed, just like the runs are closed for us.
There should also be inshore closed areas for the midwater trawl fleet because of the interactions they have with the other boats – groundfish, tuna, charter, and striper boats.
There should be no dumping. They need to be accountable for what they catch. That's why we have observers.
I heard talk about how much herring to take out of the ecosystem. What needs to be taken into account for health of all the other stocks Gulf of Maine cod, next year when the Georges Bank assessment cod comes out, that could be even worse next year
I just heard about impact to the end user, the lobstermen. How about the end users like groundfishermen, tuna fishermen. Fish on the herring schools. These guys come in and wipe them out.
Net slippage, self-reporting, guesstimate between the buyer and captain. I wish I could be accountable like that.
Accurately weigh the fish and be held to the same standards as a guy like me with a rod and reel.

Patrick Paquette, XXX: testimony on my own citizen my own opinion
100% monitoring and am not necessarily strong opinion about who pays for it. We had to pay for all of our monitoring…through excise taxes or licenses, we pay completely. If the industry has to pay for monitoring, they should. If the government should help them, that would be good. Decision should be tied to what the fleet needs
Evidence fishing differently with monitors…catch swung over 1 million pounds in a week
Vito testified that things are different
Dumping regulations big loophole – Sean Gehan said his job was to find loopholes…cannot be allowed to only count dumping events when there was an observer on the boat. We got 80% offshore but dumping happens in all areas, all times of the year. To only count when there is a monitor on the boat is not acceptable. The public wants to slow the needless waste of natural resources
Groundfish industry has taken a hit
Same standard in this fishery
River herring – 2011 fishing season and SMAST program with industry – their website reported three large river herring bycatch events on the backside of cape cod in 2011 in the winter. This is why millions of dollars spent shoreside have us concerned. With millions of dollars in shoreside improvement, we still see things going down. ASMFC Matt Cieri – 2010 he believed that this fishery may catch more than directed harvest of river herring coastwide. RH hotspot closures are a beginning… the alts could be combined. Any hotspot closure is fine but there is concern if the fleet runs into RH elsewhere. Try to address where we know it's happening as a beginning. If they run into it elsewhere, let's cap what else they are allowed to catch. This fleet has turned haddock into lobster bait…our money fish is now lobster bait…criminal. It's capped so let's cap river herring because it's a species of concern. NMFS has listed it as a species of concern. We should close the areas where we know/predict bycatch
SMAST scallop YT program lives and dies on a catch cap… should cap this bycatch amount
Groundfish closed areas – herring comm. Moved to cons but rejected the ability to put bottom sensors on the net. Industry said they would break bottom sensors

Should not be allowed in closed areas period
GOM haddock are in the toilet. GB cod in the toilet. Why is it that every species that interacts with herring are in trouble
This gear has no business in groundfish closed areas
The impact analysis in the document almost completely ignores the recreational , charter fleet, and the groundfish fleet when haddock are being shifted into a new fishery...the whole resource is now being spread to more people and the long term impact of that is that there is going to be less fish for all of us
We will be submitting our trip log and our cancellations with names body of fish off Chatham in summer boats were done working about 10-12 days after there was nothing left. The bass were gone...middle of august...that was the result of small concentrated localized depletion. We had to fish off Nantucket difference of over $100 a day and some of the smaller boats couldn't go fish that far that's an economic impact
Fleet is suspect because it changes behavior every time it's monitored
Thousands of jobs at stake here

Dr. Peter Escherich, XXX: fish and wildlife biologist for 30 years.
Very clear that there is a major flaw in the NEPA analysis...economic review...fishery-related businesses and communities only refers to the herring fishery. I have heard testimony from tons of people affected tonight and this is not from the herring industry
Major failure of the EIS
Speaking for myself on this issue...should consider

Ted Ligenza, Chatham MA: 100% coverage

No dumping, bring it all home and use it and count it
Fault that not everything comes home
Accurate weighing of catch...someone other than a buyer
I take a lot of observers cannot expect a kid to get on a 200 foot boat to do a good job. Need four people on the boat and one person who is a senior advisor. I have talked to two observers on herring boats...one guy told me that he had no idea what was going on. Another guy said he didn't know what was in the net. Just because we have 100% observers doesn't mean it's not going to work. At least three or four people on a boat
8-9 guys on the boat bullying the observer
Fishing for cod in Nausett when the water gets cold, the herring and mackerel go down to the bottom, about six feet off the bottom. They were towing right beside me and I know they were catching codfish...
Can't do this. Cant fish this way and expect any cod left in the ocean. I am speaking for the cod.
Can't expect them to survive a pair seiner fishing on the bottom
The other thing I see in the document there is no cap on cod, pollock strict cap. With observers. They won't be able to tow on the bottom because they would go over the cap
Trying to avoid the codfish and pollock issue

Tom Smith, XXX: commercial fisherman agree with most of what has said. Cannot do 100% observer coverage with one guy...need two guys on each boat. I have been fishing next to these boats since the early 1990s on Jeffreys. Now we are fishing 130 miles offshore for tuna
Need to reign them in

Need accurate weights
Hard TACs. Every fish is weighed. There is no margin for error. I couldn't believe that the herring fishermen don't weigh the catch. And they keep going over on the quotas.
Done reading a book menhaden the most imp t fish in the sea. I believe that herring is the most important.

Buddy Vanderhoop, Martha's Vineyard, Dukes County Fishermen's Association: Decline of probably 85-90% in the herring run eight years ago. We are about 65-75% off now...not the small guys that are doing damage... herring boats should not be allowed to fish inshore during the spawning months, early March – June no inshore fishing at all because herring are coming in to spawn
In favor of Am 5 – 100% or 200% coverage and I would like to see them stop fishing in the closed areas
Very important to everybody
Everything depends on herring

Eric Braser, Georges Bank Cod Fixed Gear Sector Manager: If you don't know what's being caught, you can't manage the fishery. Council will implement the recommendations of nearly every one of the stakeholders here if it wants to manage the fishery. If not, then it wont

Stew Tolley, Georges Bank Fixed Gear Sector: Agree with what has been said. My big thing is that you cannot have 100% coverage with one person should be minimum of 2-3 observers on the boat
Self-reporting would trend towards lower weights, which would result in larger overages for the weights
Area 1B 50% overage with that, you don't even know what's being caught. Self-reporting needs to go. I know that if I had a 50% overage, I would get a large fine and lose my permit for a number of years, maybe even a jail term. What's going on needs to change

Eric Stewart, charter boat operator, Chatham MA: Biggest problem is 80 pages of a document to try to understand the problem. You need two pages the goals and objectives. The fishery is too good at what they do. They are effective, they catch everything. Small mesh they see the same thing on their fish finders that I see. I see herring mixed with groundfish , dogs, stripers, tuna I can't' tell you anything but what my fish finder is telling me, which is you cannot put a net down there and have a clean fishery
Objectives – need observers
Experimental fishery because you need data have a fleet out there and you need their data 100%.
Cannot have one person on the boat 24 hours a day.
Have to hold the boats to their quotas hard TAC and hold them to it. Hold them accountable.
No slippage, no dumping – whatever is in the net should come on board, should be accountable.
Herring as forage redundant objective if you address 1, 2, and 3
100000% coverage
No slippage
Weigh all of the catch
No fishing in groundfish closed areas
Stop overfishing...hold them to a hard TAC

Ryan Mann, Marstons Mills MA: Volunteer herring count in Harwich with Harwich Conservation Trust
Over the last three years, we have engaged over 120 people to come out to the run and help us gather data
Over three years, disheartened millions of herring last year, the total amount of fish was 10,466 fish. From millions and millions of fish
Pollution, water quality the amount of sampling over the last 15 years show improvements trying to remediate water quality
Dams removal has been a major effort across the state lots of effort in the communities
But there is not 100% observer coverage at sea
I was an observer on the groundfish fleet it is important to have the observers there, we don't know what is going on. The little bit of money that we have put into the run there needs to be something to show that all of the effort from our town this is a need and we need to know what is going on, full picture of river herring population
Without 100% coverage, have a variable and won't be able to solve the problem

Pete Kaiser, F/V Althea K, Nantucket MA: you have your job cut out for you
Fishing Nantucket in early 70s, herring were everywhere.
Since the two inch fishery started in the 90s, hard-pressed to find a herring anywhere within 20 miles of the islands. Doesn't exist anymore south.
River herring hotspots all the areas between the hotspots are full of river herring…they are basically a coastal fish. One of the objectives should be to stop RH bycatch should set up a ten mile barrier up and down the coast
Pair trawlers whales on the coast anyone with any common sense on the water would say it is a direct result of the nets. If there is a lot of interaction with whales, shut the area down
The burden is on the scientists can't possibly do their job with the existence of the two inch mesh fishery as close to three miles off the beach.
Area 1B overage reason for the quotas overage should be taken immediately off the adjacent area fish go across the line
A lot of us have been trying to make a living when this fishery came through the system…
We are frustrated that protocols were not taken…
100% observer coverage A and B boats, big boats
Along with no dumping provisions
Other large volume fisheries on west coast have 100% coverage…and no dumping, have to bring everything on board
Data from the observer coverage right now I would rather have no observer coverage, it's totally anecdotal if they can't bring the net up large bycatch is clogging the grate and the twos are getting dumped. Dirty little secrets of the fishery
No fishing in the groundfish closed areas. Cod are at an all-time low. Cannot fathom that these boats can The fish comingle.
Weigh the fish
If they can't fish correctly, then tough. Don't trash these other fisheries
Find the herring and you will find the other fish… you can't just catch herring

JJ Johnson, engineer, F/V Western Venture: Midwater trawl vessels you don't need two observers because there isn't a lot of time spent on deck. Industry supports 100% coverage at $325 a day, that's the west coast rate, and that's a fair rate. Industry consensus on that. We will pay that. If you can't do that here, get the west coast observers here
In the event that there is a problem on the boat, we don't want to put them in harm's way. We side pump, not a stern pump operation. There have been situations where I didn't want the observers on deck
Safe sampling station needs to be implemented
People don't get it that's where a lot of confusion is. We spend a lot of time looking for fish and we are extremely selective. We may fish in the morning and sit there all night because the fish are mixed during the day and they come off the bottom at night. You can judge our effectiveness by our numbers lowest bycatch ratio fishery in the northeast
I was a bottom trawler and I know how dirty that fishery is
We have got to take care of the river herring and fix the overages…we are reporting daily and the areas remain open. When we say we are done, shut it off 12 hours. You don't need several days to shut down the area
We feed the world all fishermen do we sell our fish for nine cents a pound to the poorest people on the planet. In Nigeria, two out of five people are starving. I can find another job. But I think it's important to remember that people are buying this fish. In New Bedford people come to the docks to get fish to eat.
Be careful about the political stuff and don't forget about what is important

Leo Maher, Chatham MA: Don't punish us here for the rest of the world…fighting to keep my livelihood alive
100% observer coverage.one observer isn't enough…because of wide variation
No met vessels in groundfish closed areas…herring fishery demanded increase in haddock quota wouldn't ask that if it was a clean fishery
No dumping of unsampled catch
I didn't realize they self-reported till tonight. Fishermen are not the most honest people
Protection for river herring is also very important

Joel Boyce, Yarmouth MA: little zones for river herring should be the whole coast. Every river used to have herring in it. Should be a coastwide exclusion of these vessels. The inshore areas are for the small boats
Monitoring – really talking about 15-20 vessels…maybe 40 observers….not hundreds of boats.

John Pappalardo, Cape Cod Commercial Hook Fishermen's Association: support 100% coverage on A and B vessels. Would like to see council take an honest stab at quantifying slippage and try to eliminate or reduce slippage. Continue to be concerned about access to groundfish closed areas, although Council is reviewing as we speak. If an area is to be closed for groundfish , should remain closed for all fisheries
Not sure about how the recent Am 4 lawsuit plays into Am m5 but something that should be taken seriously
Weighing of catch – how can we have a fishery that sets quota in pounds but no consistent way to weigh the catch. No standardized volumetric unit… should move forward with that one

I am like you tired of talking about this. I wish the offer to go to 100% coverage was accepted back in 2005 and 2006 when I started talking about it on the council.
I watched the resource decline from 2 million to 1 million to now 600 thousand. I am not very hopeful for the number that is going to come out of the new assessment, no bright signs on the horizon.
Universally not much hope for a robust herring resource that's why I got asking the questions I did back in those years. I got concerned about the herring resource, dumping of feedy fish or spawned fish in 1A, inability of timing for spawning closures Herring PDT member comment Steve Correia spoke after the last assessment and said he is very concerned about the repeating of what happened to the herring when the foreign fleets were here. He said that when the fleet turned its effort on to the NS spawning component, saw a quick decline and ultimate collapse of the resource. We don't have any spawning protection for that NS area.. flag that for the Council. If we get 100% coverage, can try to get observers to note the spawning condition of the fish when they are offshore
Frustration since I have asked for accountability…ping pong between the council and ASMFC. Can't help but wonder where we would be today if we had put the observers on and weighed the fish. Very real concern, to the herring industry as well
The industry should be shitting bricks
Need to also redefine the management boundaries. Area 3 should not come to the backside of Cape Cod and be considered part of the offshore fishery
Burden of proof has been on me and others to prove that there is a problem because everyone said the data is clean. Now we are hearing that the industry is willing to take 100% coverage at the rate the west coast pays. I hope that rate can be made available to them. Part of the accountability
Lack of data leads to poor decisions or decisions that are too slow, and the people who get hurt are the people who depend on the resource. Burden of proof needs to shift to all industries if the government can't stand up and pay for what we need to continues our professions.
Long time coming for this decision

Dr. Arthur Costonis, Chatham MA: What I would like to recommend is to get the trawling banned totally. Here is your data right here… I have heard enough good info tonight and we ought to listen to them. Thank you for your transparency…allowing everyone to speak.
I have seen the herring decline in my time…why don't you stop these guys? Make them clean it up…it's not fishing , it's killing. I am against it. Do we need a Rachel Carson to write another Silent Spring again? Listen to these guys.
Winston Churchill story
Rather commit adultery than take any liquor in my body… come on back lassie, I didn't know I had a choice. Ban them.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-47

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Monday, March 19, 2012 LOCATION: Seaport Inn, Fairhaven, MA

CERTIFIED BY: Lori Steele

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Pierce ✓		
Paul Howard Abs		
Chris Kellogg Abs		
Lori Steele ✓		
~~Talia Bigelow~~ Abs		
ALEX FRIEDMAN	97 OYSTER POND RD EDGARTOWN MA 02539	917.693.6962
Willy Hatch	145 Old Main Rd North Falmouth MA 02556	360-4613
Tim Silvia	11 Howes Rd Brewster MA	760-896-7845
Capt. Buddy Vandenberg	120 Old South Rd Aquinnah MA	508 645 3201
Capt. Greg Aller	51 GRISTMILL PATH M.M. MA	508 420-0399
[illegible]	33 Robinson Rd Fal. Vet.	508 524 3356
Andy Baker	P.O. Box 760 South Dennis, Ma 02660	508 385 9094
BILL CHARLES	29 STONEBRIDGE LANE MARSTONS MILLS MA	508 367-9658
BUCKY MAHER	77 EDGEWATER DR. WAREHAM MA	508-291-0293
DAVID MAHER	2 JOYCE DR PLYMOUTH MA.	
KYLE STEEK	3 ROBIN WOOD RD WAREHAM MA	508 295 8166
Darren Saletta	64 Mills RD Chatham MA	508 274 8805
Barbara Brennessel	51 Chris Dr. Wellfleet MA	508 479 6553
Paula Winter Lofgren	69 Horizon Dr. Chatham MA	508-348-1658
Michael DAROZA	14 Rivet St. Fairhaven MA 02719	508-999-7338

Laura Ludwig	Provincetown MA	207-263-5300
Tim Dempsey	Harwich, MA	406-600-5223
James Young	Fall River ma	508-6741547
Dan Cuddy	DanCuddy@ST.com	
~~Peter Clarke~~	~~Fall River MA~~	
Lisa Vanderhoop	Aquinnah, MA	508 645-3201
Roger Whitten	Marstons Mills MA	508-428-8203
~~Gary Blackett~~	~~Mashpee MA~~	508 477 1399
Bill Fallon	Falmouth MA	508 548 7674
Leo Maher	Chatham MA	508 945 4849
MIKE WOODS	CHATHAM MA	508-237-3393
Eoin Rochfort	Nobsel MA	
Steven Pechinsky	Fairhaven MA	508-9903184
Eric A Stewart	Eastham MA.	508-246-0778
Kevin O'Reilly	Plymouth	508.747-0811
Bruce Peterson	EASTHAM MA	508 255-0911
David Bellavance	Fairhaven, MA	508-96-6386
CRAIG PODZIKLAW	ORLEANS, MA.	509-240-2345
RAY KANE	Chatham, MA	508.367.1693
ALEX CARLSON	BREWSTER, MA	508-237-4364
DAN MIKE	Dennis MA	508 776 6623
Robert DeCosta	SELECTMAN - TOWN OF NANTUCKET Nantucket MA	508-228-5074
Mitchell Buck	Falmouth MA	508 274 5161
Ernie Eldredge	Chatham Ma.	508-958-0180
~~Stuart Colley~~	Chatham MA	508 945-4603
Peter KAIZER	NANTUCKET MA	508 325 2167
DANCE KAMINSKI	CHATHAM	508-945-5382
Randall W Saul	Chatham Ma	508-380-5835
TOM SMITH	Orleans, MA	508-255-0771

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-47

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Monday, March 19, 2012 LOCATION: Seaport Inn, Fairhaven, MA

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
STEVE SOARES	61 CRESTWATER RD HYANNIS MA	774 994 2242
JON BRINK	101 MAUSHOP AVE. BARNSTABLE, 02630	774-994-1499
Mike Abdow	Harwich Mass	5087337336
James Fleming	Harwich, MA	508 274 8823
Ted Cieszynski	Chatham MA	508 432 2628
Tom TRAINA	P.O. Box 1424 HARWICH MA	508 432 3294
ARTHUR COSTON/S	PO 458 N. CHATHAM	508-945-3611
GEORGE CITRUSTMAN JR	24 GUINEA Rd FALMOUTH MA	508-540-7411
RYAN MANN	40 Ash. Meigs Rd.	(914) 552-2399
JON R. JOHNSON	11-13 Harbor Loop Glo.	425-876-0230
John Pappalardo	Hyannis MA	781-771-9574
Rick Usher	89 North Water St NB, MA	774-240-0563
Luke Szymanski	89 No Warren St NB MA	774-265-0596
Russ + Martin	Box 65 S. Orleans MA 02662	508 237 5888
Ray Ransom	157 Seaisville Rd. S. Dennis Ma 02660	508 398 8361
ERIC BRAZER	FIXED GEAR SECTOR 1566 Main St. Chatham MA	
Peter Escherich	133 Terrace Ave, Riverside, RI 02915	
Claire Fitz-Gerald	61 Long Rd South Harwich MA 02645	847.721.8186
NANCY CIVETTA	WELLFLEET, MA 02667	508-349-2788
Joe Weinberg	106 Watershed Way, Marstons Mills 02648	774 994 0914
JOE HULICKEMEYER	137 Pleasant ST Hyannis MA 02601	
PAUL PARKER	23 Sam Ryder Rd Chatham MA 02633	

Doug Amorello	68 Stanrose St Pembroke, MA	774-766-8781
John Pappalardo	1500 Main St. Chatham	508-945-2422
ARTHUR CASTONIS	PO Box 458 W. CHATHAM, MA 02669	508-945-3611
Jocelyn Cuny	State House, Boston	617-722-2015
RICK MISZKIN	27 UNCLE ALBERT'S CHATHAM	508-945-2691
MIKE HARNEY	200 N. MAIN ST. S. YARMOUTH	508-737-0363

NANTUCKET ANGLERS' CLUB, INC.
1 NEW WHALE STREET
NANTUCKET, MASS. 02554

(508) 228-2299

March 15, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, Ma 01950

Re: Comments of Draft Herring Amendment 5

Dear Mr. Howard:

The Nantucket Anglers Club was established in 1969. Our 500 members are recreational fishermen that fish from both the beach and boat. Over the years we have watched the number of herring decline which has had a devastating effect on the inshore fishery. Codfish that were once plentiful close to shore have disappeared. Now the fall Striped Bass run once considered one of the best in the world is in jeopardy. The schools of herring that once migrated past the island in the fall are gone, swept up by the giant nets of the midwater trawlers. With the lost of herring the Stripers no longer hang around the island. The few fish that we do catch are small and skinny. There is nothing for them to eat. Our tuna fishermen have to run over 100 miles offshore to find any amount of herring and tuna. We urge you to adopt Amendment 5 with the following policies.

100% at-sea observer coverage of A&B vessels.

No Dumping Policy.

All landing be accurately weighted and reported.

Prohibit midwater trawling in closed groundfish areas.

Improve river herring Protections.

If the midwater trawl fleet is allowed to continue at its current effort or local fishery will all but disappear. Please act now.

Sincerely,

Robert R. DeCosta
Nantucket Anglers Club
Vice President

Town and County of Nantucket
Board of Selectmen • County Commissioners

Rick Atherton, Chairman
Robert R. DeCosta
Michael Kopko
Patricia Roggeveen
Whiting Willauer

16 Broad Street
Nantucket, Massachusetts 02554

Telephone (508) 228-7255
Facsimile (508) 228-7272
www.nantucket-ma.gov

C. Elizabeth Gibson
Town & County Manager

March 15, 2012

Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill # 2
Newburyport, MA 01950

Re: Comments of Draft Amendment 5

Dear Mr. Howard:

Nantucket has a long history of fishing and it is an important part of our local economy. Herring are the major forage for Striped Bass, Bluefish, Cod and Tuna in the waters around Nantucket. The fact that the mid-water trawl fleet has been allowed to fish the inshore waters off the Cape and Islands has had a devastating effect on our local fishery. Herring have all but disappeared around the Island. We urge you to adopt Amendment 5 with emphasis on the following points.

- 100% at-sea observer coverage of A&B vessels
- No Dumping policy
- All landing be accurately weighted and reported
- Prohibit mid-water trawling in closed groundfish areas
- Improve river herring protections

If the mid-water trawl fleet is allowed to continue at its current effort our local fishery will all but disappear. Please act now. Thank you.

Sincerely,

Rick Atherton
Chairman

16 Mar 2012

TO: Doug Grout, Chair NEFMC Herring Oversight Committee

From: Roger Whitten, Marstons Mills, MA.

Subject: Herring Amendment 5

I am writing today to urge the council to support section 3.2.1 alternative 2 for the implementation of 100% observer coverage on category A and B herring vessels. This is essential to provide the best science available, and to insure the best fishing practices are followed on every trip.

Second the council should support section 3.2.3.4 option 4c or 4d. in order to discourage the wasteful dumping of catch and account for every fish caught.

Third I urge the council to ban mid water trawling in areas established to promote rebuilding of ground fish populations. (section 3.4.4 alternative 5)

Finally I would support section3.3.5 requiring an immediate implementation of a river herring catch cap. It is telling to me that the taking an possession of river herring was banned 5 years ago for the citizens of this state and they are the "owners" of these fish, and yet no action to protect them as a by catch has been taken.

Roger A Whitten

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Holiday Inn by the Bay
Portland, Maine
March 21, 2012, 7 p.m.

Hearing Officer: Doug Grout
Council Staff: Lori Steele
Attendance: see attached (approximately 120 people)

Mr. Grout introduced Council staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Rich Ruais, American Bluefin Tuna Association (ABTA): Thanks for the amount of work these documents represent. I would like to try to provide a little background to some people who may not have been involved with the history as we have. ABTA represents giant bluefin tuna. Historically, we have gotten along well with the herring purse seine industry, which we have always considered to be vital in the Gulf of Maine to provide bait for lobster fishermen. Earlier than the 80s, the herring resource was overfished, particularly on Georges Bank before the Magnuson Act. In the 80s, the stocks actually came back even though the stock was labeled extirpated on Georges Bank. I am told that it was recolonized by Gulf of Maine fish at some point in time. There was exuberance on the part of mangers that there was a rebuilt resource. I was still working for Council staff at the time, and I recall it very distinctly. A lot of noise was made, and the Northeast Fisheries Science Center was a big part of it. The resource was said to be so big that you could take a million metric tons for several years without impacting the spawning stock biomass, and we were looking for an MSY of about 400,000 tons. I think that was combined for all three major areas.

The resource recovery obviously had the intended impact of urging the herring industry and possibly people outside of the fishery to put capital into the fishery expecting that, for the long term, that we have a herring resource to support an industrialized herring fishery for multiple purposes, including continuation of the lobster bait fishery, but also export markets and whatever other markets come along. In hindsight, most of the managers that I have talked to recognize the mistake. The first mistake that was made was clearly the scientific one. We have seen these large numbers go away. I remember talking about 175,000 yield, I remember when it was going to be 400,000 metric tons for MSY. I don't even know what the numbers are today, but I know they are a shadow of what they once were.

We encouraged all the effort to come into the fishery, the boats from the Pacific, the Irish fishermen looking to apply their expertise from their fishery to our fishing area to get on with

industrialization – in hindsight that was a mistake. In the 90s, as the conversion started to take place from a traditional purse seine fishery to a midwater trawl fishery, our tuna fishery began to suffer. We noticed it in the general category particularly – that after June 1, when the herring midwater trawlers worked the popular areas for our troll and harpoon fishery, we saw declining catch rates. We came to the Council in 1994/1995 and said we are having a conflict. We said we think these vessels are so efficient that they are causing localized resource depletion.

The first effort we made – there was no CHOIR – it was a handful of tuna fishermen that met with Mary Beth, and Frank O'Hara, and Peter Moore and tried to work out a voluntary compromise so we didn't have to get into this rule making. That didn't work. And ever since that time we have been at this battle, trying to fix this so that both fisheries can be accommodated. The fear that I have beyond this document, which has a tremendous amount of time invested in it, is that it might not be addressing the most critical issue – you can't now, but at some point you need to address the issue of overcapitalization that you have right now in the fishery. There is no way to share that small pie among the capacity you have to harvest this resource. That's the backdrop.

When ABTA looks at the current amendment, we have developed some specific points that we would like to see taken care of. We have always complained from day 1 that with industrialized, fleet size vessels new type of gear being introduced to New England, maybe the Gulf of Maine fisheries, but they were new in New England. We heard from the industry that they fish clean. Now we know for a fact that the midwater trawl boats not only touch the bottom, but also at times, can catch demersal finfish. If the demersal finfish decide to get 6 or 7 feet above the bottom, or even 20 or 40 feet above the bottom, they are going to get caught in midwater trawl gear.

We now need to put 100% observer coverage on these vessels to identify precisely what that impact is about, how extensive is it? Every groundfish fisherman in New England has a right to demand that the Council focus on that as a priority. Groundfish fishermen are sacrificing tremendously. Many are out of business. They are closed out of these areas completely, some of them permanently, and yet they are watching midwater trawl vessels steam through those areas, supposedly fishing for herring but we all know they can catch groundfish. We – ABTA – want to see A and B vessels required to carry 100% observer coverage to have the database that we need.

The second measure that ABTA supports CHOIR on is the implementation of Closed Area provisions with trip termination after 10 dumping events in order to reduce dumping on Category A and B vessels. You have heard the comments from Zack Klyver. The whale watch boats have noticed in Downeast Maine, substantial events where whiting was caught and dumped. We heard from herring purse seiners that when the fish is feedy, they typically have to let them go because the product Well, the midwater trawl don't have the option of letting them go, they are all dead. Again, that is something that has to be controlled. First, you need information on exactly how common this process is and what probability of trips this is taking place on, and then you have measures in here that we see could be very useful to reign that process in.

We want to see measures that prohibit midwater trawling in the groundfish closed areas. We think it's both a resource and equitability issue. Both are very legitimate concerns. There is plenty of ocean for them to be fishing outside of these particularly sensitive groundfish areas.

I know there will be a lot of comments. I do hope that people come up even just to say they support CHOIR and ABTA, so you will get the message of how important it is to us. It does come as a surprise for those of us who have been involved in fisheries for a long time, to see this one fishery not have a direct weighing of the catch. The majority of fisheries – I find it hard to see any other fisheries in our area that don't require weighing by totes, weighing by individuals, whatever it happens to be so that you know what you are taking out of the fishery. For a fishery that the industry likes to taut as a TAC-driven fishery, and that being the major conservation measure, and at the same time, maintain a provision where you are not actually weighing the catch, but you are simply hailing based on marks in the fish hold. That's not quite convincing information. As Patrick Paquette pointed out, you have vertical integration in the fishery. No one is accusing anyone of being anything but honest, but the temptation is there, and the suspicion can be there. The public has to have confidence that you have that control in order to justify restrictions on some of the fishermen in other fisheries.

(Clarified support for CHOIR's position that Category A and B vessels should have 100% observer coverage on all gear types.)

John Pappas, South Portland ME: I run a charter boat out of south Portland. I want to reiterate what Rich said. We have to get 100% observer coverage on these. There is really no way to know what's going on out there without it. We have all been out there, and you guys have heard about it after these boats come through. We have seen before and after, and we see what they say they are catching. It just doesn't add up. It's the only way to take care of the bycatch issues. The other one is the dumping. It's pretty much exactly what Rich was saying. The dumping has to end. It's dead fish going back in the water that is unaccounted for. These are mostly for the A and B vessels, they are big boats doing most of the catching, about 98%.

The groundfish closed areas – I spent my whole life out there. I have run a charter boat since I was old enough to have a captain's license. I grew up fishing on Jeffreys. I watched what happened in the 1990s when these boats would come through in the evening and go back to the same spot in the morning. I t's a whole different place, and the fish are just not there. We really do need to keep them outta there. It's unbelievable the change. I have had buddies or clients come up and fish with me, they were here before and here after, and they were just dumbfounded at the difference after these boats come through. The last thing is weigh the catch. Estimated catch doesn't seem to make a lot of sense. I don't know how accurate it can be.

Peter Speeches, Scarborough ME: I'm a 25-year commercial tuna fisherman and proud member of ABTA. I think we have to have 100% observer coverage on all permitted A and B vessels. It's 90-plus percent of the catch, and we don't have reliable data from them. We don't have reliable weighing data. We have estimated data on a TAC fishery. I think that has to end, it's ridiculous. And I think it's absurd to allow these vessels into a closed groundfish area. That can't be allowed. Let's get control of this fishery.

Shawn Tibbett, charter and commercial tuna fisherman: I own and operate a family-run fishing business, primarily charter fishing, and we do some commercial tuna fishing. As a Charterboat captain and tuna fisherman, I have spent a significant amount of time offshore, primarily in the Jeffreys Ledge closure area. I have seen what happens when the bait disappears overnight because these large vessels wipe them out. We are here one day, there's bait, the

midwater vessels are sitting 4 or 5 miles off, we come back out in the morning and there is nothing.

I have seen the boats haul gear. We have seen gear come up and stuff float off the back of the boat at 3, 4, 5 in the morning, there are birds everywhere. They are dumping nets, and it's got to stop. These vessels cannot be allowed to continue the way they are fishing. As a member of the ABTA, I agree with everything Rich said. At a minimum, the following actions must be approved:

- Implement 100% observer coverage on Category A and B herring vessels for reliable estimates of all catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life.
- Implement Closed Area I provisions with trip termination after 10 dumping events to reduce dumping on Category A and B vessels. The key to dumping accountability rules is to have real disincentives so that legitimate expectations are not abused and turn into loopholes. These measures will do just that since they don't rely just on self-reporting and the use of affidavits.
- Implement measures to prevent midwater trawl vessels in the herring fishery from access to the groundfish closed areas. These boats were allowed to fish in the closed areas under the assumption that they could and would not catch groundfish. This assumption has been proven false. Any lobsterman can tell you that in a 55 gallon drum of bait, there is codfish and haddock, it's not just herring. There is no reason these boats should be towing small mesh gear in areas off limits to groundfish boats.
- Implement measures to require the weighing of catches across the fishery. It is difficult to understand how an important fishery, in this day and age, cannot be weighing its catch. It is completely unacceptable to be basing totals on unverifiable estimates from captains and dealers.

I feel, as well as many of my fellow fishermen, that these recommendations must be met to ensure the future for all fisheries.

Tom Rudolph, Pew Environment Group: We have been working on this amendment since the beginning. It's been a long road, and it's nice to get to public hearings. We are looking forward to finishing it up. I would like to take a few minutes to talk about how we got where we are today. It was during the summer/fall 2007, even though Amendment 1 had been completed, people continued to raise concerns about the fishery. I remember when the Council initiated Amendment 4 at the time, in the fall of 2007, they got more comments on it than any other issue in the past. The Council responded to public concern about bycatch in the fishery, loopholes in the monitoring program, concerns about groundfish and river herring bycatch, and got the amendment initiated. It's been a long 4 and a half years, and these concerns remain as valid today as they were four and a half years ago. If anything, some of these concerns are heightened by what we have learned in the course of the analyses that have been a part of this amendment. I just want to go through a list of what has changed in the fishery?

Now, we are starting to get decent data on the extent of the dumping. When we first started this, there was a lot of denial that this dumping was a problem, and then the data began to come out. First, it showed a lot of tows. For the first couple years we had data, I think it was 8 or 10% or

11% of tows being dumped with fish that the observer couldn't access, depending on how you define dumping versus slippage versus released catch. But then the data came out for 2009 that showed over 1/3 of the tows in the fishery, the observers couldn't properly work up the entire catch because some of the fish are being dumped straight out of the net. So, the first thing that changed is we began to get data on the extent of the dumping, and we found that it is widespread. We found that it's unnecessary based on the reasons being cited. Safety and mechanical failure are not being cited as the reasons for the dumping all that often. The boat is full was the most common example. It's totally unnecessary and the dumping was frequent.

What else have we learned in the last four and a half years? We have learned through the pilot program in groundfish Closed Area I that we have a really good model, a proven tool that can start to reduce this practice and eventually probably put an end to it. It's been proven on the water to be safe and operationally feasible. We have proven that there are solutions – the Closed Area I rules as they exist now. You put a disincentive or accountability system over the use of these exceptions when dumping is allowed, and the fishermen figure out a way to get the fish on the boat, and let the observers work it up. We are not seeing these terrible problems of safety and boats having to leave the closed areas. It turns out that for most of this, they can get it on board. They can do it. We need to expand that to the entire fishery.

The haddock problem has continued and apparently gotten worse. Since we initiated Amendment 5, the herring fishery petitioned for and received a five-fold increase in their haddock bycatch allowance. We also learned that the problem of catching groundfish in closed areas goes beyond Closed Area I. We learned in 2010 that there was significant haddock bycatch inside Closed Area II. The data was sparse, but it showed that the catch rate of haddock was higher inside Closed Area II than outside. That is an areas where we didn't think we had a haddock bycatch problem when we started Amendment 5, and now we do. It really highlights the need to get these boats out of the closed areas.

We learned some revealing things about the extent of bottom contact in the fishery. When herring fishermen expressed concern about putting some innovative bottom contact sensors on their gear, they were afraid, they are expensive, and they would lose them on almost every tow. That was revealing in terms of the extent of bottom contact in the fishery. It drives home the need for better monitoring.

River herring – since we initiated this amendment, ASMFC didn't take action in federal waters. They took aggressive strong actions in state waters, but said they would not go there in federal waters. This really highlights the need for this council to do something. The states, in response to ASMFC, have really cranked down on river herring restrictions for the general public and anglers and people fishing in state waters, but federal waters remains totally unaddressed. Also, since Amendment 5, the agency made a finding that the ESA petition warrants investigation, and they are doing an ESA inquiry. And just last week, there was a ruling in a lawsuit in federal court. The judge found that the council should have considered whether river herring is a stock in this fishery, which we believe it is. It is caught, landed, and sold by this fishery in numbers. That lawsuit points to the need for the Council to take a careful look at what it can do about river herring in federal waters.

Finally, the most basic tool of fisheries management – holding the fishery accountable to total allowable catch limits in the management areas – is failing. Again and again, the herring fleet is blowing past the sub ACLs in the management areas, causing great harm to the inshore resource

and small boats and fishing communities that depend on a healthy inshore herring resource. Since Amendment 5, we have had an overage in Area 1A and a series cascading overages on the backside of the Cape in Area 1B, with no end in sight to these overages. They keep piling up.

I will quickly run through the list of options we support:

We support 100% observer coverage on the Category A and B herring fleet that catches the majority of the fish. We believe that this is necessary so that there is consistency with other US fisheries of this size, gear, and scale. In addition to supporting Alternative 2, we support Funding Option 2 – Federal and Industry funds. We support service provider Option 1, the status quo. I believe that was initially put in the document so that the states wouldn't have to go through burdensome requirements that corporations have to go through. But we want to make sure that states should have to go through NMFS certification so that we know the protocols are consistent and we get data sharing agreements that service providers have to meet. No problem if the states don't want to submit the financials and go through the audit process, but in terms of the observer protocols, they should have to do what the other providers have to do.

100% observer coverage is necessary to support enforcement of the herring quotas and catch limits and the dumping controls we support. In Section 3.2.3, we support slippage Option 4D – a hybrid with a fleet-wide allowance of dumping events, after which subsequent dumping would be subject to trip termination. I want to clarify that we believe that Option 4D was inserted into the document with the understanding that operational discards would be prohibited, and operational discards would be subject to the accountability framework. With the caveat that we get that clarified, we support Option 4D. Only a solution based as closely as possible the rules that are working in Closed Area I will work for us.

We support weighing of catch – Option 2 – and we support all three sub-options. Option 1 is necessary and is almost like a scaled down version of the catch monitoring and control plans that we originally promoted. Sub-option 2 is necessary for timely submission of landings reports with the dealers' weighing of the catch. The third option seems critical for linking to VTR for cross-examinations between vessel and dealer reporting.

We support a river herring catch cap. We always have and will continue to do so. We believe that Section 3.3.5 could and should be modified to implement a river herring catch cap as quickly as possible. We don't really understand Section 3.3.5. It's clear to us that the Council was granted the authority to do this under Amendment 1. The Council was given broad latitude to address bycatch problems, including catch caps, in Amendment 1 to the Herring FMP. Section 3.3.5 isn't really necessary. We support a catch cap now. The Council has ability to set a catch cap based on catch history until the ASMFC stock assessment is done. We also support hotspots as a methodology to hold the catch of river herring down. Alternative 3, Option 1 river herring closures. We support this for Category A and B vessels only. I remain concerned that Category D vessels would be lumped into any river herring closures at this time. It certainly is not appropriate for Category D vessels fishing with gear not capable of catching herring. Right now, if a Category D vessel has large mesh on board, it may be exempt. But what if it only has a hook, harpoon, or a lobster pot? Nobody wants them sucked into a river herring closure, and right now the document is a little confusing that they might be.

For groundfish closed areas, we support Alternative 5 – rescind midwater trawl access unless/until the fleet decides they want to do a rigorous experimental fishery under an exempted fishing permit. This is the process any groundfish fisherman who wants to access the closed

areas needs to go through. I can tell you from personal experience with closed area access experiments that we had to jump through tremendous loopholes. We had to test the gear in all times and areas. It took months, in some cases years, and cost hundreds of thousands of dollars to figure out whether we could take the groundfish gears into the groundfish closed areas. Small mesh pair trawls don't belong in there until there is solid data. We now know we have a problem in Closed Area II. I would urge you to implement Alternative 5.

Jesse Field, commercial tuna fisherman, Portland ME: I want to speak in support of what Rich said for ABTA. I think that observer coverage will resolve many of these issues we are thinking about here. Proper weighing only seems like common sense. And closed areas are closed for a reason.

Steve Weiner, CHOIR and ABTA: This has been a long process, and it's eventually going to land in the Council's lap. There have been 60 or 70 people at these meetings so far. People are busy, and the weather doesn't help. A lot of people who come to the meetings don't feel like getting up and speaking. This isn't where we want to spend out nights. But this is an important issue that has been going on for five years – 10 or 12 years for some of us.

I want to repeat that I believe we should have 100% coverage, and it's critical that it is only on the Category A and B vessels. One of the things that has bothered me a lot is that the industry has spent a lot of time throwing road blocks in front of constructive suggestions and real concerns. We never intended for this to be for C and D vessels. There are probably 20-plus boats that catch 98% of the fish, and those are the boats we are working on.

(Mr. Weiner asked questions regarding the possibility for excluding purse seiners from requirements for observer coverage)

I want to point out that there is an average 30% observer coverage on this fleet. So 70% are still not being observed. I spoke with Paul Rago, who is a scientist in Woods Hole and very involved in the SBRM, which I guess is a mechanism to determine how much observer coverage you need. I asked him if the boats fish differently on the other 70% of the trips when the observer isn't on the boat, how does that affect the SBRM coverage? He said that SBRM goes out the door because it really does assume – when you take the data and extrapolate it out - if that data isn't realistic, then you are extrapolating junk. That's what we believe in this room. Unless you get 100% observer coverage, and that may not even be enough. You are never going to be able to know what this fleet is really catching. CHOIR opposes the affidavit proposed in the document. It basically says the captain can look at the net that doesn't come aboard, guesstimate, and report that as reported catch for what he dumped. So the captain signs an affidavit and he tells you what he dumps. We oppose that. That is not independent monitoring. A lot of us in this room are captains, and we can probably tell you not to let the captain be his own monitor.

(Mr. Weiner asked an additional question about taking fish back out to discard after being landed.)

I hope you do the right thing. You have been listening to it for five years. It's from the heart, it's from experienced fishermen. We have been consistently at these meetings and consistently concerned. If the Council doesn't do the right thing here, they are part of the problem.

Tyler McGlaughlin, Rye NH, commercial fishermen: I agree with everything that has been said by – Rich Ruais, Pete Speeches, Steve Weiner, Robert Fitzpatrick. They have had knowledge of this fishery for 30 years or more. It's herring – it's an ecosystem. Without herring, there is no ecosystem. In the Gulf of Maine, if you don't have the ecosystem, you don't have any other fish, you don't have mammals, tuna, dolphins, anything. The method about midwater trawling bothers me. If you are purse seining, you can take the purse, see what you catch, and then you can release fish. When you catch in a midwater trawl, you tow, and everything gets mixed into the net. When fish lose their scales, they die. You can have slippage or shrinkage or whatever you want, but what is that going to do for those fish? They are probably going to die. Just this year in Rhode Island, we had "x" number of bluefin tuna caught by midwater trawlers. It's public knowledge, it's all over the internet. Rumors don't come from nowhere. It's people on these vessels spreading these rumors. It comes from a justifiable source. It had to have happened. For years and years, we have seen them tow off Chatham. We have seen them interact with large female striped bass. They dump the net and there are striped bass everywhere floating – dead. And there is no accountability. How is that fair? It's the same thing if they interact with tuna and whales. They can cut the stomach out of the whales so they can sink and doesn't wash up on the beaches and disturb the public. It's not fair. The boats are just too powerful and too big. It's not an ethical fishery. They are moving. It's like clearing hay. Whatever is in their path is gone.

I support 100% observer coverage. These guys go out to Georges, they go all over the place. One guy can't cover everything. It should be two men, 12 hour shifts. Make sure that ethical fisheries happen. In the fishery I participate in, ethics is everything. We have to obey laws. Our quotas are super strict. We get affected by dead discards from offshore longline vessels. It's ridiculous. We are an inshore rod and reel fishery. Why should we be subjected to regulations? When midwater trawlers can just tow in closed areas that small groundfish boats can't get into? It's not fair to the fish. I have seen it. The midwater trawl vessels have their sonars, so they come right inside three miles, take some bait, and then go right outside the line and there is no penalty. I have seen this. When I was 18 years old, I can remember sleeping on the anchor at night, and a midwater trawl vessel came through and towed the anchor for four miles. Being a young kid, I was pretty scared. These fishermen don't have any regard for anyone – fish, humans, mammals, anything. It's just not fair.

Why should any big vessel be allowed to fish in a closed area? When a small gillnet vessel with a precision net setting maybe three nets – how is that going to be more destructive than a huge midwater trawler coming through and plowing the ocean? It doesn't make any sense. To say that midwater trawling is a clean fishery, that the small C and D boats interact with less river herring than the big boats, is complete bogus. There is no way to determine – river herring don't migrate out and come back inshore – these small boats with a net that opens maybe 50 or 60 feet, that a midwater trawl isn't going to catch more? They tow the net between two boats. They should be excluded from all of this.

If they do pull a cord on the net, every fish should be counted against the quota. We get fish counted against us in the fishery as dead discards. They should have dead discards count against them as midwater trawlers. It's only fair. These are big powerful boats chasing after small fish. Why do we need such big boats taking small fish? I don't know what the numbers are, but most of the fish they catch is being shipped to other countries. It's not even used to the lobster bait fishery. And the prices just keep going up. It would be one thing if the midwater trawlers were

contributing like 80% of what they catch to the lobster bait fishery, but it's not that at all. How is that fair? They are taking our resource and shipping it to other countries, and now other fishermen in the United States who catch other species in the Gulf of Maine cannot target their catch.

Ben Martens, ME Coast Fishermen's Association: I work with the small boat inshore groundfish fleet in ME. I'm going to be brief because I know there are a lot of people who want to comment, but I think it's important to provide a different perspective here at this point. I want to focus on one issue here that our guys are concerned about, and that's access to the groundfish closed areas. We have heard a lot of bad news out of the Gulf of Maine about what's happening to our groundfish stocks. We are starting to hear some really bad news about haddock and other groundfish species as well, which have been shown to be caught in midwater trawl nets. If we are going to use these closed areas to try to rebuild the stock, we really need to treat them as closed areas at this point. What we are doing right now is not working. The groundfish industry is under a hard TAC. We are really trying to control all of different inputs there. We are trying to bring back Gulf of Maine ecosystem. We have set aside these areas as important to that process, so we really need to treat them as such. We have had a lot of guys who have brought this up, especially over the news that has been coming out about some of these resources. We will be submitting written comments.

Additionally, always going back to the Gulf of Maine ecosystem and what we are seeing out there, we are focusing on trying to rebuild the stocks, and making sure that we have enough forage base in the Gulf of Maine is crucial to that effort. To do that, we need to know what is actually happening out on the water with these boats. So 100% observer coverage on the A and B vessels is really important. They need to be held accountable. It's too big not to be held accountable. We need to expand the groundfish closed areas. The biggest part of the accountability isn't what is coming on the boat and going to the dock because we have great records. I do trust what is coming on board and going to the dock, but I do think that any time there is dumping, you need to take care of that. You need to account for what is dumped. We work with a lot of guys who need the herring, and we don't want these guys to go out of business. But we need to have accountability in place and make sure what is coming out of the water is correct and they are being treated on the same level as the groundfish guys.

Mike Faulkingham, ME Association of Charterboat Captains: Based on the evidence we have seen of impact of slippage on groundfish and other bycatch, herring stocks at depth and wherever they school, the true impact is that species are being negatively affected and we need to document that further.

To that end, the ME Association of Charterboat Captains supports 100% observer coverage on Category A and B boats, as well as observers watching for net slippage through completion of the trawl.

Dean Gower, commercial fisherman: We need 100% viewing on the boats. From a lobstering standpoint, they are hammering us on the gear. Every trap we lose, that's money coming out of my pockets. It's killing us.

If the captain fills out a report as to what he brings in, and his fish buyer fills out a report, there is no one really monitoring what is going on? Those two will always come together to make

money. Where is the government watching out for what is going on? They can audit this stuff till they are blue in the face. If you are the buyer and I am the fisherman, and we are making money, why are we going to stop? Our slips are always going to match. And they are going to match. Why don't we have people monitoring this from the government and tallying the weights? It's a central concern. Why don't we have this? This is such a big issue and there is such grey area. My father was a commercial scalloper for years and said fishermen are their own worst enemy. They are greedy. I'm more into the lobstering side of it, and I believe not fishing out what we want to do, but there are a lot of guys out there who don't care, and they will slip through whatever to make more money. Also, with a lot of the regulations involved, a lot of guys have to do that just to survive. If we are going to pass these laws, when is the government going to step up and actually oversee them? Make sure they are being done.

Joel Strunk, tuna fisherman, ABTA: I support everything that Rich outlined. I have been engaged in groundfish fishery. I am a tuna fisherman, but I have done a lot of work gillnetting over the years. I have friends that are still gillnetting, and there is a great polarity between success now when they go out and when I did it.

On the grounds I used to fish with gillnets, in the day we would do 10-12-14 thousand pounds of codfish. I can't jig on there now. There is a lot of work to be done in the groundfishery. To invade some of the few sanctuaries that are out there with huge boats that deal with great volumes of biomass is pretty unreasonable. I don't think we are taking those sanctuaries serious. Speaking of the huge volumes of biomass that those vessels engage in, it would only be reasonable to have 100% coverage on those vessels, considering the biomass they engage in.

Roger Fleming: We will filed detailed comments. Our comments will be consistent with virtually everything you have heard in terms of the alternatives we encourage you to adopt in your final decision-making. I want to note two or three points. As you know, we have worked with Midcoast Fishermen's Association for years on the groundfish closed area issue. We know now that the original rule that allowed midwater trawl vessels to access closed areas was based on a false premise. We strongly encourage you to adopt Alternative 5 – treat them the same as you would treat groundfish vessels. Make them go through the exempted fishing permit process before giving them access to the groundfish closed areas.

Second, I want to agree with the point that Tom Rudolph made earlier about the river herring catch cap alternative in the document. I was a little surprised that this became an alternative in the document. When you passed Amendment 1, it included a list of measures in the document to reduce bycatch. Bycatch caps is clearly one of those measures. I can see how it got overlooked because the regulations do not go through and list every specific measure in the Amendment 1 document, but it's clear that it is incorporated by reference. The alternative in Section 3.3.5 should be stricken, it's not really an alternative for adoption in this amendment. Alternatively, we would encourage you at the very least to remand or modify that alternative to adopt now a river herring catch cap. There is adequate data to establish a cap. It's done in other fisheries with comparable amounts of data.

Finally, in view of the decision of the Flaherty v. Bryson case, I would speak specifically on behalf of the plaintiffs, the most significant holding in that case is the error of not including river herring and shad as stocks in this fishery. I would submit that at this point in time, you could modify this catch cap alternative to include river herring and shad as stocks in the fishery. It

might require either going back out to public comment for a few days, or alternatively, a subsequent framework action to fill in some of the details in terms of the full suite of conservation measures that would be required. I would strongly encourage you now to adopt river herring and shad as stocks in the fishery, not just because the court found that legally it's required, but because it's really the right thing to do. There is no question that river herring and shad are in need of conservation and management, and that's a trigger for attention – that it should be included in the fishery. We encourage you to take that step now. The precise remedy coming out of the court is currently being worked out by the parties, so you may hear something on that before you make your final decision, but you can do it now and take the steps necessary to fix this problem.

Peter Mourmouras, Biddeford ME: Steve Weiner made excellent points. I would like to endorse implementing 100% coverage on Category A and B herring vessels. Also to prohibit midwater trawlers going in groundfish closed areas. Those are the two most important areas for our future.

98% people here are giving you first-hand knowledge and information, and I don't think that anyone is exaggerating as a fisherman in terms of what they are seeing. We are trying to protect the future. Every industry – computer, recreational, fishing – is trying to invest in their future. We probably won't see it in the next ten years, but we all would like to try to see this continue It's a heritage, it's an activity, and it's commercial. It's a right to have to be able to fish in your own waters. Other people taking your catch is absolutely appalling. I have spoken to lobstermen who have seen it. They think that it's an adequate amount of catch they are getting now, but they don't see any of this herring coming off these trawlers. It's going out of the country. We really need to protect our future. That's what everybody in the industry is trying to do. I hope you have some consideration.

Mike Lorusso, recreational and commercial fisherman: I agree with everything said in the room about 100% observer coverage. There should be at least two people on the boat observing it so that they get 24 hours coverage. Keep the A and B boats out of the closed areas. I have seen some of the fishing methods they do and how much fish they can wipe out in a day. It's pretty appalling. If we want to keep the fisheries alive and keep the herring fishery going, they A and B boats – we don't want to put them out of business, but they are going to put everyone out of business if it keeps going this way. I agree with what has been said here today, and I hope that you do the right thing to keep the fisheries alive.

Garon Mailman, tuna fisherman: I support 100% coverage on A and B vessels. The more herring around out here, the better off we will be. Keep them out of here. Trawlers and draggers bad, herring good.

Keith Jordan, commercial lobsterman: As a lobsterman, we need herring for bait. I am here to stick up for zone 1A where I lobster fish. I have had plenty of gear conflicts with midwater boats. I have never had a gear conflict with a seiner. The seiners could probably catch the quota in 1A. I believe they could have last year, if you give them enough time. For your document, 100% coverage might help with gear conflicts as long as they are looking out the front window when they are towing, and the back window when they haul back.

Patrick Paquette, recreational fishing advocate: I have spoken at other hearings, but we continue to find loopholes that I want to get on the record.

Option 3.2.2 measures for catch monitoring at-sea – Option 2 sub-option 2D – requirements for trips with multiple vessels. I know it's been a strong feeling of ours that if one body on a boat is considered 100% observer coverage, which I don't agree, but even more dramatic is the loophole that even if this option is to go forward, which I haven't heard a lot of controversy about, it leaves this statement at the end wherever and whenever possible. If the Council approves sub-option 2D, requiring a body on both vessels in a pair, or it says in the larger document when fish come aboard, that it's not an observed trip if fish is pumped aboard the second vessel and there is no observer on it. It's the only way to clean it up, and there is a giant loophole. We have heard testimony from maybe the PDT, or maybe the observers, that there are occasions where the fish are pumped away from the observer. The public assumes that would mean 100% observer coverage, if fish are coming on the vessel, that's a big loophole.

Also 3.2.2 Sub-Option 2F – visual access to the codend. This is in that suite of measures to help the observer. There appears to be another loophole in this. "On trawl vessels, the codend and any remaining contents…if this is not possible…the observer will document the process…"

I'm sort of tying this big giant hole with the language earlier that addressed operational discards. This seems to be saying that they are going to do all this work to make sure the observer is going to see the codend, but it describes it as the codend and its remaining contents. Later in the document, there is a section that would allow for what remains in the net not to be seen. Bycatch and operational discards, which I believe is the exact same thing. Operational discard is potentially bycatch, and without an observer seeing it, those terms seem to not meld together. I get the nuances, but this option as a standalone sounds good but it has a hole in it, saying we are going to do the best we can to let them see the codend, and then you have a loophole in the slippage measures. It sounds like there are two holes stuff can fall out of, but three different ways that good things can happen. I am very concerned about the Council meeting coming up, and Council members making some common sense assumptions about what something means, but then we get into the details, especially when we have heard industry lawyers at the microphone saying they look for loopholes.

Also, back to the affidavits – the affidavits are only required when there is an observer on board. The two slippage options that we are reading – one with five events and ten events before the accountability – but I have recently learned that only counts if there is an observer on the boat. So anything less than 100% coverage means that we are not counting the dumping events in those areas. That's beautiful if you are lucky enough to live or be affected by the conservation measure in an area with a lot of coverage, but if we have anything less than 100% coverage, there is going to be a big giant place where they can dump. The data has shown that dumping is happening in all management areas. The only data we have is that the Closed Area I rules work. The affidavit is really concerning. It sounds to me that we are only looking to minimize slippage when there is an observer on the boat. That's not why the constituents I work with are upset. We are upset because we believe that the boats fish differently when they are watched and not watched. Anything less than 100% for the measures to reduce slippage really won't work. It's very important that that is clearly understood before you vote. We will submit comments, but I will find it hard that you can read the number of comments that you will get. I want to point this out because there seems to be a giant number of loopholes that make good measures sound bad.

Brian Currier, Standish Maine: I agree with my fellow fishermen, I 100% agree that we need to implement the observer coverage on A and B vessels. We need to look out for our future, it's not just us as fishermen, but it is also going to carry into the next generation. At the rate we are going, it's looking like there won't be anything there.

Donald Simmons, tuna and lobster fisherman: I agree with Rich and Steve Weiner. As a kid, when I was five years old, I used to go to Cashes Ledge all the time with my dad. I would haul the fish and lobsters. We would see herring on the surface all day long. Herring is supposed to be on the bottom during the day. On Cashes Ledge, we would see them all day long. In the 90s, I went tuna fishing also. There would be so many herring on the surface for miles. Once the midwater trawlers got there, it took seven days to wipe the herring out on Cashes. That was in the 90s. I have been back every year, and I have still yet to come across a school of herring big enough for a seiner to even set on. It took seven days for years of herring to disappear. To me, that's ludicrous.

We definitely need observers on these vessels 100%. I am not a big seal lover because I am a fisherman. And I know for a fact these boats are not just catching herring. They are catching seals and whales. I know a friend who went out on one of these boats on an overnight trip. They caught 400-500 seals. They couldn't pump the herring because seals were clogging the pump. I dislike seals, but that's still a brutal way to go. There's so many things that these observers – If I had an observer on the boat, and I was going to catch herring, the last thing I would do is fish if I knew there was more herring where the seals were. When the observer is off the boat, who cares about the seals as long as I make my million dollars. There are so many factors that you guys don't know about, that science hasn't seen, but the fisherman have. I totally agree on the observer situation. These guys fish night and day around the clock. I haven't bought herring to go lobstering with for years because of this. I buy frozen bait. I don't believe in it. It's too bad too, because the seiners are nothing like that. They only fish at night. Years ago, on Cashes, they could fish during the day because there was that amount of herring there. I haven't' seen that type of herring fishing like that for years and it's too bad. I definitely support the observers. And if we let the boats go into the groundfish areas, if they are closed for groundfishing, that should be a herring sanctuary also.

New England Fishery Management Council
~~Tannery Building 50 Water Street Mill 2 Newburyport, MA 01950~~
Holiday Inn By the Bay, Portland, Maine
- Kennebec - Lincoln

3.21.12

ATTENDANCE SHEET
Travel Authorization # 12-48

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 21, 2012 LOCATION: Holiday Inn by the Bay, Portland, ME

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Grout	PAGE 1 of 4 3-21-12	
Paul Howard		
Chris Kellogg		
Lori Steele		
~~Talia Bigelow~~		
PETE SPECKES	25 WOODSTALL DR SCARBOROUGH ME 04074	207 838 0165
Chuck Sgarzi	20 Graham St. Biddeford	207.838.8824
Stephen Robbins	44 Wood Point Road Little Deer Isle ME 04650	207 460 7415
JOE MARTERULLE	116 Falmouth Rd Windham ME 04062	207-310-1191
Robert F. Lyndrick Y/C/Ket Lane	Sr. Chatham MA	774
John J Conneely.	204 CHADWICK RD BRADFORD MA 01835	9783045164
SHAWN TIBBETT	1655 POST RD WELLS ME 04090	207 604 6958
MEGAN TIBBETT	↓	↓
BRIANNA TIBBETT		
MIKE FAULKINGHAM	74 N. MARRINER ST. SOUTH PORTLAND, ME	207 838 7980
MATT Gaudy	33 Church St Scarborough	885-3540
Garon Mailman	70 old orchard Rd Saco ME 04072	207-229-3780
JOHN BERGERON	8 RIVERSIDE DR. BIDDEFORD	207-590-1659
Kevin Ford	10 Blue Heron Dr. Kennebunkport	207-351-5733
Saco Bay Tackle	977 Portland ME 04072	2544453

New England Fishery Management Council
~~Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950~~
Holiday Inn by the Bay 3.21.12

ATTENDANCE SHEET
Travel Authorization # 12-48

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 21, 2012 LOCATION: Holiday Inn by the Bay, Portland, ME

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
Jesse Field	41 Howard St #2 Portland 04101	671-6554
Rich Ruais	ABTA Salem NH	
GARY O'BRien	123 JORDAN AVE SO. PORT	329-0080
Mitchell Napolitano	27 Fillmore Ave. S.Port.	615-5532
Mike Campbell	38 Foxcroft Ln. Arundel Me 04046	207-205-1113
Kurt Jon Stevens	9-12 N. Ivy River Rd Jefferson Mt. 04348	207-787-3167
Michael Pierantoni	67 N. Village Rd 03907	207-361-1029
John Pappas	44 STONYBROOK ROAD Cape Elizabeth ME 04107	207-318-9449
DAN GREER	145 SCITUATE Road York, ME 03909	207-351-1237
DAVID REED	126 HIGH LANDING SCARBOROUGH, ME 04074	207-650-2505
Peter Petit	200 First ST Biddeford ME 04005	2827305
GARY OBRIEN	653A COMMERCE ST. PORTSMOUTH NH	603-317-1864
ROGER FLEMING, ENVIROJUSTICE	1047 PEABODY RD APPLETON ME 04862	978.846.0612
Doug Grout	178 Elm St. Springvale ME 04083	207-459-0123
TIM GREER	YORK HARBOR, ME	603 200 6290
Sylas Haton	Bristol/Sylas.Haton@Hotmail.com	207-465-5511

PAGE 2 of 4
3.21.12

Holiday Inn By the Bay Portland, Maine 68

3.21.12

Name	Address	Telephone
Steve Weinle	12 Jackson Rd, Andover, MA.	
Donald Simmons	P.O. Box 144 Friendship Me.	1-207-542-3613
Hank Greer	145 Scituate Rd York, Me.	207-351-1237
James Mosdy	72 Woodside Meadow Rd York ME	207 363 5714
Mike Horning	Cape Neddick, ME.	337-6450
Lee Benoit	11 Harbor St Scarme	831-1482
Michael Pete Morse	219 Kennebunk road Buxton, Me	207 939-2713
Dave O'Connell	216 Mitchell Rd S Portland	799-2265
Russ Browne	7 Island View Road Cape Eliz	799-7216
Peter C Murmouras	503 Elm ST Biddeford me	207-282-2231
Benjamin J Welch	24 Welch Ln Arundel	207-590-9095
TOM RUDOLPH	4189 SE Division ST. PORTLAND OR	503-774-8056
MIKE LORUSSO	P.O. Box 774 Gloucester MA	01931
Lou Goodreau	NEFMC	978-465-0492
Chris Weiner	CHOIR/ASTA	

New England Fishery Mgt. Council

Attendance Sheet

Authorization #12-48

Herring Amendment #5

Public Hearing

Name	Mailing Address	Telephone #
CAPT SHAWN TIBBETT	1655 POST RD Wells ME 04090	604 6958
Capt Michele Pluvade	PO Box 3452 South Portland ME 04116	272-0549
Deane Gour	4 wilderness way Scar	671-3176
Keith Jordan	522 Ocean House Rd Cape Elizabeth ME	799 6718
Tyler McLaughlin	77 main St. Hollis, NH	603 8609010
Sean Mahoney	186 Falmouth Road Falmouth, ME	781 8475
JAMIE COURNANE	UNH / HERRING PDT	
JOEL STORUK	268 DANIELS RD UNION ME	04867
[illegible]	Hyannis MA	781-771-8374
BRIAN CURRIER	20 EMERY RD. STANDISH, ME	232-5905

New England Fishery Council

Herring Amendment 5 Public Hearing

Attendees 3.21.12

Holiday Inn by the Bay

3.21.12

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Radisson Hotel Plymouth Harbor
Plymouth, Massachusetts
March 27, 2012, 7 p.m.

Hearing Officer: David Pierce
Council Staff: Lori Steele
Attendance: see attached (approximately 90 people)

Dr. Pierce introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Gib Brogan, Oceana: I have been a herring advisor for the Council since 2003. It's great to see that we are finally getting around to answering the questions about what is necessary to monitor this fishery. I think everybody knows that need reliable, timely data on catch – landings and discards in this fishery – to effectively administer annual catch limits. We have seen two areas this year with rapid catch, and lags in data and reporting isn't acceptable in this fishery. We need timely information that is both accurate and precise, and those are two very different concepts. Precision gets most of the attention as we talk about the standardized bycatch reporting methodology and CV levels, but accuracy is the name of the game when we talk about quota monitoring and looking at bycatch. This is something that the Fisheries Service has advised. We need accurate monitoring for ACL enforcement, and SBRM is inadequate for this purpose. The SBRM itself, when it came up with the 30% CV, said for quota monitoring, it is insufficient for the cause. We sent this out and asked questions about what does a 30% CV mean for catch levels? The simulation model came back and said we could be looking at plus or minus 100% of the true value. Bumping it down to a 20% CV, we are still looking at plus or minus a 50% level. So when we talk about quota monitoring, we could be shutting down the fishery way too late or way too early, which has serious implications. So we need to have strong, accurate information about this fishery to make the ACL process work.

In looking at the current range of alternatives, it seems that the only one that meets this and provides the accuracy that everyone needs is the 100% alternative in the document now. Short of development of something else that meets performance standards for accuracy and demonstrates that you can collect accurate information, 100% observer coverage is the strong and the only acceptable alternative in the document right now.

In terms of the funding, I believe that mixed industry and agency funding is the way to go, but we need to put in safe guards. The Agency, in the past, has put in flexibility and latitude and discretion on how it deploys observer coverage. When we go into a partnership between the

Agency and industry, that flexibility can be manipulated, and the standard of coverage will be compromised. Something the Agency has referred to in the past is "external operational constraint," meaning that a shortfall of money in their federal budget has let them put in an insufficient number of observers. That is now acceptable. We need to have the standards and an understanding that If the Agency doesn't have the money, the industry will pick up the shortfall. That should be clearly spelled out in the document, in terms of how it will work every year and the constraints in the federal budgeting process. Those should be ironed out. There can't be wiggle room in there.

In terms of the ESA listing for river herring, we are anticipating more information on that in November before this is implemented. After being involved in both ESA and fisheries for a while, I think it would be in the best interest of the Council, Agency, and the industry to put their best foot forward as we go into potentially a Section 7 consultation. We have been advised by the Agency in the scallop fishery that if you are going into a new consultation, any actions taken leading up to a new consultation, like the strong actions in this amendment, can be considered in that consultation. So to keep the remedy under ESA as reasonable as possible, taking strong action now is in the best interest of the fishery. To that end, we support a bycatch cap, either regionally or coastwide. Then, let the industry sort it out, very much like the scallop industry has done. The hard backstop is the way to go.

Rich Antonino, Plymouth MA: I own a charter fishing business out of Green Harbor, MA. I support CHOIR and all their recommendations to the Council tonight. I am 100% behind them.

Michael Pierdinock, Green Harbor MA: I am a charter boat captain and officer of the Stellwagen Bank Charter Boat Association. I support the items set forth in the letter presented to the Council from the CHOIR Coalition.

Carol Carson, Marine Biologist, President of New England Coastal Wildlife Alliance: We need to ensure the continued existence of important forage species like river herring and shad and ensure their consumption by other marine wildlife. Forage species in New England waters directly support various commercial and recreational industries like whale watching and recreational fishing. The loss of these species will have lasting negative impacts on the industry, both large and small, and the revenues they generate the jobs they create in our New England area. Therefore, we feel it is important to:

-Set an annual catch limit or cap on the total amount of river herring caught in the Atlantic herring fishery

-Ensure there is 100% at-sea monitoring on all midwater trawl fishing trips, with one observer and better yet, two

-Enforce that there is no herring midwater trawling in areas established for groundfish rebuilding

-No release or dumping of un-sampled catch except under exceptional circumstances such as mechanical failure or when safety is a concern, and an accountability system to ensure that exceptions are not abused.

Steve James, Green Harbor: I am a Charterboat captain for Green Harbor, President of the Boston Big Game Fishing Club, and I run the Monster Shark Tournament. I sell herring oil. I was the largest distributor herring chum in the State some time ago. I switched over to menhaden. I am involved in the distribution of bait and chum. I am here to represent interests of Green Harbor Tuna Club and the Stellwagen Bank Charter Boat Association and the 130 members we represent, which are charter boats from the South Shore predominantly.

I would like to suggest that we need to improve observer coverage and put effort controls in place for bycatch that we are seeing out there. None of my organizations want to see commercial midwater trawlers put out of business but need to see efforts to clean up fishery. It's an antiquated process in relation to where we should be at. It's by no means an artisanal fishery at all, it's a very mechanized process at the industrial sweep level. With that said, I drafted a letter, and I will run through the options quickly:

Section 3.1.5 Option 2 – dealers have 100% accountability for all fish

Section 3.2.1.2 Alternative 2 – require 100% observer coverage. This is a very important step to cleaning the fishery up.

Section 3.2.3.4 Alternative 4D Closed Area I Provisions with trip termination – we suggest five events.

Section 3.3.5 Impose a cap on the total amount of river herring. One percent of the entire bycatch of the fleet is going to ruin herring, and it constitutes a tremendous volume in terms of gross tonnage.

I would like to ask for a quick vote – a show of hands of people here this evening that endorse the CHOIR letter that has been drafted. These people endorse the position not only by CHOIR, but also Honestbycatch.com, as there is virtually no difference.

(About 60-70 hands were raised, about 75% of audience)

I would conclude that of the 80 or so people here right now, the vast majority raised their hand supporting the CHOIR position.

Alex Mansfield, Jones River Watershed, Kingston: Just for the record, I didn't raise my hand because I hadn't read the letter, but that doesn't mean I don't support the suggestions.

For 25 years, our organization has been doing advocacy, stewardship, and restoration work in our watershed and on the South Shore of Massachusetts. That includes water quality work, flow advocacy, and habitat restoration. We consider that river herring are key indicator species. If river herring are doing well, then all the other things we have done is doing well too – water quality, flow, access, habitat. The work we are doing includes dam removal. We were just successful in removing the dam Jones River last fall. We are working on another one. Those projects take an enormous amount of effort on our part, and our funders, including DMF, the Towns of Plymouth, Kingston, NMFS. We are talking about help at the state and federal levels. We have a volunteer base of over 100 people that do herring counts in the river and keep track of river herring. It generates data used by the state and our organization.

Then, we look at offshore bycatch numbers that totally overwhelm the river herring population in the Jones River. We know we are doing our part in terms of inshore habitat and spawning

restoration, and we are asking the Council to support the adult and juvenile life cycle stages at sea.

I think that the catch limits proposed in this document are too high. Even to reach these catch limits would wipe out every herring run in Southeast Massachusetts. I know you are not looking for new suggestions, so we support your best proposed catch limits and 100% observer coverage.

Kurtis Maxon (sp?), Green Harbor Charterboat Captain: I am a charter boat captain out of Green Harbor. I am also a member of Stellwagen Bank Charter Boat Association. I am also here to represent the Northeast Tuna Club, 117 members strong. We are in favor of alternatives specified by the CHOIR letter. Everything else I had written down, Steve stole my thunder. Thank you for your time.

Robert Fitzpatrick, Maguro America, tuna dealer: I will "ditto" some of the CHOIR stuff: 100% observer coverage. Keep them the hell out of the groundfish closed areas, don't let them in at all. Regarding enforcement, weigh the fish.

It seems like very few people ever say wow, there's a lot of herring. Tuna fishermen throughout the Gulf of Maine and east of Chatham in the fall – there is no bait. When we continually check the herring dipstick and there's nothing on it, I wonder if perhaps some retrospective analysis of what might have occurred to cause this problem. The purse seiners couldn't catch half of the "Mickey Mouse 27,000" last summer, and they are state-of-the-art boats, not the mom and pop stuff that used to catch 40,000 a year. There were some fines handed down in Scotland this month to 20-some odd midwater trawlers, ironically. They had a good system of weighing the catch with government observers and auditing of the dealers. But these vessels in Scotland took $75 million too much herring and mackerel in a three-year period. Bill Overholtz, who I would say is the "Godfather" of the herring disaster that we have, with his mega tonnage biomass that we used to think we had, he told me that if 20% of the catch is getting dumped under-reported, or not reported, you will lose the fishery. It appears that maybe that has actually happened, that we have lost the fishery. There are places where there were discrete spawning stocks in the Gulf of Maine that are just not there anymore.

I asked in Portland about the hailing from the vessels, if it always matches the offloading dealers numbers. I was told that it is close. I can imagine that is probably true. Does anybody ever think about perhaps auditing the sell side of the dealers, not to make criminal cases against people, but to see what has happened. 20% under-reported or un-reported, you are going to lose the fishery. And it is apparent that we have lost the fishery. Maybe we should look back at the sell side of the dealers, see what they sold. It would be interesting to see what's really happened in the fishery.

John Richardson, Hingham: I am supporter of CHOIR for a number of years. I have read their February letter, and I am very much in support of the changes suggested in that letter.

I really feel that if the elephant in every hearing room in this program is the part that is least talked about, and that is the standard of success of maximum sustainable yield. I think that when a single fishery is managed, and the abundance of that fishery has so much impact on the abundance and location in the Gulf of Maine of so many important predator species, then the standard of single species sustainable management is inappropriate. If I am right, then with all this effort, if it becomes a perfect effort, it can be successful in achieving a successful fishery,

sustaining river herring, but it can also be horribly unsuccessful in achieving enough of these forage fish to make the predator species also successful and keep them where they are supposed to be. My suggestion would be not so much with the proposals that are here, although I do support the CHOIR changes. I would suggest to review your target, the maximum sustainable yield of a single species and its appropriateness for this kind of management.

Ralph Pratt, Marshfield: I am for 100% observer coverage. I think counting the fish is important, but observers also play an additional role. They are a deterrent in interactions with bycatch. That's why you need 100% observer coverage on all the boats. Any time you have a gear type that can interact substantially with non-target species, and observer might – if they are not there, it's going to be anything goes. But if they are there, there is some control on that, I believe.

Shane Yellin, fisherman: I would like to see 100% observer coverage. I agree with everything CHOIR has written. As far as the cap on the catch triggers, those numbers seem really high to me. I agree with the previous gentleman who spoke. We need to preserve river herring. They are in serious trouble and may be on the endangered species list soon. In that spirit, I would like to cite the case Flaherty vs. NOAA/NMFS and ask for expedited execution of these amendments as soon as possible, not waiting until 2013 when they are passed this year.

Dean Clark, Stripers Forever: I represent Stripers Forever, a coastal conservation association made up of over 17,000 members. We support the CHOIR proposals. I would recommend that instead of valuing the fishery based on maximum sustainable yield, do it based on maximum sustained value. Right now, you are under-valuing these fish. They are more valuable economically as a forage fish than they are as a commercial product. I would ask you to consider revaluing these fisheries, not just the herring fishery, for their long term and effective value to other fisheries, and how they inter-relate with one another. Instead of species management, eco management instead, or a full environmental management program.

We want 100% monitoring, and we believe in catch limits. We think that the triggers on river herring are set way too high. They ought to be much lower, they should be more conservative. Many people in Massachusetts will tell you that river herring are going the way of the anadromous white perch. In many of the streams, they have already been extirpated. We don't want to see that happen. This is a river herring fishery that is not only in decline, it's in desperate need of better attention and less harvesting.

(Shane Yellin seconded Mr. Clark's comments about maximum sustained value.)

Chris Weiner, bluefin tuna harpooner: This is my fifth or sixth hearing. I wasn't going to talk, but since so many people have supported the CHOIR thing, I wanted to get on record what exactly we are asking for. I don't think we have submitted the letter yet. The first thing we are asking for is 100% observer coverage. A lot of us got involved in this battle for a reason, and while we don't get into all the details of what has been seen, heard, and told to us by crew members, we are very sure that this is not too much to ask. It's a very important thing to have on boats like this. We often get told at these meetings that if we are going to do this, the C and D boats should do this too. You can fit 10-20 D boats into some of these boats. There is no comparison between these 15 boats and any other boat around. I don't think that 100% coverage is unreasonable.

The second monitoring aspect we are looking for is involving dumping or slippage. We prefer to call it dumping. We believe that after 10 events of dumping per area, there should be trip termination. So for the crowd, that means that if you have the four areas, and the boats go out to a given area, and ten different times, they dump. After that point, if a boat dumps again, they go to another area or they go home, bottom line. There are exceptions built into that. The reason for that is because everyone in this room that has ever been around these boats knows that dumping occurs. You might as well not have observer coverage if you are not going to address the dumping. It's important that you have both of those. This gear type is different than any other gear type. Where a groundfish boat brings the net on board, save for a few rare occurrences when a bag is too big and they have to find a way to get it out. The main reason we are fighting this is because if you look at how one of these boats operates, it pulls a 500 to 800 thousand pound net up alongside and pumps it in. If they don't like what's in there, they can easily let the catch go, dump it, slip it, whatever you want to call it. Both of those things should be on A and B boats. That's a critical part of our letter. Over the last four years, representatives from certain parts of the industry have tried to rope in every single little dragger, every tuna boat that has some kind of herring permit, and that was never the intention. We are hoping that those two rules apply to the 20 – well it's 40 boats – but it's really 12 to 15 boats that actually go out and catch it all. That's A and B boats only. We do not believe that C and D boats should be involved in those two points.

The third part of the letter is the boats should be removed from the groundfish closed areas. I don't see how that needs much explanation when you are talking about small mesh being towed at 5 or 6 knots by pair trawlers.

The last thing is find a way to weigh the catch. That doesn't necessarily mean you weigh every single fish. Just find a way to have some kind of verification, third party, whether it's the dip-sticking that Peter Mullen talks about or some way. Just looking at the net, as good as the captain may be, I don't look at a tuna and go 300 pounds, and that's the number that gets written down, even though that fish might often be 300 pounds, it could be 320 or it could be 280. When you are talking about hundreds of thousands or millions of pounds, mall differences can add up a lot.

Those are the things we are asking for, and we hope that the Council will make the right decisions. When I tell people that we have a herring meeting, they say "are you going to ban them yet?" That is the natural reaction – let's get rid of the gear. I think most people don't see it to be very unreasonable for a fishery made up of 12-15 boats catching almost 100,000 tons, it isn't too much to ask to have rules similar to the rules that would be on them in any other part of the country. There is a reason for these packed rooms. In our fishery, we have been really impacted by the lack of herring. All of these things add up to how healthy the herring stock is. We don't think that this is unreasonable.

Steve Marr, Senate President Murray's office: I am here to listen to the concerns of people. She wants to make it clear that the fishing industry is very important to the Commonwealth, in her district and across. It's important to have hearings like this to hear from the fishermen themselves, the people with the most vested interest. Any concerns you have, anyone in the audience, feel free to talk to me afterwards.

John Rice, commercial fisherman, Cape Cod: I don't think that any of the proposals for river herring will do except the closed areas. I like Alternative 3. I don't like the idea of waiting until we have caught whatever we think we caught, and then let's see for another year if the river herring will come back. All of the sport fishermen, recreational guys, charter guys, and everyone who has suffered through the moratorium has suffered enough. Taking more chances with this species is one too many chances.

Dave Kraus, Charterboat Captain, Scituate: I would like to address some things that are not in the amendment but really need to be said. I don't think the amendment goes far enough. The catch cap on river herring is so high because we are dealing with an industrial fishery. The catches are so high that even observers observing thousands of fish going by a minute are not going to see river herring. The way the operation works doesn't allow adequate observance of what is going on on the boat.

I would like to see all the pair trawlers go out of business. Canada banned it 35 years ago, and they have a great fishery now.

Bill Henderson, Charterboat fisherman, Hull MA: I am part of Stellwagen Bank Charter Boat Association and Green Harbor Tuna Club. I support the CHOIR changes. I will speak from a fisherman and charterboat captain out there for the last few years.. When you talk about forage fish, I just don't see them. When we target tuna, when we target stripers – without these fish, the fish aren't there for me to target. Whatever the best way to get this fishery back in to a better stock would be great. I also ask – when we talk about stock assessments and about getting a good handle on what is there and what is not there – it would really be appreciated. How do we know what is there and what we might be doing to the fishery if we don't have the data to make the decisions on? I would love to see these fish come back.

Wendy Paquette, recreational angler, Cape Cod: Regarding Section 3.1.5 – reporting requirements for federally-permitted dealers. Currently, the captains estimate tonnage of their catch, as does dealer. I urge the Council to consider Option 2, which would require federally-permitted herring dealers to accurately weigh all fish.

Doug Brander, Charterboat captain, Hull MA: I am a member of Green Harbor Tuna Club, Stellwagen Bank Charter Boat Association, New England Charter Captains Association, and I support CHOIR recommendations. Over the past 30 years, I have seen a large decline in the amount of bait, and we rely on it. The business relies on it. Whatever bait seems to be left, the dogfish seem to be eating it. The river herring was also a family affair, and I would like to see it come back.

Alan Assbaka, Charterboat captain, Chatham: I am also a tackle manufacturer. I support CHOIR. I have a real problem with the vertical integration between the boats and dealers. I am in the tackle industry, and I can't be vertically integrated. I have to pay tax through sportfishing excise tax. With these guys, the left hand can sell it to the right hand, and there is no accountability at all in any level. As a tackle manufacturer, my company can't be integrated for sportfishing excise tax. A fishery is a fishery, and it's crazy that I have to be put one way, and someone else is allowed to be vertically integrated because they are a big business. I think it's complete bullshit.

Rich Buckley, recreational fisherman: I fish from shore. I am a member of the Mass. Striped Bass Association, and I support the Honest Bycatch recommendations. I just want to make a couple observations. I am retired now, and I fish from shore. I run into a lot of people. There aren't the forage fish around from shore that there were a while ago. I have heard about big feeds regarding river herring, but never seen it. I have run into "peanut bunker blitzes" from shore. It's a wonderful thing, but I didn't run into a single blitz last year. Also, a few years ago, there were a lot of tourists fishing from shore, people from New Jersey, New York, Canada, and you don't see them anymore. Finally, I would like to say that it's hard to get young people involved in fishing now because there is just not much opportunity to catch striped bass from shore as there was a few years ago.

Steve Gettle, tuna fisherman, Green Harbor: As a tuna fisherman, I have seen impact of these midwater boats in our traditional tuna areas. They come through, and after that, the tuna leave, it's pretty simple. I am happy to see that you are considering 100% observer coverage. These are high impact boats and can do a lot of damage if they are not watched. They are industrialized fishing, and they need it.

I don't think that boats should be allowed in groundfish areas. If you are trying to rebuild groundfish in these closed areas, why let a boat go in there and take the forage out? It doesn't make any sense to me.

I would like to see dumping limited to extreme cases where the crew safety or boat are in jeopardy. To willingly dump fish because you don't want them makes no sense to me.

Putnam McLean, tuna fisherman, Marshfield MA: I support the observer coverage. This past summer, I saw pair trawlers working west of Stellwagen ten miles east of Marshfield. I don't remember seeing them before so I don't know what sampling has come from that area, but they may have been there at times. I stopped and watched them pump out. I saw a significant amount of dogfish being discarded overboard. I didn't stick around and watch the whole pump out. I was looking for tuna. Other places off Chatham, I have seen significant discards of great big cow bass. There were some videos this summer of striped bass as well. I don't know what provisions there are for discards of these other species. Clearly, running big nets through some of these areas where you have other species besides groundfish would be problematic. I can't imagine running those big nets around Stellwagen Bank without running into lots of striped bass, bluefish, or who knows what else. There is no end of things that we don't want to see happen.

Patrick Paquette, Massachusetts Striped Bass Association: We are submitting lengthy comments, but I want to continue to bring up a couple of points.

We will oppose the SMAST option because we believe that it has now proven on its own website that it did not work. It is supposed to be a river herring prevention program, and there were three large river herring bycatch events this past winter that happened over five weeks in a relatively close area. My assumption is that the program failed to prevent multiple river herring bycatch events. (Dr. Pierce asked about the bycatch amounts.) You can't get the details. We called and were told the details would come out in the report. They are large events by their own definition.

We would urge the Council – in the beginning of the river herring section, it states clearly that the options in the document can be combined. We believe that whatever protection or monitoring options the Council chooses, the only way they will work is if the Council exercises its right to set a river herring cap. There is a cap in this document, and there was a cap in Amendment 1, so it can easily be done. Based on the way that other caps have been set by the Council, especially the haddock cap in this fishery, this does not have to be a cap based on biological effect on river herring. It will not be difficult for the Council to come up with a river herring cap in this fishery based on recent catch, in a similar methodology to what they did with haddock bycatch.

One other major loophole that we continue to get back to, and hopefully it will be addressed by our State representatives, is this loophole of allowing operational discards to not be counted as slippage events. Operational discards are what is left in the bag after pumping operations. However, I do not see in the document any limit to the size of what that is. Whether that is a test tow that comes up with a bag full of bycatch that is too large because maybe it has a mammal or a turtle or something that shows a shape on an expensive sonar machine that shows we don't want it seen by the observer. We decide that's an operational discard after a test tow, and we can release it subsurface where the observer cannot see. The color of a turtle or mammal in the water inside a net with a 15-minute tow of fish through a mixed species of herring during a predation event is easily hidden when you dump it. I believe you saw the video that we sued the Observer Program for under Freedom of Information. It showed the net from the side of the deck, in the video shown in 2010, and it was clear that the observer cannot see into the water to identify small or large amounts of bycatch. The way the rule is written now in the document, operational discards, amounts of fish left after pumping that cannot be shown to the observer, don't count as a slippage event. If the observer can't see it, it has to count as a slip or a dump, as a dead discard. As a recreational fisherman, I am being charged with every haddock I release as a dead fish. We are being charged with this. It's part of what is going to hang us this year with the haddock numbers. But this fishery can release what it doesn't want on deck. This is a clear loophole in the dumping proposal. If operational discards are not slippage, then what is? We have safety exemptions, dogfish that can't be pumped, and that should be. The Closed Area I rule is proving to work. The Council has the data that the Closed Area I rules are reducing dumping. And, there have been no more than 1 or 2 cases in Closed Area I where it was determined a safety issue. It is clear that the Closed Area I rule is not the safety hazard that was a big concern going into it. The big thing now is that the Council does not let the operational discard loophole happen. If the observer doesn't see it, it should be considered a slippage event. To call it monitoring and leave that loophole of the undetermined amount – it could be 100 or 10,000 pounds – we don't know how much it can be. I need to know where the striped bass that are floating around when these boas are around come from. We don't see the observer reports of lots of striped bass, but they fish the same areas, and we continue to see videos where it's mysteriously coming from. We know that there are big bodies of striped bass along the backside of the Cape. These boats arrive in August, and the bass are gone. But we don't see observer reports of striped bass, but we hear the stories of the slicks of all kinds of fish, including groundfish and pollock. On the water, people are seeing it over and over again. This is why these boats need the observers. To leave the operational discards loophole in the slippage rule, throw the whole thing out. What's the point if we are not going to capture it?

John Dewayne, Wellfleet MA: I am a fisherman and I volunteer for a herring count. We have been doing the herring count for three years, and the numbers have declined every year. That's a big concern. When I hear the numbers of bycatch of what can be caught by midwater trawlers, that exceeds what we see up our river any year, and that's alarming. I also don't hear too many people mentioning the status of the stock of Atlantic herring. I'm not educated about that, but my sense is that the midwater trawlers can take too much of them. And I would be concerned that the population of Atlantic herring could be going down too, just like it has with menhaden. Herring and river herring are both important as forage fish, and I think that should take precedence over the commercial needs for bait. They are important to the ecosystem too. There are three items in the amendment that I support:

-3.2.1 Alternative 2 100% observer coverage on every limited entry boat and ensure accurate accounting of bycatch and slippage

-Section 3.2.3 Option 4D, which deals with slippage

-No midwater trawling for herring in groundfish closed areas, which is 3.4.4 Alternative 5.

Doug Amorello, tuna fisherman, charter boat captain, lobsterman: The observer coverage is the biggest thing that needs to be addressed. I saw the video that was showed to the Council. The girl is down below trying to count herring as they fly by by the millions, and there are guys by the grate just picking haddock off the top and she doesn't see it. We have full accountability in the groundfish fishery. These guys need to bring their fish in too. Other than that, I agree with CHOIR statements.

David Mussina, Medford MA: I live in Medford, and that makes me part of the Mystic River Watershed. You have seen me taking pictures and coming to meetings, mostly to educate myself on this issue. I am doing a documentary project. I have come to discover that river herring is a key issue, as part of the ecology of the watershed and it also ties us in with the ocean. A couple of things haven't been mentioned that relate to the importance of monitoring and the importance of a catch cap.

The plankton that the river herring feed on is in serious decline in the oceans. There has been about 40% loss since the 1950s. This is the food that the river herring depend on. We are losing some population because of that. On the other end, the fish that come into the watershed have a high mortality rate. They are a forage fish. A number of the adults don't make it depending on the watershed and length of the run. And that's part of the bigger picture. They are a very important source of food for our fish and birds. And a lot of the young herring also don't make it. I have heard figures as low as 1 percent. So there is loss on both ends, and then put in the midwater trawling, and that hammers the whole picture.

I am grateful that you are looking at this. I was encouraged to hear in Gloucester that the midwater trawl industry wants coverage. They feel they are being called on about a lot of things they are not doing, and they would like to have some documentation as to what is really happening on the water. That is very encouraging.

I think we also need to have a record of what comes in. I think we need to have the weighing of the fish and a record of what comes in on shore. That's part of the monitoring. I am concerned that we need some kind of a cap. I understand that you need more data and we need a stock assessment. My one concern is that when the stock assessment comes in, it will postpone putting

a cap in place for another two or three years. I am hoping that within Section 5.3.3, that you can put in place a cap based on what you know now and then have that transition into the stock assessment. I do feel that based on the factors I mentioned earlier – loss of food by the plankton, the high mortality rate in our watershed – that we don't have a lot of time left to wait, and something needs to be done. I hope that does happen. Thank you for your work.

Putnam McLean, tuna fisherman, Marshfield MA: Just thinking about the process of observing, there were so many dogfish being sifted out through the pumping process, it almost seems like the observer would have to just count those and nothing else because the crew is just pitching them over the side and most of them are dead. There was other stuff mixed in, a few squid and other things like that.

The other thing about the component of the catch that struck me is that these weren't really what I would call larger herring. These were medium herring, smaller ones. I suppose there is a sampling process for that because if you are looking at gross tonnage of what they are catching, the mortality rate is probably double what it would be if you were catching a fully mature herring, versus these next size, whatever year class they are. Obviously, the mortality rate targeting those and catching umpteen million tons, you would have caught twice as many fish. I suppose the sampling would be really important to know what the component of the catch was if it was all made up of 7 or 8 or 9 inch herring, versus 12 inch herring. It really is a daunting task to observe them unless you bring all of them in. I don't know how they can all be counted.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-49

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Tuesday, March 27, 2012 LOCATION: Radisson Hotel, Plymouth, MA

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Pierce		
Paul Howard		
Chris Kellogg		
Lori Steele		
Talia Bigelow		
Rich Tavolino	4 Sharp Hollow Dr Plymouth, MA 02360	508-830-3193
John Richardson	10 Ringbolt R Hingham MA 02043	781-749-9592
Ron F Valicenti	12C Iron Hill S Weymouth	
Shane Yellin	11 Clover Circle Dover Ma	6172564728
John LeBlanc	166 Lexington St Waltham MA	781-891-9366
GARY BROGAN	OCEANA	
Jeff Douglas	7 Bryce Ct Kennebunk Maine	207-967-6267
Craig Wells	59 Temple Pl #1114 Boston, MA	617 728 0500
John Pappalardo	Box 3174 Wellfleet 02667	508 737 2211
MICHAEL PIERDINOCK	P.O. BOX 732 BRANT ROCK 02020	617 241
Stephen Chotkowski	84 Merrimac Dr E Falmouth Mass	508-539-3674
DON CIANCIOLO	28 CHAPAQUOIT WAY, E. SANDWICH MA	508 888 4033
Patrick Sears	44 Packard Ln. PLYMOUTH, MA	02360
Nathan Matthews	27 Winston Ave Bourne, MA	02532 774-269-5347
GREGORY JACKMAN	12 BRADY LANE, MA	01757 508 478 0778

Peter Murphy	82 Standish Ln Marshfield MA	Tel 781-834-7104
Abigail Franklin	5 Beach Rd. East Sandwich, MA	781-775-7967
Sean Murphy	73 Lake Shore Dr Marstons Mill, MA	774-238-1398
Richard Buckley	44 Maplewood Ter / Braintree MA	781-843-7009
Robert Rushford	325 Long Pond Rd Mashpee MA	MH 508-428-1556
John Rice	325 Long Pond Rd Mashpee MA	MH 508-428-1556
Stephen Maher	Senior President Thomas Murray	Agent MA
Beth Casoni	The MASS. Lobstermen's Ass.	Scituate MA
Danny Hunter	Cypress St	Plymouth MA
Doug Amorello	60 Standish St	Pembroke MA F/V SASHAMAY
Jamie Cain	17 Cole Ln	Plym
Lafayette Tupper	275 Blackfish Dr Plym MA	508-747-3103
Curtis D Mixon	57 Rock St Norwood MA	781-630-0066
John Miscusky	23 Walnut St Douglas MA	508 476 1036
ROBERT D. SEARZI	120 MAIN ST. KINGSTON MA	781-585-6995
Max Chapman	150 Spring St. Mansfield MA	617-823-2927
Rudy Amaro		603 898 Tuna
Robert Fitzpatrick	9 Bellevue Ln Scituate	508-364-0553
NICK [illegible]	68 NEW BEDFORD MA	508 991 8448
Ralph Prat II	Marshfield MA	781 829 7297
RORY O'DONNELL	NEWPORT, RI	781 413 6171
Corey Carlson	Scituate Ma	860-830-1652
Jeff Weber	Mansfield MA	774-266-3841
Putnam Madeira	Marshfield Ma	781 834-7584
Gordon Neal	Plymouth, MA	508-224-2230
David Kraus	Scituate MA	617-460-0501
Steven James	Marshfield MA	781-834-2895
Capt "Kirk" Carlson	11 Clarence Soule Drive, Middleboro MA	508-566-0004
Chris Weiner	ABTA/CHOIR	
Steve Weiman	ABTA CHOIR	
Doug Brander	Hull MA	617 967 2223
Bill Henderson	Hull MA	617 755-4692

Victoria Lovell 10 Shady Acre Lane Pembroke MA 781 826 5665
Ken Lovell " " "
Steve Gatto 614 Main ST Norwell, MA 02061
Colin Cunningham 15 Hill St Cohasset, MA
Raymond Kane Chatham, Ma.
Patrick Mooney 286 Forest Grove Ave Wrentham Ma 02093
Adam Prindall 31 Mirror Lake Ave Norfolk, MA 02056
Matt Maher 2 Joyce Dr. Plymouth Ma 02360
Debora Hoit Box 1230 Marshfield Ma 02050
Claude Holt " " "
Alex Mansfield 14 Purittan Ln Marshfield MA 02050
Phil duBois 43 Elm ST Kingston MA 02364
MARK J. HURLEY 16 MAGOUN PATH, MARSHFIELD MA. 02050
Mike Sawyer 21R1 Nicks Rock Rd. Plymouth, MA 02360
BRIAN CURRY 8 Turner Run Plymouth, MA 02360
Fred Terry 2 Hummock Way Carver MA. 02330
Dave Clark 380 Worcester ST Shrewsbury, MA 01545
VINCENT BARUFFI 61 Maple ST Hyannis 02601
Tom Davis 1566 Main St Chatham MA 02633
Patrick Pimentel Hyannis MA 02601
Tom Vanderbeek P.O. Box 112 W Chatham 02669
GREGORY OWEN 128 PLEASANT ST. SOUTHPORT 02664
Bill Hoeger 99 Hanger Norwell 02061
DAVID MUSSINA 15 STURTEVANT TER WAREHAM 02571
Jason Mazzola Quampeagan Rd Cape Cod 02532
Richard Plummer 5 Monument Beach 02553
Matthew Connolly 7 Jacobs Landing Plymouth MA 02360
Chris Conway 7 Jacobs Landing Plymouth Ma 02360
Jackie McKay 25 Bartlett Rd Ply MA 02360
Peter Tavares 37 Queenslund Drive Marshfield

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-49

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Tuesday, March 27, 2012 LOCATION: Radisson Hotel, Plymouth, MA

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
ERIC BOLLES	45 CENTRAL ST HANOVER MA 02339	781-829-0062
Charles Maxcy	45 Richland Rd. Narragansett RI 02882	617-759-5284
JAMIE COLEMAN	UNH, 1 AH PDT	

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Hilton Garden Inn
Warwick, Rhode Island
March 28, 2012, 7 p.m.

Hearing Officer: Doug Grout
Council Staff: Lori Steele
Attendance: see attached (approximately 35 people)

Mr. Grout introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Ed Socala, commercial bluefin tuna fisherman: I support the CHOIR stance.

Paul Earnshaw, Buckeye Brook Coalition: The Buckeye Brook Coalition is a watershed organization in Warwick, trying to protect river herring spawn in our waters. I am providing a few brief comments to generalize where I am coming from and my utmost concerns. We will have further details and comments in writing, in addition to those I state here tonight.

Mr. Earnshaw read a written statement into the record (see attached).

Jim Ruhle, commercial fisherman, Wanchese NC: For the last five years, I have been in the herring fishery in Newport RI. I will submit written comments signed by a significant number of the local historical single bottom trawl vessels that have established the herring fleet over a long period of time. I understand people's concerns related to the river herring and predator prey issues. I think it's important to recognize that every time you do an analysis on any species, if you don't look at the current data, you don't get a representative sample of what the fishery actually behaves like. All my comments are backed up from observer reports, which make them the best. They quantify that I deal with less than a fraction of a percent of bycatch of everything with levels of fish from upwards of million and three quarter to two and a half million pounds. What I am going to prove through these documents is that if you fish responsibly, it's the second cleanest fishery in New England behind lobsters. There is no question.

I realize how emotional this issue is. But I also realize that the failure of river herring is not necessarily attributed to the bycatch of any fisheries. Our fishery in North Carolina collapsed 40 years ago runoff from farms and degradation of habitat. You can pollute a river with light and sound. That's all you need to run those fish away. Combine the demise of habitat in the southern areas with a significant regime shift north and east, you will find the alewives have moved north. Look holistically at this thing. You can't stop at the border between Canada and

the US. To get them back to the rivers where they once were won't happen in our lifetimes. Fish ladders don't work. There are a lot of issues associated with it, but the fault does not all lie in bycatch issues.

This document doesn't really talk about predator-prey per se. There aren't any options or alternatives, other than the river herring issue. It doesn't deal with how many herring should be left for prey or how many should be removed. My comment is that this needs to be analyzed not only to determine how many herring should be left for the tuna and whale watch industry, but what is the effect of too many herring in the ocean? We will never have a mackerel fishery back, and we will never have a significant butterfish fishery if we have an overpopulation of herring. They all eat the same food. When you have herring are wintering in the Gulf of Maine, there won't be a resumption of the levels of groundfish that were experienced when herring were at lower levels. Ecosystem management is a buzzword, it cannot happen in our lifetime, not realistically, and not if you are going to eliminate marine mammals from discussions. We can't get it right with single-species management, so how are you going to get it right when you are dealing with something as complex as the ecosystem. It has to be considered. So consider what the effects of an over population of a resource such as sea herring is across the board on other species. Use haddock as an example. The overpopulation of haddock stunted their growth where we as Council members had to reduce the fish size because the age of the fish was now to a point where they should have been 21 or 22 inches, but they were not growing because they lack food. When you have too much of anything, there is a problem. You have upset the balance of nature. In order to have an ecosystem approach, you need to be able to fish those levels down. When predator prey analysis is done, I am hoping that someone will look at it from both sides because there are two sides.

As far as the predator prey issues, when it comes to the southern New England herring fishery, it doesn't exist. There is no tuna in the area at that time, no significant amounts. There is no whale watching taking place that time of the year, and that's the time when I have my experience in the fishery, My comments are basically to that point. I will try to go through the document. I am only commenting on the measures that I feel are worth taking the time to comment on, or that I have an option or suggestion that I think merits consideration. I understand we are trying not to include anything new in the document, but the fact is I think it's time that you did do that. I am not trying to delay this. But I recognize the Agency can approve, disapprove, or partially approve an amendment. If there are four components to this amendment, and one or two of them need further analysis, you can pass the others and then at a time certain, once we have that information, we will revisit the issue. That's do-able. It won't delay the entire action. I think that is necessary because of the new data.

When you look at the Goals and Objectives in the document, on p. 4 (catch monitoring goals and objectives from public hearing document). 100% observer coverage, if an analysis is done that determines that 25% for the majority of the fleet is enough, is unrealistic and it's prohibitive. It's not necessary. My concern is not having the observers now, but what happens when it shifts when I have to pay for it. You can't afford it when you have a three-fold difference in cost per day for an observer from the east coast versus the west coast. It's unrealistic. It's a money-making scheme for everybody except for the poor observers and the fishermen.

Since Amendment 4, which has a lot of similarities to Amendment 5 (bycatch and the predator-prey issues), since 2008 until now, there is at least three years' worth of data with a very significant increase in observer coverage. You could analyze the data for those three years,

maybe four, and have a much clearer picture of how the fishery performs. To me, that is the best available data. Ten-year old data is useless. On top of the level of the observed trips and the dockside monitoring, you've got a much improved observer program that can identify species and they are not making the mistakes they were in 2003-2005 on what river herring were. It's still being worked on, but I have more confidence in the newer data.

For the observer coverage, I suggest that the Committee/Council request the PDT to do a technical analysis from 2008-2010 or 2011 on the performance of every vessel in the herring fishery individually, boat-by-boat. Establish three levels of criteria– low interactions, medium interactions, and high. It's my opinion that you will find the majority of the fleet in the low category and a few that have been unlucky and hit the mid category. But you will find a few in the top category, and you will find that they are the same boats year after year. They are either really unlucky or don't give a damn. They are the ones who deserve 100% observer coverage. If you have someone that is not fishing responsibly, they should pay the price. If the PDT does this correctly, there is no confidentiality issue here. The Agency can notify these boats through a permit holder letter and say like they did with the recent mackerel permit – you are in tier 1/2/3. They don't have to tell anyone else anything. If you want to create what you are asking for and foster the support of the herring industry and avoid prohibitive and unrealistic demands, you need the incentive. You need to reward the fishermen who have been doing this their entire lives. Give them credit for what they are doing. It's all right there in the observer data. I can't get anyone else's observed trips, and other boats can't get mine. But the PDT has access to this. If you want to know with a much bigger number of trips, both at-sea and shoreside monitoring, how the fishery performs, that's how you do it. Then, you are getting to where you want to be. The 100% observer coverage that everyone is pushing is not for A/B/C boats. It's for pair trawlers. Let's be honest. For whatever reason, that's not coming out in statements. If it was set by gear types, it may have been but it didn't come out that way. A/B/C catch the majority of the fish, but the pair trawlers are way up there with poundage. I'm not saying anything bad about them. I'm just saying if you want to know what they are doing, separate them out on an individual basis. It would take a little time and may not meet the timeline you are looking at now, but this is the way it needs to go. The boats get notified, and if they have this many more interactions of significance, they are alerted that if they don't do something different, they will end up with the 100% observer coverage. Those that fish responsibly get rewarded for it. This will be in the letter that I am creating that a lot of these smaller vessels support. It's not unrealistic.

Section 3.1.5, weighing the fish – 90% of herring are pumped out of the boats with vacuum pumps. It takes a certain amount of water to move those fish. The majority of them go into tanker trucks, which look like milk trucks, or vat trucks which is a truck with anywhere from 18 to 24 tubs on it. Those tubs traditionally hold 2,000 pounds, but you can't fill them to the top because create a problem for the trucks even with the lids on them. Simply weighing the truck empty and full, you are weighing water. You can't accurately do it, and it's something that is not necessary if you just apply this simple formula. When the fish get to the end user, whether it's a tanker truck or a vat truck, they are weighed – not all of them. They randomly weigh a number of tubs on each truck. The trucks I dealt with this winter carried 22, and we figured 1800 pounds per vat and the other 200 pounds was water. The plant would weigh whatever they want after they drained the water, calculate the poundage to dollars, and that was the weight of that truck. I guarantee you that it will be close to the weight of the fish, it should be accepted by the Agency just as that. The conversion from pounds to dollars should be adequate to determine the weight

of the fish. It doesn't matter what kind of truck it is. They drain the water out of the tanker trucks. Not every fish is weighed, but enough are weighed to get a realistic number to convert and pay the boat. They are not going to pay for more than what they are getting. If anything, they are going to pay for less, but it's not significant or we would question it. We have built a trust with our end users. I support using that formula to make the determination from pounds to dollars. The requirement to change the frequency of the VTRs and dealer reports is unnecessary at this time because the new regulations in the fall of 2011 requires every vessel to report electronically every day catch and discards by area. That is enough to report daily what is removed. The weekly VTRs and dealer reports are adequate in conjunction with that new requirement. If you come in in the middle of the afternoon or evening with two or three trucks of herring, you aren't going to be running to the post office every day to mail this VTR, it's not realistic, especially when you are doing electronic reporting.

Catch at sea – we have talked about that. The suggestion for the Herring PDT to do the analysis is the way to go.

River herring avoidance – this winter is unlike anything on record for temperature. I am in the study fleet and the SMAST bycatch avoidance program. I don't care what species you are dealing with. If you don't use a program in real time with daily reporting, and the areas are reported back to the fleet daily, it will fail. Every option and every single map in Amendment 5 would have missed the mark this year by 1000%. There was nothing but dogfish and butterfish in those closed areas last year. You would have redistributed the fleet and done more damage, and create a worse bycatch situation by moving the fleet out of that area. We had a few days where we would encounter some alewives and dogfish at very low levels, but we knew immediately when to move and how to move because the bycatch avoidance program with SMAST works so well and it's document. We are suggesting Alternative 2 Option 4, the Phased-in approach, which allows the program to be developed. This should apply across the board for any species. Any bycatch issue has to be addressed in real-time and has to be done with cooperation of the industry and outside academic partner. You have to have somebody besides the Agency collecting the information and re-distributing it back to the fleet so they can perform the way they need to. This works. It is demonstrated in the Nantucket closed area yellowtail

The study fleet – three small herring boats in the study fleet – that data is now being considered as good as observed trips, even though it is self-reported. Give us credit for that too. I am not enrolled in these programs to try to hide something. I am trying to prove a point that responsible fishermen can fish responsibly, in the herring fishery especially. I can get pushed out of the herring fishery. If it happens, it happens. But I will not be able to fish in any fishery anywhere on this coast as clean as I can in the herring fishery. I've done it all, and there is nothing cleaner than what we are doing now, if it's done correctly. Those that give us a bad name should pay the price.

I think the data is skewed if you go backwards from 2007. The threshold for a herring trip is 1,000 pounds. That should be raised to 10,000 pounds so that you separate the directed herring trips and small mesh inshore trips. Right now, it's all lumped together. If you change the threshold from 1,000 to 10,000, then you will identify the boats that were actually going out looking for herring, not mixed trips. That's why the data from 2007 back has very significant problems. It doesn't differentiate.

I have already talked to Amy van Atten about this. I think the observer protocols should change to ask the simple question of vessels in the herring fishery, do you have any fish aboard prior to sailing with an observer. We are hearing reports of boats coming in with fish that are not marketable. The fish are reported, but they are not being utilized. It adds to premature quota closures and removes opportunities for other boats in the fishery. There's nothing to prohibit that. But if the boat has 100,000 pounds on it going back to sea and catches 300,000, the boat ought to come in with 400,000. If he comes in with 300,000, I want to know where the other 100,000 went. The Observer Program could add a simple question and verify whether there are fish on board or not. It's not uncommon to go back out with fish. I've come in and not been able to line up trucks and then go back out the next day, and then come back in. At some time, they all get offloaded from the boats. It's not an uncommon practice. But we are hearing reports and we can't verify that it's happening. But if it is, it needs to end. That is not responsible fishing. The bycatch avoidance program – here are the charts sent out on a daily basis – it showed how effective it can be. It worked extremely well, it's the way you deal with the bycatch issue, and it's the only thing that will be successful.

As far as the river herring stock assessment goes, I told ASMFC, until the assessment separates bluebacks from alewife, you will have a failure of the stock assessment. It will not be successful because it's linked together. You need to identify each one individually. We need a retrospective analysis of mortality of river herring, fifty or forty years' worth. Find out what happened. Make a clear determination of where the failure is, if it's at all possible. You will find that bycatch by certain vessels or fisheries over time contributed to it at some point, but it is not the sole reason for this failure. The retrospective analysis would indicate to people where the problems are. I am worried about tomorrow. Use the best information available and make a determination that keeps the herring fleet alive and fishing in areas that it can prove to fish responsibly. That's what we are looking for.

John Redmond, recreational fisherman, Warwick RI: I am a recreational fisherman. I have watched what has happened with the local river herring, Buckeye Brook in particular. I also run a website with a lot of saltwater recreational anglers, from both boats and shore.

I am echoing Buckeye Brook, echoing Honest Bycatch, we are supporting 100% at-sea monitoring for all Category A/B midwater trawl fishing trips in order to provide reliable estimates of catch, including bycatch, and any impact on the depleted river herring and other marine life.

We want to discourage wasteful dumping of catch, Section 3.2.3.4 Alternative 4D, including a fleet-wide limit of five slippage events per management area. Operational discards, dumping valuable resources, and all that stuff must be included.

No herring midwater trawling in areas designed to promote rebuilding of groundfish populations, Section 3.3.4, Alternative 5. We cannot wait for the science. We have witnessed this coming to a significant crash, and entire year classes of fish are gone. We see that all the time down here at the local brooks. We can't wait to have all these studies and gradual implementation. There just isn't time, and we are seeing how this impacts us at the river herring level.

Christopher Hamblett, Save The Bay: Save the Bay has been around for 40 years protecting and restoring Narragansett Bay. We will submit written comments.

There has been a tremendous effort underway here to restore herring runs, both in Rhode Island and Massachusetts. Those efforts are beginning to bear fruit. It's true in Buckeye Brook, 10 Mile River, and other places. We are investing a lot of time and energy to do that. I think that management of the fishery needs to happen on all levels and all phases. We are doing our best with federal agencies to restore the historic fish spawning routes. All that will be for naught if the fishery at sea is not well-managed.

Things like 100% monitoring of Category A and B permitted vessels makes sense. How can we know what we are doing unless we thoroughly monitor? How can we really protect the fishery unless we set caps and accurately weigh and report on what's being caught? I don't have an response to the question about water and weighing, but I am sure that can be addressed. We will submit comments in the future, but we feel that there needs to be a holistic approach to protecting this resource. Monitoring and managing what is being caught at sea is an essential component of that.

Mike Flaherty, recreational fisherman, Wareham MA: I heard a gentleman earlier say he wanted to add something to the document. I don't think we should add anything. Anything that would delay this amendment is unacceptable to me. You may be aware of the recently settled case, Flaherty versus Bryson, where I was the plaintiff. The judge said that the Council has shirked its responsibility for certain bycatch, especially river herring measures, in Amendment 4, we don't want to do it in Amendment 5 as well. The second part is my opinion.

I support Section 3.2.1.2, Alternative 2 – 100% at-sea monitoring on all midwater trawl vessel trips Category A and B vessels, to provide reliable estimates of all catch, including bycatch, of depleted river herring and other marine life.

Section 3.2.3.4, Alternative 4D – an accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events per herring management area, after which a slippage event would require a return to port.

Section 3.4.4, Alternative 5 – I strongly support this. No herring midwater trawling in areas established to promote rebuilding of groundfish populations. I just heard the gentleman before tell me about how clean this fishery was. They were allowed into the haddock closed areas because we were told it was clean. We now know it's not because of all the haddock they have been catching – many metric tons. It's not acceptable. As a recreational fisherman interested in seeing haddock stay healthy, that is very important to me. I can't imagine if I was a commercial fisherman not allowed to fish in those areas with the largest mesh in the world, to allow the smallest mesh to get in there when I couldn't.

Section 3.3.5, if modified to require immediate implementation of a river herring catch cap, an immediate catch limit or cap on the total amount of river herring caught in the Atlantic herring fishery.

Section 3.1.5, Option 2 – a requirement to accurately weigh all catch is essential to any monitoring system. It is not clear to me in this document the use of operational discards. Is it true they are not being included in this. (Ms. Steele responded that operational discards are not included in the definition of net slippage.) I would like to see everything seen one way or another, even if that means bringing it on the deck and then pumping it back over so they don't have to hold it. I want to see everything.

Mike Laptew, RI: I am a Rhode Island resident, concerned citizen, filmmaker, and someone who has been on this issue for a lot of years. As a kid following the herring in the Buckeye Brooks, and then watching them every spring as a ritual, and then watching the depletion, looking for a smoking gun. Certainly, there were a lot of things brought to the table, but certainly this fishery, as a documentarian, I went out and spoke with people who worked on deck of pair trawlers and told me firsthand of what they witnessed in terms of bycatch with observer coverage on board. I showed the footage to my wife, and it literally brought her to tears.

I am 100% for 100% at-sea monitoring – 100% all Category A and B midwater trawl fishing trips to provide the reliable data that we need as far as bycatch and the depletion of river herring. The runs up and down the coast aren't what they used to be. I am never going to believe the smoking gun is too many seals and too many striped bass. We have always had a lot of seals and a lot of striped bass, but we have always had a lot of river herring, I'm talking about blueback herring.

The idea that dumping occurs is something that needs to be addressed. Section 3.2.3.4, Alternative 4D including the fleet-wide limit of five slippage events per management area, operational discards. The dumping of valuable resources in this day and age is not tolerable.

No herring midwater trawling in areas established to promote rebuilding groundfish populations, Section 3.4.4, Alternative 5. With the knowledge I have gained interviewing people that were players in this arena, I can see, as William Warner wrote, chronicling the offshore fleet that was pummeling our area prior to the Magnuson Act, it just seems like we have now done it to ourselves. We are not inviting offshore fleets to overfish, but we are actually encouraging overfishing by the sheer horsepower and over productivity and nature of pair trawling. This past winter, I watched pair trawling take place in areas where it could not be considered midwater trawling. I documented it in Narragansett Bay in areas where they just knew there had to be a bycatch situation.

We cannot wait for science to protect river herring. We support an immediate catch cap based on recent catch to limit what is currently being killed as bycatch. We support Section 3.3.5, only if modified to require immediate implementation of a catch cap.

Again, I would love to see the return of what used to make Buckeye Brook a teeming ritual every spring. I think that the need for 100% monitoring will give us the evidence we need to see that this fishery needs to be curtailed.

Russell Cleary, Commercial Anglers Association: We are an organization of hook and line and harpoon fishermen. We support better monitoring of the midwater trawler and pair trawler fishery under Amendment 5, such as observer coverage, dumping accountability, catch weighing, access to groundfish closed areas, river herring bycatch monitoring. The dramatic decline of the Gulf of Maine bluefin tuna fishery coincided with the development of the midwater trawler herring fishery. If a causal relationship cannot be proved, there is enough evidence that warrants observer coverage as is called for by these proposals in Amendment 5.

(Mr. Ruhle emphasized that many of the comments at this hearing supported observer coverage for Category A and B midwater trawl vessels, not all gear types with these permits.)

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-50

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 28, 2012 LOCATION: Hilton Garden Inn, Warwick, RI

CERTIFIED BY: Lori Steele

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Grout ✓		
Paul Howard AbS		
Chris Kellogg AbS		
Lori Steele ✓		
~~Talia Bigelow~~		
John Lake RIDEM	3 FT Wetherill Dr. Jamestown, RI 02813	401 423 1942
EOIN ROCHFORD	NEAFC 4 Bayard Dr. Salem NH	603 458-2731
RUSSELL E. CLEARY	30 Butler AVE. Maynard MA	978 897-2731
Paul Earnshaw	P.O. Box 9025 WARWICK, RI 02889	401-739-6592
Jim Ruhle	P.O. Box 302 Wanchese NC	
CAPT. DOM PETRARCA	63 ORMEROD AVE PORTSMOUTH RI	02871
Peter Eschenich	133 Terrace Ave, Riverside, RI	
Nick Ivy	62 BALL St WARWICK RI	02886 401 323-2077
JUSTIN FISETTE	34 WHITMAN ST COVENTRY RI	401-481-8081
Ed CERALA	579 MAIN St.	HOPKINTON RI 401-206-6686
Dan Sirigano	101 Hunt St	Seekonk MA 781-706-9406
DOMINIC SILVIO	1503 SHANNOCK RD CHARLESTOWN RI	255-6595
CHARLES JOHNSON	40 MELBOURNE ROAD WARWICK RI	02886
Mike DeLuca	186 MAIN ST E. Greenwich RI	02818
Jordan Sanford	167 pierce St E. Greenwich RI	02818 401-527-3728

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-50

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, March 28, 2012 LOCATION: Hilton Garden Inn, Warwick, RI

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
Taylor Sanford	22 Carroll Ave Newport RI	401-786-8960
Jeff Barker	623 Lyman Ave Warwick RI	401-258-8524
Chris Keen	76 Peckham Ave Middletown RI	484-888-6762
CHRISTOPHER HAMBLETT	c/o SAVE THE BAY 100 ITB DRIVE PROVIDENCE, RI	401-272-3540 x119
Najih Lazar	30 Overhill Rd Wakefield RI 02879	401-782-2171
Marcia Peña	92 Ogden Ave Warwick RI 02889	401-921-3267
GREG WELLS	59 TEMPLE PL. #1114 BOSTON, MA	617 728 0300
Mike Lapteu	50 Surrey Lane North Kingstown RI	401-884-0188
[illegible]	110 Spencer Gordon Ave Woonsocket RI 02895	401-219-6572
MICHAEL FLAHERTY	5 HARKINS WAY WAREHAM, MA 02571	617-729-3232
Lisa Aurecchia WRNC	27 Sims Ave Prov RI 02909	401-861-9046
Pamela Baglivo	61 Maple Hyannis	281-771-8579

March 28, 2012

Over the past decade there have been declines in river herring. The decline has been alarmingly noticeable, therefore in 2004 the a closure of the river herring fishery within Rhode Island inland waters was implemented. At the time there was no clear understanding for these declines in returning alewife and blueback herring. Many thought it was predatory increase or overfishing by anglers, and lobster fisherman.

Since the closures were implemented there has been monitoring many of these river systems, collecting data on the number of fish returning each year to spawn. Many of these rivers and streams are also being monitored for water quality information as well. There have been many notable and costly restoration projects, such as dam removals, habitat restoration, fish ladder installations, and repairs to existing ladders. Some organizations even put together groups of volunteers that work diligently to lift hundreds of thousands of herring over dams where no passage exist. Over the better part of the past decade, not one of our rivers are showing any sign that the herring are returning to their original stock status despite all the efforts made thus far.

Alewife and blueback herring are one of the most important part of the ecosystem of the ocean. They help to provide a balanced diet for so many species, like striped bass. Now there are concerns of diseased striped bass being detected with micro bacteriosis. It is being considered due to malnourishment. Osprey, Bald Eagles, once endangered have now got to compete for the few returning herring to sustain themselves and their hatchlings.

In our inland waters the annual herring runs once teaming hundreds of thousands of fish would bring people to observe this amazing site, or to take as many as 12 fish on a limited number of days as bait. Fisherman would bring along their young children so they could also experience such an amazing event of nature. Many areas once realised economic growth due to the herring runs because of visitors from all over who came to witness the event, or from anglers purchasing supplies, bait and tackle. However those boom days are gone now which is especially sad considering the overall economic downturn.

The commitment from land will continue, however there is only so much that can be accomplished from land. River herring only spend a very short portion of their life within our inland waters. This is why we need to address the bigger picture in our ocean waters especially within three miles of coastlines. I encourage this council to implement catch caps
on river herring, where currently there are none. Secondly, increase Federal on board observers to finally provide accountability, and ending the practice of at sea dumping where no observers are available.

Paul Earnshaw
Paul Earnshaw
President
Buckeye Brook Coalition
P.O. Box 9025

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Congress Hall Hotel
Cape May, New Jersey
March 29, 2012, 7 p.m.

Hearing Officer: Doug Grout
Other Council Members in Attendance: Erling Berg (MAFMC)
Council Staff: Lori Steele; Jason Didden (MAFMC)
Attendance: see attached (approximately 15 people)

Mr. Grout introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the NEFMC Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Jeff Reichle, Lund's Fisheries: Thank you for holding a meeting in Cape May. I will leave most of our comments to Jeff Kaelin, but I want to touch on a couple of things. Number one, I think it's a good thing that we are getting to a point where we are asking all industry to weigh everything that comes across the dock, in one way or another. I think that's a long time coming, and we support that 100%.

I want to talk a little about observer coverage – I think industry is tired of listening and being forced by a lot of half-truths floating around. Most of us have agreed that we would like to have 100% observer coverage because we have a very clean fishery and want to prove that. However, we don't want that coverage forever, and we are limited to what we can pay for it. But a good portion of the industry has decided that it's about time for people to put up or shut up, and we are ready to put up, to prove how good our fishery is.

I know I am not supposed to do this, but I am going to ask that you send the message back to the Council what happened this year with the closure of the herring fishery in Area 2 has grossly affected the mackerel fishery here in the Mid-Atlantic. Even though mackerel fishing has been very poor the last four or five years, we did have some mackerel show up in January this year. We fished on them for about three week, but because of the way the herring quota is being managed, we are shut down and stopped from catching mackerel because of the herring quota. This is a huge economic impact on Mid-Atlantic boats, and some of these bigger boats have little if any alternative. I hope that we can get Amendment 6 done by about six months from now.

Jeff Kaelin, Lund's Fisheries: I do government relations and fisheries management work for Lund's Fisheries. I am a resident of Cape May, New Jersey now.

Mr. Kaelin read a written statement into the record (see attached).

Fred Akers, Great Egg Harbor River: I am the River Administrator for Great Egg Harbor River, which is a little bit north of here. We are concerned about what's happening with river herring. I have submitted comments on Amendment 5, which I am not reading into the record. Thanks for the color coding in the document, it was very useful.

We are concerned about the future of river herring. On the Great Egg Harbor, which is a federally-designated wild and scenic river, we have done some data work in 1998 and 1999, and the river herring were found to be breeding in a number of locations. We also worked with Fish and Wildlife Service and others to build a $500,000 fish ladder, and that was about 2006. At the same time, there was another $600,000 fish ladder huge fish ladder built. There is a multi-million dollar on Union Lake. And there are three or four or five other fish ladders scattered in the south jersey area. There have been and continue to be significant investments and work on maintaining habitat on the freshwater side. New Jersey closed the river herring fishery this year but had to maintain 5% bycatch for river herring caught in Federal waters and landed in New Jersey. We want to see that part of the river herring story better protected through this amendment. That's why I am here.

John Connelly, Lund's Fisheries: I operate a boat for Lund's fisheries. We fish for herring and mackerel. I haven't fished in a month now because of the herring closure in Area 2. Probably two more months, I will be out of work. I take observers on the boat. Last fall, we had four trips with no observers. All the other trips, we had observers. Every one of them tells me that it's a clean fishery. I would like to see the people who say it's not put the money where their mouth is. If it's that bad a fishery, we have no problem taking observers. I had over 80% last year.

Lars Axelsson, Cape May: This is a family operation. We have two vessels, the Flicka and Dursten, out of Cape May. We have been fishing pelagic pretty much my whole career, since I graduated high school in 1973. It is frustrating on my part because I have fished with no regulations and now that we do have regulations. What is frustrating to me is that based on suppositions, this huge machine, this huge amendment is coming to bear, a lot like our health care plan, many pages long. We as fishermen have a hard time deciphering all of that. I take my off to people like Jeff who is willing to hire a full-time guy to try to decipher all of this and then try to condense it down so that we fishermen can understand what needs to be decided on. And then the frustration sets in again because it's based on pre-disposed ideas from other non-user groups of the resource.

Every time I have taken observers aboard my boat to see what kind of fishing I do and how I do, I am sure that if the people have the records of my observed trips, they can see how the fishery was in the mid-80s vs. the 90s vs. the 2000s, and how, with the net designs and the way we fish, we have improved our cleanliness. Whether we have 10% observer coverage, 20% coverage, or 100% coverage, you will roughly see the same bycatch that can occur.

Regarding river herring, I fished during the joint ventures with the east Germans, the Dutch, and the Poles. They were not allowed inside the 20 mile line because of river herring. I think there were some military secrets too, and the river herring was an excuse. But while we have been catching mackerel and encountering herring, and while we catch herring, and we have encountered a few river herring from time to time, nine times out of ten, the market will not accept the river herring to be mixed in with the other species. Most of the time it would go to

zoo food. It was claimed that the seals and penguins couldn't swallow these fish because it would hurt them. So we as a fleet have steered clear more and more through communication and the way we handle our gear and the way we fish it.

I listened to how you are trying to decide whether groups A and B should be covered more than C and D groups. And how bottom trawlers maybe don't have to carry observers, but the terrible midwater trawl boats in the A class do. From my own fishing experience, I have an understanding of what river herring look like compared to herring on the machine. Most often, the river herring tend to be closer to the ocean floor as compared to the rest of the fish. So if you are fishing harder on the bottom in an area where there is river herring, you will get more river herring mixed in with the herring. We have learned to fish our nets higher off the bottom in areas like that and have minimized the take quite a bit. But when you are talking about ¼ of 1 percent, ½ percent, in my mind's eye, just like the judge determined in regards to how much haddock and other bycatch are being taken in the closed areas Downeast, in our area here, it's a lot of to do and a lot of resources that are being expended on river herring. From my point of view, I think it's a waste of funds. I would much prefer to see the money and human resources to be exercised maybe towards scientific studies. Take the observer data from the boats and apply that to a status of the stock. Then, we can derive decent science that could either prove or disprove the amount of product that is in the ocean.

I can't understand for the life of me, back in the 70s, quotas were over 100,000 tons, 200,000 tons for years. In the mid-80s, the areas were given as much as 100,000 tons per area. When it got reduced again to Areas 1, 2, 3, there was an 80,000 ton reserve, and it has just been perpetually going down, for whatever reason I can't understand. Yet the fish have come, the fish have gone, before regulations, and even now with regulations. So maybe a redirection of the information you are going to garner rather than policing these terrible boats that are out taking unwanted species. Use that information to apply to the status of the stock model so that we can get good numbers to yield better quotas and become an even more sustainable fishery.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-51

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Thursday, March 29, 2012 LOCATION: Congress Hall, Cape May, NJ

CERTIFIED BY: Lori Steele

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Grout ✓		
Paul Howard Abs		
Chris Kellogg Abs		
Lori Steele ✓		
~~Talia Bigelow~~		
JEFF KAELIN	LUND'S FISHERIES, INC.	
INGO FLEMING		609 884 2113
Jeff Reichle	Lund's Fisheries Inc	609 884 7600
Peter Hamilton	NJDFW / MAFMC Proxy	6097488220
John Conneely	LUNDS FISHERIES	978 3049104
JACK SMITH	LUNDS FISHERIES	609-889-1722
ERLING BERG	MAFMC	609-884-4784
FRED AKERS	GREAT EGG HARBOR WATERSHED ASSOC	856-697-6114
Bill Bright	FV Retriever	609 338 3497
LARS AXELSSON	FV "FLICKA" AND FV "DYNASTEN"	609 224-8447

Draft Comments, Lund's Fisheries, Inc.
A5 to Atlantic Herring FMP – Thursday 3/29/12 Cape May hearing, Congress Hall 7pm

Sec. 3.1 PROPOSED ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM

Sec. 3.1.1 Regulatory Definitions (Transfer at Sea and Offload)

We support the establishment of regulatory definitions for *transfer at sea* and *offload* as an intent to clarify the regulatory definition of existing fishing operations, including clarifying that pair trawling does not represent a transfer at sea, increase the potential for accurate reporting in the fishery and minimize the potential for catch to be double-counted.

Sec. 3.1.2 Administrative/General Provisions

We support the proposed regulatory change that would clarify that vessels working cooperatively in the herring fishery are subject to the most restrictive possession limit associated with any of the vessels. The amendment refers to "paired purse seine operations", which is a description that we are not familiar with in the Atlantic herring fishery; traditionally, any purse seine skiff being used to set a purse seine has been considered part of the purse seiner itself and not a "paired vessel."

We support the amendment's intent to make VMS power-down provisions consistent with the multispecies, scallop and surf clam/ocean quahog fleet and allow VMS units to be powered down after the issuance of a Letter of Exemption (LOE), if the vessel is expected to be out of the water or not fishing for an extended period of time.

We support the establishment of a new Federal At-Sea Herring Dealer permit for carrier vessels or other vessels selling Atlantic herring to any entity since the intent is to improve reporting in the fishery. We encourage the agency to ensure that double-counting of landings is minimized through this change.

Sec. 3.1.3 Measures to Address Carrier Vessels and Transfers of Atlantic Herring At-Sea

We support 3.1.3.2 Option 3, which would provide flexibility for herring carriers to either utilize a VMS for declaration, thereby eliminating the minimum seven-day enrollment period and allow for engagement in other activities, or maintain the status quo (minimum seven day enrollment period with LOA restrictions), which would accommodate smaller carrier vessels that do not utilize VMS.

We support 3.1.3.3 Option 1, which would make no changes to current provisions regarding the transfer of fish at sea. It is our understanding that current reporting requirements are adequate to determine and segregate catches and allow for the transfer of herring at sea to vessels without a herring permit, for personal use as bait.

Sec. 3.1.4 Trip Notification Requirements

We support a combination of 3.1.4.2 Option 2 and 3.1.4.3 Option 3, which would expand and standardize current trip notification requirements throughout the herring fishery, as we understand the proposal. We are unclear why Option 2 would not reach Category D vessels fishing in Area 2 and why Option 2 is limited only to fishing for herring with midwater trawl gear. Option 3 seems to include all fishing activity in Area 2, and in other herring management areas, and require both observer and enforcement notifications regardless of gear type used. It is our understanding that the small mesh bottom trawl fleet can also take river herring as an incidental catch, not only in the Gulf of Maine but also in Area 2 during the winter months, so it makes sense that all vessels working in the directed herring fishery, whether it be with an A, B, C or D permit be required to both call for observers before fishing and notify NMFS law enforcement before landing, so that monitoring activities, both at sea and shoreside, can provide the most complete picture of what is being caught and landed in the fishery.

Based upon herring fishery landings and other data that has been reviewed during the development of Amendment 5, our understanding is that the number of Category D vessels that would be regulated under this change, and others proposed in this amendment, would be only about 10% of the Category D permits issued. *(For example, Page 6 of the PHD tells us that 2,258 Category D herring permits were issued in 2010 while Page 19 of the PHD tells us that only 244 Category D herring permit holders are expected to qualify for mackerel limited access permits; we can assume that only this limited number of Category D permits were also fishing for herring when they encountered mackerel, likely while fishing in Area 2. While this calculation does not take into account the number of Category D permit holders landing herring in the Gulf of Maine, we expect that the total number of Category D vessels actually fishing for herring are far fewer than the 2200 total number of permits issued. There seems to be a need to rationalize the number of Category D permits that are being issued. We would support a requirement that all Category D permit holders have VMS on board when fishing directly for herring and would anticipate that the number of herring Category D permits applied for would likely drop dramatically if this requirement were imposed.)*

Sec. 3.1.5 Reporting Requirements for Federally Permitted Herring Dealers

We support 3.1.5.2 Option 2, which would require dealers to accurately weigh all fish, and *Sub-Option 2B*, requiring dealers who do not sort by species to document, for individual landing submissions, how they estimated the relative composition of a mixed catch, to facilitate both quota monitoring, incidental catch analysis and cross-checking with other data sources.

We are opposed to 3.1.5.2, *Sub-Option 2C*, which would require dealers to obtain vessel confirmation of SAFIS transaction records to minimize data entry errors at the first point of sale. This proposal seems to be focused on minimizing discrepancies between vessel hails (an estimate of what is on board) and actual amounts of herring that is purchased by dealers. It places fishermen and dealers in a potentially adversarial, competitive regulatory posture that should be reserved for the Agency, as we understand what is being proposed.
If catch is weighed and sorted after landing, dealer reports should become the primary data source for quota monitoring by the Agency, as we understand to already be the case today.

Weighing and sorting will make dealer reports more accurate than they are today and eliminate the need for fishermen and dealers to compare their reports, and potentially be penalized if estimates and actual weights vary, which they will certainly continue to do.

Sec. 3.1.6 Changes to Open Access Permit Provisions for Limited Access Mackerel Vessels in Area 2/3

We support 3.1.6.2 Option 2, which would establish a new open access herring permit for limited access mackerel fishery participants, in Areas 2/3 only, who do not have a limited access herring permit. This permit would be associated with a 20,000 pound possession limit for herring and would assist these vessels by providing a reasonable incidental catch allowance of herring to allow them to be able to fish for mackerel and may reduce discards of herring. This amount equates roughly to the 25,000 pound mackerel incidental catch allowance, made by the MAFMC, for vessels fishing for herring, in all herring management areas, which was established in Amendment 11, the mackerel limited access amendment.

We also urge the Council to begin now to plan for allocating a significant set-aside of Atlantic herring, and explore other options during the upcoming specifications process, to facilitate an Atlantic mackerel fishery in the future that is not severely limited by lack of availability of Atlantic herring, as is the case this year. This year, the expiration of the Area 2 herring quota will keep more than 50 million pounds of mackerel from being harvested, at the same time that herring continue to be widely available in Area 2, according to accounts by vessel captains. Vessels are tied up today due to this fact and millions of dollars of wasted mackerel quota will not be taken due to the failure of the Agency and the NEFMC to set-aside herring quota for this purpose, as we requested when the current specifications were established. We estimate that a 10,000 metric ton set-aside may be adequate for this purpose, given the size of the current mackerel quota, and since the herring-to-mackerel mixing ratio can often be as much as 30%. It is our hope that the ongoing assessment will provide an opportunity to return the Area 2 quota to a level exceeding 30,000 metric tons, as has been the case in the past, to facilitate a mackerel fishery in the future.

Sec. 3.2 CATCH MONITORING: AT-SEA

3.2.1 Alternatives to Allocate Observer Coverage on Limited Access Herring Vessels

Throughout the development of Amendment 5, we have argued that the herring fishery should not be singled out as being required to pay for excessive levels of observer coverage, beyond what the Agency and Council may prioritize through the SBRM process; a treatment similar to other fisheries managed by the Council.

We have taken this position because we believe that the herring fishery is one of the 'cleanest' fisheries in the region, and that this fact continues to be borne out by the data coming out of both the at-sea observer program and the shoreside monitoring program, a program that we believe should be continued in the region.

We have heard herring PDT members say that there is a limit as to the precision and accuracy of catch data accumulated through the observer program, even if the coverage level were to be at 100%, and have heard members of the scallop PDT state that observer coverage levels of about 30% in that fishery are adequate and that 100% observer coverage is unnecessary to satisfactorily monitor the scallop fishery, another regional fishery that we are active in.

Even so, we and the majority of other Category A-permitted herring vessels owners, are willing to support observer coverage levels of 100 per cent in the herring fishery, for a limited period of time, because we remain convinced that the data will continue to show that incidental catches in this fishery are not of significant biological concern to haddock, shad, river herring or any other regional fishery stocks. We are taking this position as a challenge to our detractors, who so far have shown no interest in the actual data coming from current monitoring programs and who continue to make unsubstantiated claims about how the herring fishery operates. We will take observers at a 100% rate to continue to demonstrate that the herring fishery is a responsible fishery.

We take this position with a couple of caveats, however. First, we do not support maintaining 100% observer coverage levels in the herring fishery forever since we do not believe this coverage rate is necessary and because the expense can be significant. We suggest that a 100% requirement be temporary and only last two years, after which time the PDT should be tasked to analyze the data and report to the Council as to whether or not this level of coverage is necessary to adequately monitor the herring fishery in the future.

Second, we are only willing to purchase observer coverage, beyond those levels that may be allocated through the SBRM process, and up to 100%, if the daily cost can equate to the $325 a day rate paid by the West Coast H&G fleet, a fleet whose observer coverage rates have been suggested as a model for the herring fishery during the development of Amendment 5 by those who argue that we are under regulated and operating unsustainably. We are opposed to paying the $1200 a day rate calculated by the observer program since this represents a cost that would not be sustainable in the low value Atlantic herring fishery.

Third, we only support a temporary, 100% observer program in the herring fishery if the program would authorize the Agency to provide a vessel with a waiver if a Federal observer, or an observer from an approved observer service provider, is not available for a particular trip. We simply cannot afford to have our vessels tied up if an observer is not available to us for some reason and we are willing to both take and pay for an observer on that trip.

Sec. 3.2.2 Management Measures to Improve/Maximize Sampling At-Sea

We support the addition of the provisions listed in Sec. 3.2.2.2, which are intended to improve sampling by observers at-sea and we understand that many of these provisions are already in place; these include requirements for a safe sampling station, requirements for 'Reasonable Assistance', requirements to provide notice, requirements for trips with multiple vessels, improving communication on pair trawl vessels and providing visual access to the net and codend. It is our understanding that the relationship between the Federal observers that have been on our vessels over the past few years and our fishing captains is excellent and we have

attempted to cooperate with every request made to us by the observer program throughout this period of time.

Sec. 3.2.3 Measures to Address Net Slippage

We support Sec. 3.2.3.2 Option 2 requiring the use of a released catch affidavit for 'slippage events' and understand that these affidavits are already in use, with the support of vessel owners and captains.

We are opposed, however, to the continued application of the Closed Area 1 Sampling Provisions (Sec. 3.2.3.3), either within Closed Area 1 or elsewhere because of the requirement that all fish be brought on board for sampling and inspection by the observer. As we have repeatedly pointed out during the development of Amendment 5 there are significant operational restrictions that make it impossible, or dangerous, to bring the pump and codend over the rail during fishing activities on midwater trawl fishing vessels. Our captains tell us that the observers have no problem seeing what remains in the net after pumping, while the net remains alongside the vessel and, as we indicate above, we have no problem providing visual access to the net and codend so that the observer can do his or her job.

We are strongly opposed, however, to all of the options listed in Sec. 3.2.3.4 Options 4A through 4D (proposing catch reduction and trip termination) as being simply punitive in nature and not being constructive to the ongoing cooperation between our captains and the observers on our vessels.

In addition, we urge the Council and the Agency to repeal the Closed Area I regulations since there is no indication that incidental catches in Closed Area I differ significantly from those in other areas where the herring fishery operates and due to the fact that there is no data to indicate that the herring fishery is having any significant mortality effect on any groundfish species, either inside or outside of Closed Area I.

It is important, however, to retain in regulation that fish can be released throughout the herring fishery if the vessel operator finds that:

1. Pumping the catch could compromise the safety of the vessel;
2. Mechanical failure precludes bringing some or all of the catch aboard the vessel; or
3. Spiny dogfish have clogged the pump and consequently prevent pumping of the rest of the catch.

Finally, as we all know, the Council's habitat and groundfish committees are moving towards either eliminating Closed Area I or modifying the area due to its lack of relevance today as either a groundfish protection or habitat protection area, making regulations specific to the area equally irrelevant to managing the herring fishery today or in the future.

Sec. 3.2.4 Maximized Retention Alternative (Experimental Fishery)

We support Sec. 3.2.4.1, the no action alternative. Herring vessels would continue to operate under the regulations and possession limits for any fisheries for which they possess permits.

Amendment 5 would add other regulatory changes, which we could support, consistent with our comments.

The herring fishery has taken place in this region for more than 100 years and was the first fishery to agree to hard quotas, more than a decade ago with the approval of the Federal FMP, by the Council and Agency, in 2001. The idea that the herring fishery should be operated as an experimental fishery has been suggested by advocates who clearly would like to eliminate the majority of the fishery and the vessels in it. This proposal only has punitive value and should be summarily rejected by the Council.

Sec. 3.3 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

Sec. 3.3.2 River Herring Monitoring/Avoidance

The public hearing document tells us that the long-term goal of this section of the proposed amendment is to adopt river herring bycatch avoidance strategies in the time and areas where interactions with the herring fishery are observed or anticipated.

At the same time, the Magnuson-Stevens Fishery Conservation and Management Act's National Standard Nine requires that "*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.*" National Standard One requires that "*conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the United States fishing industry.*" The Atlantic herring fishery is not considered overfished, nor is overfishing occurring, so maintaining OY in the fishery must be a Council priority.

We agree with the amendment's goal, since it has now become clear to us that minimizing the incidental catch of alosine species has recently become both a public and a Council interest and we recognize our duty under the law to reduce the incidental catch of these fish.

As this amendment has developed over the last few years, however, we have come to the realization that most of the river herring monitoring and avoidance strategies proposed by the Council in the amendment do not recognize the temporal and spatial variations dictating where river herring will be from year to year, or even from day to day, and that the extensive areas that are proposed to be closed threaten our ability to continue to catch herring, either to provide an important baitfish for the region's lobster and crab fisheries or to export high quality, nutritional herring for human consumption when international markets are available to us under favorable terms.

Consequently, during the past two years, we have been working with other boat owners, organized as the Sustainable Fisheries Coalition (SFC), and in partnership with the Massachusetts Division of Marine Fisheries (DMF) and the UMASS Dartmouth School of Marine Science and Technology (SMAST), to replicate a bycatch avoidance project already in use in the scallop fishery, to reduce the incidental catch of yellowtail flounder; an approach recognized as effective by this Council.

Our project, funded for the past two years through the National Fish and Wildlife Foundation, and with recent financial support from the Nature Conservancy to allow for the participation in the project by small mesh bottom trawl fishermen, is already working to create awareness of the issue within the fleet and direct effort away from where river herring species are known to be on a daily, real time basis. At this time, we are seeking additional funding through the MAFMC RSA program, so that this low cost, real time program can continue into the next fishing year. This program includes a goal of monitoring 50% of trips that are landed, so that incidental catches can be identified and quantified.

Within this context, we support Sec. 3.3.2.2.4 Option 4, a two-phase bycatch avoidance approach based on SFC/SMAST/DMF project, as the only option that will work to reduce the incidental catch of river herring in the herring fishery and allow for the continued production of optimum yield from the Atlantic herring resource. The project should involve all vessels directing on Atlantic herring, including Category A, B, C and D permit holders. VMS is essential to the success of this project and therefore, all Category D permitted vessels directing on Atlantic herring should be required to have VMS on board.

Sec. 3.3.5 River Herring Catch Caps

We support the Council considering a biologically-based river herring catch cap through a framework adjustment to the herring FMP or the herring specifications process after the ASMFC completes its stock assessment. We recognize that the employment of a reasonable cap would complement the efficacy of the SFC/SMAST/DMF project. A shoreside monitoring component would be necessary, however, to allow the fleet and the agency to know how much of the cap had been taken at any particular time during the fishing season.

Recently, we participated in a meeting where a preliminary ASMFC assessment report was presented to the Commission's Shad and River Herring Technical Committee and understood one of the conclusions to be that current levels of river herring fishing mortality did not collapse river herring stocks up and down the coast and that, if the current level of incidental catch in the herring fishery were entirely limited, all riverine herring runs would not recover due to the myriad mortality threats that these species face. The relative mortality effects of incidental catches in the herring fishing would be critically important to understand before setting a biologically-based catch cap.

Sec. 3.4 MANAGEMENT MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

As stated above, we believe that there is no relationship between incidental catches in the Atlantic herring fishery and the groundfish closed areas. The GFCAI provisions (CFR §648.80) should be repealed upon implementation of this amendment for this reason and access to the groundfish closed areas should be retained for both herring midwater trawlers and purse seiners, through a LOA issued by the agency, as had been the case for many years.

In response to a previous legal challenge to midwater trawlers' rational access to GFCAI and other mortality closures, in a brief to a Federal court in June 2009, Agency attorneys wrote, "*even if bycatch in the herring fishery (was) hundreds of times the level suggested by the data, then there would be no compelling reason to suspect that haddock or other groundfish stocks (are) imperiled.*" The Agency also clarified in its brief that, "*by contrast, the directed groundfish fishery's total allowable catch of haddock is...500 times the (existing) herring bycatch cap*" and "*for those stocks that are undergoing overfishing, the bycatch in the herring fishery is so miniscule that the measures sought (evicting herring vessels) could not prevent overfishing of these stocks.*"

In conclusion we strongly support Sec. 3.4.1 *Alternative 2 – Pre-Closed Area I provisions*, which would reestablish criteria for midwater trawl vessel access to the groundfish closed areas based on provisions prior to the implementation of the Closed Area I rule.

###

The Great Egg Harbor Watershed Association & River Council

Fred Akers - Administrator
P.O. Box 109
Newtonville, NJ 08346
856-697-6114
Fred_akers@gehwa.org

March 29, 2012

Paul J. Howard, Executive Director
50 Water Street, Mill #2
Newburyport, MA 01950

RE: Draft Amendment 5

Dear Executive Director Howard:

The Great Egg Harbor River supports breeding River Herring, and we are very concerned about the future of our River Herring populations. The current study for their listing under the Endangered Species Act is a reason to move quickly to protect this fish species and other species in the ecosystem dependent on River Herring.

Amendment 5 was initiated almost five years ago, following a wave of public outcry to address concerns with industrial trawling, and the dangerous, poorly regulated practices allowing these huge ships to severely impact the marine food web. Herring trawlers are the largest vessels on the East Coast, and their football field-sized nets catch and kill millions of pounds of unintended catch every year, including depleted fish, like bluefin tuna, river herring, shad, and cod, as well as whales, dolphins, and seabirds.

Specific concerns with the fishery include inadequate monitoring, unmanaged catch of river herring, continued killing of groundfish within closures designed to protect them, and the wasteful practice of dumping catch at sea. Alarming interactions with groundfish also continue, as midwater trawl fishermen demanded and received a five-fold increase in their haddock bycatch allowance.

Since the initiation of Amendment 5, these problems have continued to get worse. The National Marine Fisheries Service (NMFS) has repeatedly proven unable to enforce Atlantic herring quotas, the first step in fishery management, due to inadequate catch monitoring. In addition, the practice of dumping catch at sea continues to undermine efforts to identify and record everything that is caught by herring vessels.

We strongly urge you to approve a comprehensive monitoring and management reform program that brings greater accountability and oversight to the industrial trawl fleet. At minimum, the following actions must be approved:

OFFICERS

Julie Akers
President
Ed Curry
Vice President
Dick Colby
Treasurer
Lynn Maun
Secretary &
Coordinator

TRUSTEES
Steve Eisenhauer
Elmer Ripley
Sarah Summerville
Jamie Cromartie
Pat Sprigman
Clark Sprigman
Clay Emerson

RIVER COUNCIL

Chair:
Gregory Gregory
Somers Point
Vice Chair:
Richard Coe
Monroe Twp.

COUNCILLORS
Julie Akers
Buena Vista Twp.
Richard Foster
Corbin City
Bill Christman
Hamilton Twp.
Ralph Bernard
Weymouth
Clark Sprigman
Winslow Twp.
Keith Kendrex
Hammonton
Jim Owen
Estell Manor
Joel Spiegel
Borough of Folsom
David Brown
Egg Harbor Twp.
William Handley
Upper Twp.

- 100 percent at-sea monitoring on all midwater trawl fishing trips (i.e., Category A& B vessels) in order to provide reliable estimates of all catch, including bycatch of depleted river herring and other marine life (Section 3.2.1.2 Alternative 2).

- An accountability system to discourage the wasteful dumping of catch, including a fleet-wide allowance of five slippage events for each herring management area, after which any slippage event would require a return to port (Section 3.2.3.4 Option 4D).

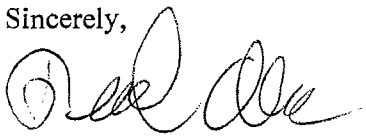
- No herring midwater trawling in areas established to promote rebuilding of groundfish populations (Section 3.4.4 Alternative 5).

- An immediate catch limit, or cap, on the total amount of river herring caught in the Atlantic herring fishery (Section 3.3.5, Modified to require immediate implementation of a river herring catch cap).

- A requirement to accurately weigh and report all catch (Section 3.1.5 Option 2).

Thank you for considering measures designed to revise the Atlantic Herring Fishery Management Plan to protect the River Herring and other bycatch species.

Sincerely,



Fred Akers

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Hearing Summary

Amendment 5 to the Atlantic Herring Fishery Management Plan

Hilton Hotel
Mystic, CT
April 25, 2012, 6 p.m.

Hearing Officer: Doug Grout
Council Staff: Lori Steele, Chris Kellogg, Rachel Neild
Attendance: see attached (approximately 20 people)

Mr. Grout introduced Council members and staff in attendance and provided some opening comments about the Amendment 5 process. Lori Steele briefed the audience on the Amendment 5 public hearing document. After an opportunity to ask questions for clarification, public comments were taken on the measures proposed in Amendment 5.

Public Comments

Peter Baker, Herring Alliance, Pew Environment Group: Thank you for the opportunity to offer this statement regarding Amendment 5 to the Herring FMP. Many of you know me. My name is Peter Baker. For the last four years of the development of this amendment, I have spoken to you numerous times and sent you countless letters. I direct the Northeast Fisheries Program for the Pew Environment Group. I am also a founder and director of the Herring Alliance. Since 2007, when the Council made this amendment a priority and the Herring Alliance was founded, we have grown from the 12 original member organizations to 47 local, state, regional, national, and international conservation and watershed organizations. Herring Alliance has members active in every state from Maine to North Carolina.

Development of Amendment 5 has been a long and arduous process with multiple delays and setbacks. Throughout the development, conservationists, recreational fishermen, commercial fishermen, ecotourism companies, river herring enthusiasts, coastal residents, and every day Americans have called for a meaningful reform of the management of the industrial trawl fleet. The Council has included several important measures in Amendment 5 that need to be implemented if the herring industrial trawl fleet is to be allowed to continue to operate in New England waters. As you know, development of this amendment has been contentious. Employees of the industrial trawl fleet have attempted to discredit and intimidate people calling for reasonable management measures. Recent industrial trawl blogs and public comment have accused people calling for reform being racist and xenophobes. They have compared the Pew Environment Group the Third Reich, and they compared people who work for Pew with Satan. Recently, an industrial trawl employee put up a blog claiming that people that want the industrial trawl fleet to be better managed want to kill babies in Africa.

(Mr. Grout asked Mr. Baker to address his comments to the amendment and to keep his remarks focused on the Amendment 5 document.)

The great myth that industrial trawl spokespeople have been stating is that the movement to regulate their fleet is a grand conspiracy created by Pew. They claim that the tens of thousands of people who sent in public comment on this amendment and the hundreds of commercial and recreational fishermen who have showed up for these public hearings this spring are somehow on a payroll.

(Mr. Grout once again asked Mr. Baker to focus his comments on the document, not on the other comments or others who have commented during the public comment process. He discouraged Mr. Baker from personal attacks in his comments.)

What measures in Amendment 5 are necessary if industrial trawling is to continue in New England waters? We at the Herring Alliance have spent much time and effort on this subject. We believe that there are five critical measures that must be implemented as part of Amendment 5. First, industrial trawlers, often fishing in pairs and able to catch hundreds of thousands of pounds of fish each day, must have observers on board to sample the catch. Whether these observers NEFOP observers or third-party observers, and whether or not this is paid for by the government or industry, an observer must be on board an industrial trawler any time it is fishing in New England.

Second, the observer must be allowed to sample all the catch. Limited exceptions must be made for vessel safety or legitimate mechanical failure, as outlined in the Closed Area I rules. Aside from the limited exceptions, all catch must come on board for sampling.

Third, once brought ashore, the catch must be weighed or otherwise verified by a third party. The captain's best guess estimate is not sufficient.

Fourth, industrial trawling should not be allowed in groundfish closed areas. Groundfish stocks and the groundfish industry are in crisis. Allowing industrial trawlers with a proven catch of groundfish into these nursery areas is foolish and unacceptable.

Fifth, a cap or limit on the catch of river herring by industrial trawlers must be instituted. River herring are in trouble. If current assessments are not considered robust enough to form the basis of a biological catch, then the cap should be based on a recent catch, just as herring and mackerel catch limits are currently based on recent catch.

To conclude, the industrial trawl fleet began fishing in earnest in New England just over a decade ago. On the strength of about a dozen test tows and the word of the industry that midwater trawl nets could not catch groundfish, these ships were allowed access to all New England waters, including groundfish closed areas. Pair trawling was allowed without ever being tested or well understood. In the fall of 2007, the Council made it a priority to reign in this industrial fleet and create management measures that will lead to accountability. In June, you have the opportunity to make changes that fishermen, conservationists, business owners, and the public have asked for over and over and over again. We at the Herring Alliance implore you to take meaningful action that includes 100% observer coverage, a river herring catch cap, and protection of groundfish nursery grounds.

Bill McWha, CT: I am from the state of CT, I am a private citizen. I wear this hat, etc. We have been doing this for five years. We are tired of coming to these meetings. Every day I come here, it costs me a day's pay, it's money out of my pocket, and it's the same stuff over and over again.

I am in favor or 100% on-board monitoring and/or 100% dockside monitoring. You have to find out what these boats are catching, you have to sample the loads. I am also in favor of 100% retention, even though that's probably not in the document.

For the last three years, I have lifted river herring over a dam in Wakefield Rhode Island. This year was a good year. Instead of one drop in the bucket, maybe this year we had two drops in the bucket. I'm out there working hard, trying to protect the river herring, and I want to know what the New England Fishery Management Council is going to do. We have been talking about this for four or five years. It's time you guys do something. Ever since these midwater trawl herring boats were allowed to fish in New England, the anadromous fish returns to the Connecticut River have plummeted, since 1992 or 93, they have steadily declined. Just recently, they have come back slightly. It happens to be a coincidence that ever since we had herring midwater trawl boats, these anadromous fish declines have taken place. It's got to stop. Either that, or need to limit their catch, with on board observer, or you go to a gear change and drop the size of the nets. You have to do something. You are fishing out the bottom of the food chain. You are cleaning the ocean out. There is going to be nothing left. I am tired of wearing this "etc." hat. I am going to urge you please 100% on board observers and 100% dockside monitoring.

One last thing, Vito Calomo was talking about jobs. Everybody needs a job. The ocean is not the government printing office. We just can't print money to create jobs. You can't print fish. There are only so many fish in the ocean. Either you stop now or you will stop later, but you are going to stop because you are going to run out of fish. The other thing is fish need to become more expensive or they are not going to survive.

BobVeach, CT Charter and Party Boat Association: On behalf of the members I represent, I ask the Council to consider the following:

100% observer coverage on Category A and B herring vessels in order to provide reliable estimates of catch, including bycatch of river herring, cod, haddock, bluefin tuna, and other marine life.

Closed Area I provisions with trip termination after ten dumping events in order to reduce dumping on Category A and B vessels. Given the nature of the gear being used in this fishery, it is critical that rules are put in place to make sure that unsampled dumping is not occurring.

Prohibit herring midwater trawl vessels from fishing in groundfish closed areas. These boats should have never been allowed in there to begin with.

Implement measures to require weighing of catch across the fishery so that managers have accurate data on how much herring is being landed in the fishery.

By taking these steps, the Council will be able to fix many of the most pressing problems in this fishery. Please do what is right and approve these measures.

Gary Libby, groundfisherman, Port Clyde ME: The number one issue for me in the whole amendment, since before the amendment, is midwater trawl access to the groundfish closed areas. I have a bunch of friends who are groundfish fishermen in the Port Clyde area. They feel like I do. We don't think that trawl access should be allowed in a closed area. We don't think that any access should be allowed in those closed areas. Right now, we are struggling to survive in the groundfish fishery. We have been told in the past that it's not that many fish. Some numbers I see on the papers, it's more fish than I catch in the year. I guess I don't catch many fish. That and monitoring.

I think we need to have the monitoring. I think it's needs to be for catch and bycatch. We need to know what's going on both ends of it. I think it should be A and B vessels because of the 97% figure. If we cover 97% of the fishery, we can extrapolate 3% and pretty much get a handle on the catch and bycatch. I spoke before and written comments. I don't want to take up much time. Those are my big points. The groundfish closed area one is the one that really affects the way we fish in Port Clyde. It's the trawl access in there. If you are going to have closed areas, they need to be protected.

Gary Hatch, Owl's Head ME, Category A Herring Fisherman: I am going to get away from the topics of the past and touch on some of the things in this document that I felt need some refinement. The reason I'm bringing these up is that I feel out of sort. I am a traditional fisherman in this category. I am not only a stop seiner, but a small purse seiner, and we traditionally use carrier vessels. With the things that are brought up in this document, I wish that we could have segregated in the category of what we are so that we could have gotten better feedback. In some instances, we are talking about 150-foot carrier boat, which isn't what the traditional carriers are from the state of Maine or even New England.

To be versatile as a small boat carrier, we need to use a VMS so we can declare in and out daily because in three years ago, we had some menhaden fishery. It looks like we may have some this year, so we aren't tied to being a herring carrier. We can transfer back and forth between our herring days and the opted out days.

The other part is that I would like to touch on is the dealer permit for the herring carrier vessel. With the VMS, that would at least quantify where we are and what we are doing, and the details of how we use that permit. If we declare where we sold it and how much we did, but the catcher would be the one to declare daily to NMFS through VMS on how many were caught. And at the end of the week, both figures would be brought together so that you would have your cross-check for how many fish were caught by that company or organization.

The other one would be the transfers at sea. Again, to say that we can't use carrier vessels, that is the most traditional fishery that this whole fishery has. I would feel that it is a violation of Magnuson to suggest that we can't continue the traditional fishery and the methods that it uses to operate.

David Gelfman, F/V Horse Mackerel: I believe the herring boats should be put out of business, but that's not going to happen. So, the first thing you should do is verify what they catch with a precise system of weighing their catch. You need to have 100% observer coverage on all their trips everywhere, not just in closed areas. If we can't pay for it with government money, they should pay for it with their own money. Their fishery is leading to the destruction of all the other

fisheries. There is no reason why they can't afford to pay a little more and be observed, and verify the claims they make about a clean fishery.

I have spent approximately 60 days over the past two years on the Canadian border on Georges Bank in the closed area. 57 of those days, I had herring boats nearby. There's codfish, juvenile haddock, whales, tuna fish, everything there. Nobody knows what they are catching. You need to make sure we monitor what they catch.

The closed areas should be closed to them. When I started fishing in the early 1980s, there weren't any closed areas. When the herring boats arrived, they were the only ones allowed in. As soon as they started fishing, the herring population started going down. We need to weigh the catch, verify what they catch, observe what they catch, make sure they bring their net on board to verify what's in the net. And make sure they are out of the closed areas.

Peter Mullen, Herring Fisherman, Gloucester, MA: To the comments that we need 100% observer coverage. We have no problem with 100% observer coverage if we can figure out how to pay for it. We can't afford $1,200 a day. Give us 100% observer coverage. We have no problem with it, so we can clean up some of these lies that are being told up and down the coast.

Eoin Rochford, NORPEL, New Bedford, MA: I am the plant manager at NORPEL in New Bedford. I have a problem with 100% observer coverage. What's going to happen is the government isn't going to pay for it, and it will put smaller boats out of business. The bigger boats are going to be able to pay for it in the short-term, but they will have to pass on costs to end users, particularly the lobstermen. At the plant, we can't afford to pay the higher prices for herring that the lobstermen can. Our markets are basically third world countries. We are market competitive. If the price of fish goes up, we literally can't afford to buy it because we can't make a profit. The bottom line is that we are in business to make a profit. So it's a very dangerous game to start playing. If the government is going to pay for it, then certainly. We would love 100% observer coverage. The State of Massachusetts had dockside observation almost 100% of the time at our plant last winter from when we started receiving product in September until February when Area 2 closed. The dockside observers were shocked, stunned, amazed with the lack of bycatch.

What 100% observer coverage says to me that first, you are saying the observers that are there aren't doing their job because if you look at the data, you will see that there is very little bycatch on the herring boats. Number two, you are saying Massachusetts Department of Fisheries didn't do their job this winter because their documented evidence shows the same story. It's saying DEM, who are basically law enforcement, when they come to check the plants, it's saying that they are not doing their job. It is saying that the U.S. Coast Guard is not doing their job. So before we see 100% observer coverage, I would like to see all of these departments indicted for not doing their job. I feel that you have the public outcry is saddle the industry with burdensome costs that will put most of them out of business, particularly the smaller Category A permit holders and Category B permit holders. Category C and D vessels are fishing usually with bottom gear and not midwater gear. Technically they can fish with midwater gear. But those boats, even though they are catching a small amount, have very high percentages of bycatch which all goes into the mix when you look at the observer data. From looking at this data, I was shocked by what I saw in it. I have midwater fished for years, but I have never seen the bycatch that I have seen documented from the observer program. I asked for the data to see it. The

bycatch across the herring fishery is 1.4% based on the poundage of herring to bycatch, and that is all the bycatch over the last 10 years. I was going through all of the different species and I said I have never seen any of these species at the plant. I would love to see a lobster and take it home for dinner, but the point is that I have never seen that coming off these midwater boats. The data is getting skewed by these smaller boats, particularly the C and D boats. They are seeing a lot more bycatch than the Category A and B permit holders. Now, there is a huge variation in Category A and B boats with regards to the amount of fish they catch. So to bunch them all together and say they have to have 100% observer coverage, there is no problem as long as the government pays for it, but the industry can't afford to pay for it. I, as plant manager, will go out of business indirectly. Maybe that's what most of the people here want. But I want the Council to be more than aware of this if they are insisting on 100% observer coverage.

In regards to fishing in the groundfish closed areas, again, I wish somebody would look at the observer data. It shows little to no interaction. There were three interactions two years ago. If you take away those three instances, there wouldn't be a problem despite the ridiculously low catch cap on haddock we were given. The three instances were freakish, yet there were over 100 other tows made with little or no bycatch. One more freak incident would have closed the fishery down until May of this year when the new groundfish quota came out. That can't be looked at as a management measure.

There's another thing that nobody seems to be taking into account here. There is a massive collapse of groundfish in the Gulf of Maine. Numerous studies in Canada and Europe show predation of pelagic species directly impacts groundfish like cod and haddock. In other words, when there is an overabundance of the pelagic species, it prevents groundfish like cod and haddock recovering. There was a study done on the groundfish collapse in the Gulf of St. Lawrence in the 60s. Within a ten-year period, it rebounded dramatically. Then, it collapsed again in the 80s, and there has been no great recovery. The scientists did a study in 2000, and they discovered that the presence of pelagics, particularly herring and mackerel, directly impacted these fishes recovery. This document never took any of that into account because most of the measures I see are from a "neutral" to a "high negative." There isn't realistically any positive measure, as a plant measure in the herring and mackerel industry, that I can see from this document, which is sad to say the least. In the management program, there should be some positive for each one in the industry somewhere along the line. There is actually none for my industry.

New England Fishery Management Council
Tannery Building-50 Water Street-Mill 2-Newburyport, MA 01950

ATTENDANCE SHEET
Travel Authorization # 12-70

ATTENDANCE AT: Herring Amendment 5 Public Hearing

DATE: Wednesday, April 25, 2012 LOCATION: Hilton Hotel, Mystic, CT

CERTIFIED BY:

IMPORTANT... Any information provided on this form is subject to Freedom of Information Act (FOIA) disclosure and may be made available to anyone requesting such.

NAME	MAILING ADDRESS	TELEPHONE
D. Grout		
Paul Howard		
Chris Kellogg		
Lori Steele		
BOB VEACH	63 OLD RD CANTERBURY, CT. 06331	860-917-8688
EOIN ROCHFORD	9 FISH ISLAND, NEW BEDFORD,	774 451 1077
Peter Baker	3 Duckmore Ln Cape Cod MA	508 694 4064
Gary Libby	Port Clyde ME 04855	
RAYMOND KANE	CHATHAM MA. 02633	
David Goldsmith	Ridgefield, CT 06877	203-438-0007
Dan Salt	me Owls Head	
Victoria Calomo	NOAA Senator Scott Brown	
CHRIS KELLOGG	NEFMC Staff	

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

RECORD OF DECISION

FINAL ENVIRONMENTAL IMPACT STATEMENT

AMENDMENT 5 TO THE ATLANTIC HERRING FISHERY MANAGEMENT PLAN

National Marine Fisheries Service
Northeast Region

This document comprises the record of decision (ROD) for approval/disapproval of Amendment 5 to the Atlantic Herring Fishery Management Plan (Herring FMP), as prepared by NOAA's National Marine Fisheries Service (NMFS) pursuant to the National Environmental Policy Act (NEPA). The ROD is based on and incorporates, as described below, the Amendment 5 Final Environmental Impact Statement (FEIS) and all other decision and analytical documents prepared for this action.

Background

On May 8, 2008 (73 FR 26082), the New England Fishery Management Council (Council) published a notice of intent (NOI) to prepare an EIS for Amendment 4 to the Herring FMP to consider measures to: Improve long-term monitoring of catch (landings and bycatch) in the herring fishery, implement annual catch limits (ACLs) and accountability measures (AMs) consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and develop a sector allocation process or other limited access privilege program for the herring fishery. The Council subsequently conducted scoping meetings during May and June of 2008 to discuss and take comments on alternatives to these measures.

After considering the complexity of the issues under consideration in Amendment 4, the Council voted on June 23, 2009, to split the action into two amendments to ensure the MSA requirements for complying with provisions for ACLs and AMs would be met by 2011. The ACL and AM components moved forward in Amendment 4, all other measures formerly considered in Amendment 4 were to be considered in Amendment 5. A supplementary NOI was published on December 28, 2009, (74 FR 68577) announcing the split between the amendments, and that impacts associated with alternatives considered in Amendment 5 would be analyzed in an EIS. At that time, measures considered under Amendment 5 included: A catch-monitoring program; measures to address river herring bycatch; midwater trawl access to Northeast multispecies (groundfish) closed areas; and measures to address interactions with the Atlantic mackerel (mackerel) fishery.

Following further development of Amendment 5, the Council conducted MSA public hearings in March 2012, NEPA public hearings at the beginning of June 2012, and, following the public comment period on the draft EIS that ended June 4, 2012, the Council adopted Amendment 5 on June 20, 2012. The Council submitted Amendment 5 to NMFS for review on September 10,

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Printed on Recycled Paper

2012. Following a series of revisions, the Council submitted a revised version of Amendment 5 to NMFS on March 25, 2013.

A Notice of Availability (NOA) for the FEIS was prepared for Amendment 5, as required by NEPA, and published on April 26, 2013, (78 FR 24743) with a comment period ending May 28, 2013. In addition, as required by the MSA, an NOA for Amendment 5 published on April 22, 2013, (78 FR 23733) with a comment period ending June 21, 2013. A proposed rule was published on June 3, 2013, (78 FR 33020) with a comment period ending July 18, 2013.

The following sections briefly describe the alternatives considered in Amendment 5 and the measures adopted by the Council as part of Amendment 5. Additional discussion regarding the environmentally preferred alternatives, the factors considered in making a decision on the final action, and compliance with National Standards, are included in the following text.

Alternatives Considered in Amendment 5

The primary purposes of Amendment 5 are to: (1) Improve the collection of real-time, accurate catch information; (2) enhance the monitoring and sampling of catch at-sea; and (3) address bycatch issues through responsible management. Therefore, Amendment 5 considered alternatives related to improving the catch monitoring for the herring fishery and addressing bycatch issues. The Amendment 5 FEIS described and analyzed the alternatives, and options related to those alternatives, considered in the amendment. These alternatives and options are briefly summarized below in the order in which they are discussed in the FEIS. See Section 3 of the FEIS for a complete description of the alternatives and see Section 6 of the FEIS for a complete analysis of the alternatives.

1. Adjustments to the Fishery Management Program

Regulatory Definitions – Two options were considered: (1) Revise transfer at-sea and offload definitions for the herring fishery and (2) maintain existing transfer at-sea and offload definitions.

Administrative Provisions – Four options were considered: (1) Expand possession restrictions to all vessels working cooperatively in the herring fishery; (2) eliminate the VMS 'power down' provision for limited access herring vessels; (3) establish a new herring at-sea dealer permit for herring carrier vessels that sell fish at sea; and (4) maintain existing requirements.

Herring Carrier Vessels – Three options were considered: (1) Require vessels to declare herring carrier trips via VMS; (2) allow vessels to choose between enrolling as a herring carrier with a letter of authorization (LOA) or via VMS; and (3) maintain existing requirement for vessels to enroll as a herring carrier with an LOA.

Transfers At-Sea - Three options were considered: (1) Restrict transfers at-sea to vessels with Category A or B permits; (2) restrict transfers at-sea to vessels with herring permits; (3) maintain existing ability for all vessels to transfer herring at-sea.

Trip Notification Requirements - Three options were considered: (1) Expand and modify pre-trip notification requirements (e.g., call to Northeast Fisheries Observer Program (NEFOP), VMS activity declaration, VMS gear declaration) to all limited access vessels, vessels fishing with midwater trawl gear, vessels with the Areas 2/3 Open Access Permit, and herring carriers; (2) expand pre-landing requirement to contact NMFS Office of Law Enforcement (OLE) to all limited access vessels, vessels fishing with mid-water trawl gear, vessels with the Areas 2/3 Open Access Permit, and herring carrier vessels; and (3) Maintain existing pre-trip and pre-landing notification requirements (which apply to Category A and B vessels and vessels fishing with midwater trawl gear).

Dealer Reporting Requirements – Two options were considered: (1) Require dealers to weigh all fish and annually document methods used to determine relative species composition; (2) require dealers to weigh all fish and document methods used to determine relative species composition with each report; (3) require dealers to obtain vessel confirmation of weight of fish in each report; and (4) maintain existing requirement that dealers report the weight of fish.

Areas 2/3 Open Access Herring Permit – Three options were considered: (1) Increase open access possession limit for Herring Areas 2 and 3 to 20,000 lb; (2) increase open access possession limit for Areas 2 and 3 to 10,000 lb; and (3) maintain existing open access possession limit of 6,600 lb.

2. Adjustments to At-Sea Catch Monitoring

Observer Coverage Levels - Four options were considered: (1) Require 100-percent coverage on Category A and B vessels; (2) require Standard Bycatch Reporting Methodology (SBRM) coverage levels, not subject to re-prioritization; (3) require Council-specified coverage levels; and (4) maintain existing SBRM coverage levels, subject to re-prioritization.

Funding for Observer Coverage Levels - For Observer Coverage Level Options 1-3, two options were considered: (1) Federal and industry funding and (2) maintain existing Federal funding.

Observer Service Providers - For Observer Coverage Level Options 1-3, two options were considered: (1) States authorized as observer service providers and (2) maintain existing requirement that states must apply to become observer service providers.

Observer Coverage Waivers - For Observer Coverage Level Options 1-3, two options were considered: (1) Waivers would be issued and (2) waivers would not be issued.

Process for Review Observer Coverage Levels - For Observer Coverage Level Option 3, two options were considered: (1) Supplemental SBRM analysis and (2) Herring Plan Development Team supplemental analysis.

At-Sea Sampling Requirements - Seven options were considered: (1) Require vessels to provide observers with safe sampling stations; (2) require vessels to provide reasonable assistance to observers completing their duties; (3) require vessels to notify observers when pumping starts/stops and when observes can access the catch; (4) require observers on each vessel fishing

cooperatively; (5) require pair trawl vessels to inform observers which vessel will be landing catch; (6) require vessels to assist observers obtain visual access to codend; and (7) maintain existing at-sea sampling requirements.

Slippage (catch discarded before it was made available to an observer) Measures - Four options were considered: (1) Require released catch affidavits for slippage events; (2) prohibit slippage, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel; (3) prohibit slippage and require catch deduction and/or trip termination and released catch affidavit for slippage events; (4) maintain existing allowance for slippage.

Maximized Retention – Two options were considered: (1) Evaluate maximized retention through exempted fishing permits and (2) maintain existing possession limits.

3. Measures to Address River Herring Interactions

Time/Area Management – Three options were considered: (1) Establish River Herring Monitoring/Avoidance Areas; (2) establish River Herring Protection Areas; and (3) maintain existing herring management areas.

Measures for River Herring Monitoring/Avoidance Areas - Four options were considered: (1) Require 100-percent observer coverage; (2) prohibit slippage, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel; (3) require either 100-percent observer coverage or prohibit slippage once a catch trigger has been reached; and (4) support and evaluate an existing research program investing river herring encounters in the herring fishery.

Measures for River Herring Protection Areas – Two options were considered: (1) Prohibit fishing and (2) prohibit fishing once a catch trigger has been reached.

River Herring Catch Caps – Two options were considered: (1) Establish a mechanism to consider implementing river herring catch cap through a future framework adjustment or specifications process and (2) maintain existing ability to consider river herring catch caps in the future amendment.

4. Measures to Address Midwater Trawl Access to Groundfish Closed Areas

Measures for Midwater Trawl Vessels in Groundfish Closed Areas – Five options were considered: (1) Allow access all areas without increased monitoring requirements; (2) require 100-percent observer coverage; (3) require 100-percent coverage and prohibit catch being discarded before it has been made available to an observer, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel and require a released catch affidavit for discard events; (4) prohibit midwater trawl gear; and (5) maintain existing monitoring and sampling requirements in Closed Area I only.

5. Adjustments to List of Measures Modified Through Framework Adjustments or Specifications

Measures Modified Through a Framework or Specifications – Two options were considered: (1) Revise list of measures that can be established through a framework adjustment or fishery specifications to include measures established in Amendment 5 and (2) maintain current list of measures that can be established through a framework adjustment or fishery specifications.

Measures Adopted by the Council

On June 20, 2012, the Council adopted the following measures as part of Amendment 5, after considering recommendations from the Herring Oversight Committee, Herring Advisory Panel, and public comment received on the draft EIS.

1. Adjustment to the Fishery Management Program

- Revise the herring transfer at-sea and offload definitions to better document the transfer of fish;
- Expand possession limit restrictions to all vessels working cooperatively, consistent with pair trawl requirements;
- Eliminate the VMS power-down provision for limited access herring vessels, consistent with VMS provisions for other fisheries;
- Establish an "At-Sea Herring Dealer" permit to better document the at-sea transfer and sale of herring;
- Allow vessels to enroll as herring carriers with either a VMS declaration or LOA to increase operational flexibility;
- Expand pre-trip and pre-landing notification requirements, as well as adding a VMS gear declaration, to all limited access herring vessels, vessels fishing with midwater trawl gear, vessels issued an Areas 2/3 Open Access Permit, and herring carriers to help facilitate monitoring;
- Require dealers to weigh all fish and document methods used to determine species composition with each report; and
- Establish an "Areas 2/3 Open Access Permit" to reduce the potential for the regulatory discarding of herring in the Atlantic mackerel fishery.

2. Adjustments to At-Sea Catch Monitoring

- Require 100-percent observer coverage on Category A and B vessels and an industry contribution of a target maximum of $325 per day;
- Allow 100-percent observer coverage requirement to be waived if no observers are available, but not for trips in the River Herring Monitoring/Avoidance Areas;
- Re-evaluate the 100-percent observer coverage requirement 2 years after implementation;
- Apply existing observer service provider requirements to the herring fishery and authorize states as observer service providers;
- Expand vessel requirements related to at-sea observer sampling to help ensure safe sampling and improve data quality;

- Prohibit slippage, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel, and require a released catch affidavit to be completed for each slippage event; and
- Establish a slippage cap for each herring management area (10 slippage events by gear type) and require vessels slipping catch after the cap has been reached to immediately stop fishing and return to port.

3. Measures to Address River Herring Interatcions

- Establish River Herring Monitoring/Avoidance Areas;
- Evaluate the existing river herring bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters in River Herring Monitoring/Avoidance Areas; and
- Establish the ability to consider a river herring catch cap in a future framework.

4. Measure to Address Midwater Trawl Access to Groundfish Closed Areas

- Require 100-percent observer coverage on midwater trawl vessels fishing in groundfish closed areas; and
- Prohibit catch being discarded before it has been made available to an observer on midwater trawl vessels fishing in groundfish closed areas, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel, and require a released catch affidavit to be completed for each discard event.

5. Adjustments to List of Measures Modified Through Framework Adjustments or Specifications

- Revise list of measures that can be established through a framework adjustment and/or fishery specifications to include measures established in Amendment 5.

Factors Considered in Making a Decision on the Final Action

The CEQ's regulations for implementing the procedural provisions of NEPA require agencies to not only state the outcome of the decisions, but also to discuss how the decision was affected by the preferences among alternatives and to identify and discuss all factors that led to the decision. In making a decision regarding approval of measures in Amendment 5, NMFS considered the analysis of alternatives in the FEIS, associated environmental impacts, and the extent to which the impacts could be mitigated. NMFS also considered the objectives of the final action as they relate to the MSA and other applicable law and public comment.

The goal of the Herring FMP is to manage the herring fishery at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The objectives of the Herring FMP are to:

- Harvest the herring resource, consistent with the definition of overfishing contained in the Herring FMP, and prevent overfishing.
- Prevent the overfishing of discrete spawning components of herring.

- Avoid patterns of fishing mortality by age which adversely affect the age structure of the stock.
- Provide for the orderly development of the herring fishery in inshore and offshore areas, taking into account the viability of current and historical participants in the fishery.
- Provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery while minimizing waste from discards in the fishery.
- Prevent excess capacity in the harvesting sector.
- Minimize, to the extent practicable, the race to fish for 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 U.S. 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 Atlantic States Marine Fisheries Commission.

The goal of Amendment 5 is to improve catch monitoring and ensure compliance with the MSA. The objectives of Amendment 5 are to:

- Implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;
- Implement other management measures as necessary to ensure compliance with the MSA;
- Implement management measures to address bycatch in the herring fishery; and
- In the context of the previous three bullets, consider the health of the herring resource and the important role of herring as a forage fish and a predator fish throughout its range.

When making a final decision on an action, NMFS must consider the relevance of the proposed measures to the goals and objectives of both the Herring FMP and Amendment 5, and the effectiveness of each option in achieving such goals and objectives.

NMFS must consider the approval of an FMP amendment relative to the requirements of the MSA. The MSA states that "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." As required, NMFS evaluated Amendment 5 relative to the National Standards described in section 301 of the MSA, and found the action to be consistent with these standards. A summary of the rationale for the determination of compliance is in Section 7.1 of the FEIS.

In addition to the National Standards, section 303(a) of the MSA includes 15 required provisions for FMPs. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, must comply with these requirements. Section 7.2 of the FEIS describes these requirements and the basis for determining that the measures included in Amendment 5 comply with the required provisions.

Section 303(b) of the MSA also includes discretionary provisions for FMPs that the Council can decide to include if it determines the provisions are necessary and appropriate for the management of the fishery. Several discretionary provisions relevant to Amendment 5 are described below.

Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, may:

- Require a permit to be obtained from, and fees to be paid to, the Secretary, with respect to any fishing vessel of the United States fishing, or wishing to fish, in the exclusive economic zone or for anadromous species or Continental Shelf fishery resources beyond such zone;
- Prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement of the provisions of this Act;
- Require that one or more observers be carried on board a vessel of the United States engaged in fishing for species that are subject to the plan, for the purpose of collecting data necessary for the conservation and management of the fishery; except that such a vessel shall not be required to carry an observer on board if the facilities of the vessel for the quartering of an observer, or for carrying out observer functions, are so inadequate or unsafe that the health or safety of the observer or the safe operation of the vessel would be jeopardized;
- Assess and specify the effect which the conservation and management measures of the plan will have on the stocks of naturally spawning anadromous fish in the region;
- Include, consistent with the other provisions of this Act, conservation and management measures that provide harvest incentives for participants within each gear group to employ fishing practices that result in lower levels of bycatch or in lower levels of the mortality of bycatch;
- Include management measures in the plan to conserve target and non-target species and habitats, considering the variety of ecological factors affecting fishery populations; and
- Prescribe such other measures, requirements, or conditions and restrictions as are determined to be necessary and appropriate for the conservation and management of the fishery.

NMFS has determined that the measures developed in Amendment 5 comply with these MSA discretionary provisions, as described in more detail below.

In addition to the MSA and NEPA, NMFS also considers other laws that relate to the implementation of FMPs and FMP amendments. NMFS evaluated Amendment 5 relative to the laws described below and has determined that the all of the approved Amendment 5 measures, singly and combined, comply with the following laws and minimize impacts relevant to these laws. The basis for NMFS's determination of compliance with these laws, and information to meet the requirements relative to these laws, is provided in Section 8 of the FEIS and in the NMFS Regional Administrator's (RA's) decision memorandum included with this ROD for the approval of Amendment 5.

<u>Decision on the Final Action: Measures Approved/Disapproved in Amendment 5</u>

NMFS approves all measures adopted by the Council in Amendment 5 and listed above, with the following exceptions:

- Require dealers to weigh all fish and document methods used to determine species composition with each report;

- Require 100-percent observer coverage on Category A and B vessels and an industry contribution of a target maximum of $325 per day;
- Allow 100-percent observer coverage requirement to be waived if no observers are available, but not for trips in the River Herring Monitoring/Avoidance Areas;
- Re-evaluate the 100-percent observer coverage requirement 2 years after implementation;
- Apply existing observer service provider requirements to the herring fishery and authorize states as observer service providers; and
- Establish a slippage cap for each herring management area (10 slippage events by gear type) and require vessels slipping catch after the cap has been reached to immediately stop fishing and return to port.

The decision to partially approve Amendment 5 is based on the rationale contained in the NMFS Regional Administrator's (RA's) decision memorandum that accompanies this ROD, the analyses prepared for Amendment 5 and the FEIS, and all other analytical documents prepared for this action during the course of its development. In making the decision to partially approve Amendment 5, NMFS evaluated the proposed action relative to the MSA, including the national standards, associated guidelines, and required and discretionary provisions, in addition to all other applicable law listed above, and public comment.

The Council has spent several years developing this amendment, and it contains many measures that would improve herring management and that can be administered by NMFS. NMFS supports improvements to fishery dependent data collections, be it through increasing reporting requirements or expanding the at-sea monitoring of the herring fishery. NMFS also shares the Council's concern for reducing bycatch and unnecessary discarding.

However, the requirements for 100-percent observer coverage coupled with an industry contribution of $325 per day, the slippage cap, and the dealer reporting requirement lack adequate rationale or development by the Council, and NMFS has utility and legal concerns about the implementation of these measures. NMFS expressed its concerns about the implementation of these measures throughout the development of this amendment. Additionally, NMFS articulated its concerns with these measures in a comment letter on the draft EIS (dated June 5, 2012) that was provided to the Council prior to the Council taking final action on Amendment 5 on June 20, 2012. The proposed rule for Amendment 5 described NMFS concern about these measures' consistency with the MSA and other applicable law. After review of public comments received during the NOA comment period for the amendment, NMFS made the determination to partially approve Amendment 5.

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., Case No. 11-660. The Court ordered remedial action to address deficiencies identified by the Court with respect to Amendment 4 to the Herring FMP. Amendment 5 includes consideration of measures that will

serve as part of the remedial action to address the Court's findings that NMFS did not adequately consider: Whether Amendment 4 minimized bycatch to the extent practicable; or the environmental impacts of a reasonable range of alternatives for minimizing bycatch. The Court requires a completed NEPA analysis for Amendment 5 to be filed with the Court by August 2, 2013. Amendment 5's NEPA analysis was considered completed when the NOA for the FEIS published in the Federal Register on April 26, 2013.

Under the MSA, NMFS may only approve, disapprove, or partially approve an action submitted by the Council; NMFS may not select other alternatives that were not adopted by the Council. A summary of the rationale and justification for approving or disapproving the measures is provided below.

1. Adjustments to the Fishery Management Program

Amendment 5 revises several existing fishery management provisions, such as regulatory definitions, reporting requirements, and VMS requirements, and establishs new provisions, such as additional herring permits and increased operational flexibility for herring carriers, to better administer the herring fishery.

Definitions

Amendment 5 revises the regulatory definitions of transfer at-sea and offload to clarify these activities for the herring fishery. Amendment 5 defines a herring transfer at-sea as a transfer of fish from one herring vessel (including fish from the hold, deck, codend, or purse seine) to another vessel, with the exception of fish moved between vessels engaged in pair trawling. Amendment 5 also defines a herring offload as removing fish from a herring vessel to be sold to a dealer. Both transfers at-sea and offloading are frequent activities in the herring fishery, and the differences between these activities are not always well understood. These definition revisions attempt to more clearly differentiate between activities that trigger reporting requirements. By clarifying these activities for the herring fishery, fishery participants are more likely to report these activities consistently, thereby improving reporting compliance, helping ensure data accuracy and completeness, and lessening the likelihood of double counting herring catch.

Herring Carriers

Amendment 5 revises operating provisions for herring carrier vessels by establishing an At-Sea Herring Dealer permit for herring carriers that sell fish, allowing vessels to declare herring carrier trips via VMS, and exempting herring carriers from vessel trip report (VTR) requirements. Currently, herring carriers are vessels that may receive and transport herring caught by another fishing vessel, provided the herring carrier has been issued a herring permit, does not have any gear on board capable of catching or processing herring, and has been issued an LOA from the NMFS RA. The herring carrier LOA exempts the herring carrier from possession limits and catch reporting requirements associated with the vessel's herring permit. To allow time for the processing, issuance, and, if necessary, cancelation of the LOAs, the herring carrier LOAs have a minimum 7-day enrollment period. During the LOA enrollment

period, vessels may only act as herring carriers and they may not fish for any species or transport species other than herring.

Amendment 5 allows vessels to choose between enrolling as a herring carrier with an LOA or declaring a herring carrier trip via VMS. If a vessel chooses to declare a herring carrier trip via VMS, it would be allowed to receive and transport herring caught by another fishing vessel provided the herring carrier has been issued a herring permit, does not have any gear on board capable of catching or processing fish, and only transports herring. By declaring a herring carrier trip via VMS, a vessel would be exempt from the catch reporting (i.e., daily VMS reporting) associated with its herring permit and not bound by the 7-day enrollment period of the LOA. A vessel declaring a herring carrier trip via VMS may only act as a herring carrier and may not fish for any species or transport species other than herring. This measure would increase operational flexibility by allowing vessels to schedule herring carrier trips on a trip-by-trip basis. Vessels that do not possess a VMS or choose not to declare a herring trip via VMS may still act as carriers by obtaining a herring carrier LOA from the NMFS RA and operating in accordance with the LOA requirements.

Herring carriers typically receive herring from harvesting vessels and transport those herring to Federal dealers. The harvesting vessel reports those herring as catch, and dealers report those herring as a purchase. NMFS verifies the amount of herring caught by comparing the amount reported by the harvesting vessel against the amount reported by the dealer. If the herring transported by a herring carrier is not purchased by a Federal dealer, then NMFS does not have any dealer reports to compare to the vessel reports. Amendment 5 establishes an At-Sea Atlantic Herring Dealer Permit that would be required for herring carriers that sell herring, rather than deliver those fish on behalf of a harvesting vessel to a dealer for purchase. This permit would require compliance with Federal dealer reporting requirements. Vessels that have both an At-Sea Atlantic Herring Dealer Permit and a Federal fishing permit would be required to fulfill the reporting requirements of both permits while in possession of both permits, as appropriate. NMFS expects the reporting requirements for the At-Sea Atlantic Herring Dealer Permit to minimize instances where catch is reported by harvesting vessels but then cannot be matched to dealer reports; thereby improving catch monitoring in the herring fishery.

Amendment 5 exempts herring carriers from the vessel trip report (VTR) requirements associated with their vessel permits. Vessels issued herring permits are required to submit weekly VTRs to NMFS. However, dealers have incorrectly attributed catch to herring carrier vessels, rather than correctly attributed catch to the appropriate harvesting vessel, by reporting the herring carrier's VTR serial number rather than the VTR serial number of the harvesting vessel. To help prevent catch being attributed to the wrong vessel and minimize data mismatches between vessel and dealer reports, Amendment 5 exempts herring carriers from the VTR requirement associated with their herring permit. Dealers would still be responsible for correctly reporting the VTR serial number of the vessel that harvested the herring.

Open Access Herring Permits

Amendment 5 establishes a new open access herring permit for vessels engaged in the mackerel fishery and re-names the current open access herring permit. The existing open access herring

permit (Category D) allows a vessel to possess up to 6,600 lb of herring per trip, limited to one landing per calendar day, in or from any of the herring management areas. All the provisions and requirements of the existing open access herring permit would remain the same, but the Category D permit would be renamed the All Areas Open Access Herring Permit, and this action would create a new open access permit for mackerel fishery participants fishing in herring management Areas 2 and 3.

The new Areas 2/3 Open Access Herring Permit (Category E) allows vessels to possess up to 20,000 lb of herring per trip, limited to one landing per calendar day, in or from herring management Areas 2 and 3. Vessels that have not been issued a limited access herring permit but have been issued a limited access mackerel permit would be eligible for the Areas 2/3 Open Access Herring Permit. Vessels may hold both open access herring permits at the same time.

In its letter to NMFS deeming the proposed regulations for Amendment 5, the Council requested that NMFS clarify the reporting and monitoring requirements associated with the new Category E permit. Amendment 5 states that Category E permits would be subject to the same notification and reporting requirements as Category C (Incidental Catch Limited Access Herring Permit) vessels. Therefore, the proposed notification and reporting requirements associated with this new permit would be consistent with the requirements for Category C vessels, including the requirement to possess and maintain a VMS, VMS activity declaration requirements, and catch reporting requirements (i.e., submission of daily VMS catch reports and weekly VTRs).

Amendment 5 does not state that Category E permits would be subject to the same catch monitoring requirements as Category C vessels, including the proposed vessel requirements to help improve at-sea sampling and measures to minimize the discarding of catch before it has been made available to observers for sampling. When describing or analyzing catch monitoring requirements, Amendment 5 does not describe extending catch monitoring requirements for Category C vessels to Category E vessels, nor does it analyze the impacts of catch monitoring requirements on Category E vessels. Because the Category C catch monitoring requirements were not discussed or analyzed in relation to Category E vessels, those catch monitoring requirements do not apply to Category E vessels.

There is significant overlap between the mackerel and herring fisheries. Mackerel and herring co-occur, particularly during January through April, which is a time that vessels often participate in both fisheries. Not all vessels participating in the mackerel fishery qualify for a limited access herring permit because they either did not have adequate herring landings or they are new participants in the mackerel fishery. Currently, vessels issued an open access herring permit and participating in the mackerel fishery are required to discard any herring in excess of the open access permit's 6,600-lb possession limit. The creation of the new Areas 2/3 Open Access Herring Permit is intended to minimize the potential for regulatory discarding of herring by limited access mackerel vessels that did not qualify for a limited access herring permit, especially if effort in the Atlantic mackerel fishery should approach historical levels, consistent with MSA National Standard 9's requirement to minimize bycatch to the extent practicable.

Trip Notification and VMS Requirements

Amendment 5 expands and modifies trip notification and VMS requirements for vessels with herring permits to assist with observer deployment and provide enforcement with advance notice of trip information to facilitate enforcement monitoring of landings. Currently, vessels with Category A or B permits, as well as any vessels fishing with midwater trawl gear in Areas 1A, 1B, and/or 3, are required to contact NMFS at least 72 hr in advance of a fishing trip to request an observer. Amendment 5 modifies this pre-trip observer notification requirement, such that vessels with limited access herring permits, vessels with open access Category D permits fishing with midwater trawl gear in Areas 1A, 1B, and/or 3, vessels with open access Category E permits, and herring carrier vessels would be required to contact NMFS at least 48 hr in advance of a fishing trip to request an observer. This measure would assist NMFS's scheduling and deployment of observers across the herring fleet, with minimal additional burden on the industry, helping ensure that observer coverage targets for the herring fishery are met. NMFS intends for the change from a 72-hr notification requirement to a 48-hr notification requirement to allow vessels more flexibility in their trip planning and scheduling. If a vessel is required to notify NMFS to request an observer before its fishing trip, but it does not notify NMFS before beginning the fishing trip, that vessel would be prohibited from possessing, harvesting, or landing herring on that trip. If a fishing trip is cancelled, a vessel representative must notify NMFS of the cancelled trip, even if the vessel is not selected to carry an observer. All waivers or selection notices for observer coverage will be issued by NMFS to the vessel via VMS so the vessel would have an on-board verification of either the observer selection or waiver. However, a vessel is still subject to the more restrictive 72-hr notification associated with the groundfish midwater trawl or purse seine gear exempted fisheries specified at 50 CFR § 648.80(d)-(e).

Vessels with limited access herring permits are currently subject to a VMS activity declaration. Amendment 5 expands that VMS activity declaration requirement and adds a gear code declaration. Therefore, vessels with limited access herring permits, Category E permits, and vessels declaring herring carrier trips via VMS must notify NMFS via VMS of their intent to participate in the herring fishery prior to leaving port on each trip by entering the appropriate activity and gear codes in order to harvest, possess, or land herring on that trip.

Currently, vessels with Category A or B permits, and vessels with a Category C permits fishing with midwater trawl gear in Areas 1A, 1B, and/or 3 are subject to a pre-landing VMS notification requirement. Amendment 5 expands this pre-landing VMS notification requirement so that vessels with limited access herring permits, Category E permits, and vessels declaring herring carrier trips via VMS must notify NMFS OLE via VMS of the time and place of offloading at least 6 hr prior to crossing the VMS demarcation line on their return trip to port, or if a vessel does not fish seaward of the VMS demarcation line, at least 6 hr prior to landing.

Limited access herring vessels are currently able to turn off (i.e., power-down) their VMS when in port, if they do not hold other permits requiring continuous VMS reporting. Vessels authorized to turn off their VMS in port must submit a VMS activity declaration prior to leaving port. Amendment 5 prohibits vessels with herring permits from turning off their VMS when in port, unless specifically authorized by NMFS. A vessel representative would request a letter of exemption (LOE) from NMFS to turn off its VMS if that vessel will be out of the water for more than 72 hr. Herring vessels would not be allowed to turn off their VMS until they have received an LOE from NMFS. Additionally, a vessel owner would be able to sign a herring vessel out of

the VMS program for a minimum of 30 days by requesting and obtaining an LOE from NMFS. When VMS units are turned off, consistent with an LOE, the vessel would not be able to leave the dock until the VMS unit was turned back on. Amendment 5 prohibits herring vessels from turning off VMS units in port to improve the enforcement of herring regulations and help make herring VMS regulations consistent with VMS regulations in other Northeast fisheries.

Possession Limits

All herring vessels engaged in pair trawling must hold herring permits, and their harvest is limited by the most restrictive possession limit associated with those permits. Amendment 5 expands this restriction to all vessels working cooperatively in the herring fishery, including purse seine vessels and vessels that transfer herring at-sea. Therefore, under Amendment 5, each vessel working cooperatively in the herring fishery, including vessels pair trawling, purse seining, and transferring herring at-sea, must be issued a herring permit and would be subject to the most restrictive possession limit associated with the permits issued to those vessels working cooperatively. This measure establishes consistent requirements for vessels working cooperatively in the herring fishery and may improve enforcement of herring possession limits for multi-vessel operations.

Dealer Reporting Requirements

During the development of Amendment 5, some stakeholders expressed concern that herring catch is not accounted for accurately and that there needs to be a standardized method to determine catch. In an effort to address that concern, Amendment 5 proposed that herring dealers to accurately weigh all fish and, if catch is not sorted by species, dealers would be required to document for each transaction how they estimate relative species composition. During the development of Amendment 5, NMFS identified potential concerns with the utility of this measure.

Dealers are currently required to accurately report the weight of fish, which is obtained by scale weights and/or volumetric estimates. Because this proposed measure does not specify how fish are to be weighed and still allows volumetric estimates, this proposed measure may not change dealer behavior and, therefore, the requirement may not lead to any measureable change in the accuracy of catch weights reported by dealers. Further, this measure does not provide standards for estimating species composition. Without standards for estimating species composition or for measuring the accuracy of the estimation method, NMFS may be unable to evaluate the sufficiency of the methods used to estimate species composition. For these reasons, the requirement for dealers to document the methods used to estimate species composition may not improve the accuracy of dealer reporting.

While the measure requiring dealers to document methods used to estimate species composition may not have direct utility in monitoring catch in the herring fishery, it may still inform NMFS's and the Council's understanding of the methods used by dealers to determine species weights. That information may aid in development of standardized methods for purposes of future rulemaking. Furthermore, full and accurate reporting is a permit requirement; failure to do so could render dealer permit renewals incomplete, precluding renewal of the dealer's permit.

Therefore, there is incentive for dealers to make reasonable efforts to document how they estimate relative species composition, which may increase the likelihood that useful information will be obtained as a result of this requirement.

In light of the forgoing, NMFS evaluated whether the proposed measure has practical utility, as required by the MSA and the Paperwork Reduction Act, that outweighs the additional reporting and administrative burden on the dealers. In particular, NMFS considered whether and how the proposed measure helps prevent overfishing, promotes the long-term health and stability of the herring resource, monitors the fishery, facilitates inseason management, or judges performance of the management regime.

After reviewing the measure, NMFS determined that this measure would not measurably improve the accuracy of dealer reporting or the management of the herring resources. NMFS also determined that this measure does not comply with National Standard 7's requirement to minimize costs and avoid unnecessary duplication, and the Paperwork Reduction Act's requirement for the utility of the measure to outweigh the additional reporting and administrative burden on the dealers. Therefore, NMFS disapproves the dealer reporting requirements. With the disapproval of this measure, NMFS approves the no action alternative that maintains the existing requirement that dealers accurately report the weight of fish.

2. Adjustments to At-Sea Catch Monitoring

One of the primary goals of Amendment 5 is to improve catch monitoring in the herring fishery. Amendment 5 revises existing measures associated with at-sea monitoring, such as observer coverage levels and vessel requirements to assist observers sampling at-sea. Amendment 5 also establishes new provisions to monitor catch in the herring fishery, such as measures to minimize the discarding of catch before it has been sampled by an observer.

Observer Coverage Levels

Northeast fisheries regulations specify requirements for vessels carrying NMFS-approved observers, such as providing observers with food and accommodations equivalent to those made available to the crew, allowing observers to access the vessel's bridge, decks, and spaces used to process fish, and allowing observers access to vessel communication and navigations systems. Amendment 5 expands these requirements, such that vessels issued limited access permits and carrying NMFS-approved observers must provide observers with the following: (1) A safe sampling station adjacent to the fish deck, and a safe method to obtain and store samples; (2) reasonable assistance to allow observers to complete their duties; (3) advance notice when pumping will start and end and when sampling of the catch may begin; and (4) visual access to net/codend or purse seine and any of its contents after pumping has ended, including bringing the codend and its contents aboard if possible. Additionally, Amendment 5 requires vessels issued limited access permits working cooperatively in the herring fishery to provide NMFS-approved observers with the estimated weight of each species brought on board or released on each tow. These measures are anticipated to help improve at-sea catch monitoring in the herring fishery by enhancing the observer's ability collect quality data in a safe and efficient manner.

Currently, observer coverage levels in the herring fishery are determined by the Northeast Fisheries Science Center, based on the SBRM, after consultations with the Council, and funded by NMFS. Amendment 5 proposes to increase the observer coverage in the herring fishery by requiring 100-percent observer coverage on Category A and B vessels. Many stakeholders believe this measure is necessary to accurately determine the extent of bycatch and incidental catch in the herring fishery. The Council recommended this measure to gather more information on the herring fishery so that it may better evaluate and, if necessary, implement additional measures to address issues involving catch and discards. The 100-percent observer requirement is coupled with a target maximum industry contribution of $325 per day. The at-sea costs associated with an observer in the herring fishery are higher than $325 per day. The Department of Commerce Office of General Counsel has advised that cost-sharing violates the Anti-Deficiency Act. Therefore, there is no current legal mechanism to allow cost-sharing of at-sea costs between NMFS and the industry.

Throughout the development of Amendment 5, NMFS advised the Council that Amendment 5 must identify a funding source for increased observer coverage because NMFS's annual appropriations for observer coverage are not guaranteed. Requiring 100-percent observer coverage would amount to an unfunded mandate. Because Amendment 5 does not identify a funding source to cover all of the increased costs of observer coverage, the proposed 100-percent observer coverage requirement is not sufficiently developed to approve at this time. With the disapproval of this measure, NMFS approves the no action alternative that maintains the existing SBRM observer coverage levels and Federal observer funding for the herring fishery.

Recognizing these funding challenges, the Council recommended status quo observer coverage levels and funding for up to 1 year following the implementation of Amendment 5, with the 100-percent observer coverage and partial industry funding requirement to become effective 1 year after the implementation of Amendment 5. During that year, the Council and NMFS, in cooperation with the industry, would attempt to develop a way to fund 100-percent observer coverage. A technical team, comprised of Council, Mid-Atlantic Fishery Management Council, and NMFS staff, is currently attempting to develop a legal mechanism to allow the at-sea costs of increased observer coverage to be funded by the industry. Even though 100-percent observer coverage measure in Amendment 5 cannot be approved at this time, the team will continue to work on finding a funding solution to pay for the at-sea cost of the observer coverage in the herring fishery. If the technical team can develop a way to fund the at-sea costs of 100-percent observer coverage, a new measure requiring 100-percent observer coverage on Category A and B vessels may be implemented in a future action, perhaps within the 1-year period specified in Amendment 5, subject to NMFS's budget appropriations and other observer data collection needs in the Northeast Region and elsewhere in the country.

Additionally, other measures in Amendment 5 are expected to help improve monitoring in the herring fishery, despite the disapproval of the 100-percent observer coverage measure. These measures include the requirement for vessels to contact NMFS at least 48 hr in advance of a fishing trip to facilitate the placement of observers, observer sample station and reasonable assistance requirements to improve an observer's ability collect quality data in a safe and efficient manner, and prohibiting slippage on midwater trawl vessels fishing in groundfish closed areas to minimize the discarding of unsampled catch.

The same measure that would have required 100-percent observer coverage, coupled with a $325 contribution by the industry, also proposed to require that: (1) The 100-percent coverage requirement would be re-evaluated by the Council 2 years after implementation; (2) the 100-percent coverage requirement would be waived if no observers were available, but not waived for trips that enter the River Herring Monitoring/Avoidance Areas; (3) observer service provider requirements for the Atlantic sea scallop fishery would apply to observer service providers for the herring fishery; and (4) states would be authorized as observer service providers. Because these additional measures are inseparable from the 100-percent observer coverage requirement, these measures must also be disapproved. With the disapproval of these measures, NMFS approves the no action alternative that maintains the existing waiver and observer service provider requirements.

Measures to Address Slippage

Amendment 5 requires limited access vessels to bring all catch aboard the vessel and make it available for sampling by an observer. This measure is likely to improve the quality of at-sea monitoring data by reducing the discarding of unsampled catch. If catch is discarded before it has been made available to the observer, that catch is defined as slippage. Fish that cannot be pumped and remain in the net at the end of pumping operations are considered operational discards and not slipped catch. Vessels may make test tows without pumping catch on board, provided that all catch from test tows is available to the observer when the following tow is brought aboard. Some stakeholders believe that slippage is a serious problem in the herring fishery because releasing catch before an observer can estimate its species composition undermines accurate catch accounting.

Amendment 5 allows catch to be slipped if: (1) Bringing catch aboard compromises the safety of the vessel; (2) mechanical failure prevents the catch from being brought aboard; or (3) spiny dogfish prevents the catch from being pumped aboard. But if catch is slipped, the vessel operator would be required to complete a released catch affidavit within 48 hr of the end of the fishing trip. The released catch affidavit would detail: (1) Why catch was slipped; (2) an estimate of the quantity and species composition of the slipped catch; and (3) the time and location of the slipped catch.

Additionally, Amendment 5 proposed establishing slippage caps for the herring fishery. Once there had been 10 slippage events in a herring management area by vessels using a particular gear type (including midwater trawl, bottom trawl, and purse seine) and carrying an observer, vessels that subsequently slip catch in that management area, using that particular gear type and carrying an observer, would be required to immediately return to port. NMFS would track slippage events and notify the fleet once a slippage cap had been reached. Slippage events due to spiny dogfish preventing the catch from being pumped aboard the vessel would not count against the slippage caps, but slippage events due to safety concerns or mechanical failure would count against the slippage caps. The Council recommended these slippage caps to discourage the inappropriate use of the slippage exceptions, and to allow for some slippage, but not unduly penalize the fleet.

Throughout the development of Amendment 5 NMFS identified potential concerns with the rationale supporting, and legality of, the slippage caps. The need for, and threshold for triggering, a slippage cap (10 slippage events by area and gear type) does not appear to have a strong biological or operational basis. Recent observer data (2008-2011) indicate that the estimated amount of slipped catch is relatively low (approximately 1.25 percent) compared to total catch. Observer data also indicate that the number of slippage events is variable across years. During 2008-2011, the number of slippage events per year ranged between 35 and 166. The annual average number of slippage events by gear type during 2008, 2009, and 2011 are as follows: 4 by bottom trawl; 36 by purse seine; and 34 by midwater trawl. Because the frequency of slippage was not consistently analyzed by gear type and management area, NMFS believes it difficult to use the analysis in the FEIS to support the selection of trigger for the slippage caps.

Once a slippage cap has been met, vessels that slip catch, even if the reason for slipping was safety or mechanical failure, would be required to immediately stop fishing and return to port. Vessels may continue fishing following slippage events 1 through 10, but must return to port following the 11th slippage event, regardless of the vessel's role in the first 10 slippage events. As designed, the requirement to return to port is arbitrarily applied. Additionally, this measure may result in a vessel operator having to choose between trip termination and bringing catch aboard despite a safety concern. For these reasons, NMFS believes this measure is inconsistent with the Administrative Procedure Act (APA) and MSA National Standards 2 and10.

The measures to minimize slippage are based on the sampling requirements for midwater trawl vessels fishing in Groundfish Closed Area I. However, there are important differences between these measures. Under the Closed Area I requirements, if midwater trawl vessels slip catch, they are allowed to continue fishing, but they must leave Closed Area I for the remainder of that trip. The requirement to leave Closed Area I is less punitive than the proposed requirement to return to port. Therefore, if the safety of bringing catch aboard is a concern, leaving Closed Area I and continuing to fish would likely be an easier decision for a vessel operator to make than the decision to return to port. Additionally, because the consequences of slipping catch apply uniformly to all vessels under the Closed Area I requirements, inequality among the fleet is not an issue for the Closed Area I requirements, like it is for the proposed slippage caps.

In 2010, the 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, including slippage, such as why catch was discarded, the estimated amount of discarded catch, and the estimated composition of discarded catch. Recent slippage data collected by observers indicate that: Information about these events, and the amount and composition of fish that are slipped, has improved; and the number of slippage events by limited access herring vessels has declined. Given NEFOP's recent training changes and its addition of a discard log, NMFS believes that observer data on slipped catch, rather than released catch affidavits, provide the best information to account for discards. However, there is still a compliance benefit to requiring a released catch affidavit because it would provide enforcement with a sworn statement regarding the operator's decisions and may help to understand why slippage occurs.

After careful evaluation, NMFS approves the measures to prohibit slippage, with exceptions for safety, mechanical failure, and excessive spiny dogfish catch, and require that a released catch affidavit be completed for slippage events. These measures are separable from the slippage caps and are expected to improve catch and bycatch data in the herring fishery, by ensuring all catch is available for sampling by an observer, and provide information to help understand why slippage occurs. Additionally, NMFS disapproves the slippage caps because, as described above, NMFS believes the measure is inconsistent with the APA and MSA National Standards 2 and 10.

Even through the slippage caps are disapproved, the prohibition on slippage, the released catch affidavit, and the ongoing data collection by NEFOP, and 100-percent observer coverage requirement for midwater trawl vessels fishing in groundfish closed areas still allow for improved monitoring in the herring fishery, increased information regarding discards, and an incentive to minimize the discarding of unsampled catch.

3. Measures to Address River Herring Interactions

Amendment 5 establishes several measures to address the catch of river herring in the herring fishery to minimize bycatch and bycatch mortality to the extent practicable. River herring are managed by the ASMFC and individual states. According to the most recent ASMFC river herring stock assessment (May 2012), river herring populations have declined from historic levels and many factors will need to be addressed to allow their recovery, including fishing (in both state and Federal waters), river passageways, water quality, predation, and climate change. In an effort to aid in the recovery of depleted or declining stocks, the ASMFC, in cooperation with individual states, prohibited state waters commercial and recreational fisheries that did not have approved sustainable fisheries management plans, effective January 1, 2012. NMFS considers river herring to be a species of concern and a candidate species under the Endangered Species Act (ESA). NMFS is currently determining whether listing river herring as threatened or endangered under the ESA is warranted.

River Herring Monitoring/Avoidance Areas

Amendment 5 establishes River Herring Monitoring/Avoidance Areas for the herring fishery. These are bimonthly areas to monitor river herring catch and encourage river herring avoidance. The coordinates for these areas are described in the proposed regulations at 50 CFR 648.200(f)(4). The areas are based on NEFOP data between 2005 and 2009 where river herring catch (greater than 40 lb occurred in the herring fishery. Once established, the River Herring Monitoring/Avoidance Areas would be subject to the Amendment 5 proposed measures to prohibit slippage. While the magnitude of the effect of river herring bycatch on river herring populations is unknown, minimizing river herring bycatch to the extent practicable is one of the purposes of Amendment 5.

Amendment 5 also establishes a mechanism to develop, evaluate, and consider regulatory requirements for a river herring bycatch avoidance strategy in the herring fishery. The river herring bycatch avoidance strategy would be developed and evaluated by the Council, in cooperation with participants in the herring fishery, specifically the Sustainable Fisheries

Coalition (SFC); the Massachusetts Division of Marine Fisheries (MA DMF); and the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST). This measure is based on the existing river herring bycatch avoidance program involving SFC, MA DMF, and SMAST. This voluntary program seeks to reduce river herring and shad bycatch by working within current fisheries management programs, without the need for additional regulatory requirements. The river herring bycatch avoidance program includes portside sampling, real-time communication with the SFC on river herring distribution and encounters in the herring fishery, and data collection to evaluate if oceanographic features may predict high rates of river herring encounters.

Phase I of the river herring bycatch avoidance strategy includes: (1) Increased monitoring and sampling of herring catch from the River Herring Monitoring/Avoidance Areas; (2) providing for adjustments to the River Herring Monitoring/Avoidance Area and river herring bycatch avoidance strategies through a future framework adjustment to the Herring FMP; and (3) Council staff collaboration with SFC, MA DMF, and SMAST to support the ongoing project evaluating river herring bycatch avoidance strategies.

Upon completion of the existing SFC/MA DMF/SMAST river herring bycatch avoidance project, Phase II of this measure would begin. Phase II involves the Council's review and evaluation of the results from the river herring bycatch avoidance project, and a public meeting to consider a framework adjustment to the Herring FMP to establish river herring bycatch avoidance measures. Measures that may be considered as part of the framework adjustment include: (1) Adjustments to the River Herring Monitoring/Avoidance Areas; (2) mechanisms to tracking herring fleet activity, report bycatch events, and notify the herring fleet of encounters with river herring; (3) the utility of test tows to determine the extent of river herring bycatch in a particular area; (4) the threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of the Area; and (5) the distance and/or time that vessels would be required to move from the Areas.

River Herring Catch Caps

Amendment 5 establishes the ability to consider implementing a river herring catch cap for the herring fishery in a future framework adjustment to the Herring FMP. Amendment 1 to the Herring FMP identified catch caps as management measures that could be implemented via a framework or the specifications process, with a focus on a haddock catch cap for the herring fishery. Amendment 5 contains a specific alternative that considers implementing a river herring catch cap through a framework or the specifications process. On the basis of the explicit consideration of a river herring catch cap, and the accompanying analysis, in Amendment 5, NMFS has advised the Council that it would be more appropriate to consider a river herring catch cap in a framework subsequent to the implementation of Amendment 5.

Amendment 5 contains some preliminary analysis of a river herring catch cap, but additional development of a range of alternatives (e.g., amount of cap, seasonality of cap, consequences of harvesting cap) and the environmental impacts (e.g., biological, economic) of a river herring catch cap would be necessary prior to implementation. Therefore, it is more appropriate to consider implementing a river herring catch cap through a framework, rather than through the

specifications. The Council may begin development of the river herring catch cap framework immediately, but the framework cannot be implemented prior to the approval and implementation of Amendment 5.

During the development of Amendment 5, the ASMFC began work on a new stock assessment for river herring. It was hoped that the new assessment would help inform the analysis to determine a reasonable range of alternatives for a river herring catch cap. The ASMFC's river herring assessment was completed in May 2012, and the Council took final action on Amendment 5 in June of 2012. Therefore, there was not enough time to review the assessment, and if appropriate, incorporate its results in the development of a river herring catch cap in Amendment 5. At its November 2012 meeting, the Council approved a river herring catch cap framework (Framework 3 to the Herring FMP) as a priority for 2013.

In Framework 3, the Council would need to consider whether a river herring catch cap would provide sufficient incentive for the industry to avoid river herring and help to minimize encounters with river herring along with weighing the practicability of the proposed measures. Based on the ASMFC's recent river herring assessment, data do not appear to be robust enough to determine a biologically-based river herring catch cap and/or the potential effects on river herring populations of such a catch cap on a coast-wide scale. Still, the Council supports establishing the ability to consider a river herring catch cap and considering approaches for setting a river herring catch cap in the herring fishery as soon as possible.

The Mid-Atlantic Fishery Management Council is also considering establishing a river herring catch cap for its mackerel fishery. Due to the mixed nature of the herring and mackerel fisheries, especially during January through April, the potential for the greatest river herring catch reduction would come from the implementation of a joint river herring catch cap for both the herring and mackerel fisheries. On May 23, 2013, the New England and the Mid-Atlantic Councils' technical teams for the herring and mackerel fisheries met to begin development of river herring catch caps. Additionally, the New England Council currently plans to review Framework 3 at its upcoming September 2013 meeting.

One of the primary purposes of Amendment 5 is to address bycatch issues through responsible management, consistent with the MSA National Standard 9 requirement to minimize bycatch and mortality of unavoidable bycatch to the extent practicable. Monitoring and avoidance are critical steps to a better understanding of the nature and extent of bycatch in this fishery in order to sufficiently analyze and, if necessary, address bycatch issues. Amendment 5 considered other measures to address river herring bycatch in Amendment 5, including closed areas. Because the seasonal and inter-annual distribution of river herring is highly variable in time and space, both the Council and NMFS determined that the most effective measures in Amendment 5 to address river herring bycatch and bycatch mortality would be those that increase catch monitoring, bycatch accounting, promote cooperative efforts with the industry, and reduce economic impacts to minimize bycatch and bycatch mortality to the extent practicable.

4. Measures to Address Midwater Trawl Access to Groundfish Closed Areas

Amendment 5 expands the existing requirements for midwater trawl vessels fishing in Groundfish Closed Area I to all herring vessels fishing with midwater trawl gear in the groundfish closed areas. These closed areas include: Closed Area I, Closed Area II, Nantucket Lightship Closed Area, Cashes Ledge Closure Area, and Western Gulf of Maine Closure Area. The coordinates for these areas are defined at 50 CFR § 648.81(a)-(e).

Amendment 5 requires vessels with a herring permit fishing with midwater trawl gear in the groundfish closed areas to carry a NMFS-approved observer, prohibits slippage, and complete a released catch affidavit for slippage events. Herring vessels not carrying a NMFS-approved observer may not fish for, possess, or land fish in or from the closed areas. Vessels may make test tows without pumping catch on board, provided that all catch from test tows is available to the observer when the next tow is brought aboard. Amendment 5 would allow catch to be released before it was pumped aboard the vessel if: (1) Pumping the catch aboard could compromise the safety of the vessel, (2) mechanical failure prevents the catch from being pumped aboard, or (3) spiny dogfish have clogged the pump and prevent the catch from being pumped aboard. But if catch is released for any of the reasons stated above, the vessel operator would be required to immediately exit the closed area. The vessel may continue to fish, but it may not fish in any closed area for the remainder of that trip. Additionally, vessels that release catch before it has been sampled by an observer must complete a released catch affidavit within 48 hr of the end of the fishing trip. The released catch affidavit would detail: (1) Why catch was released; (2) an estimate of the weight of fish caught and released; and (3) the time and location of the released catch.

As described previously, given NEFOP's recent training changes and its addition of a discard log, NMFS believes that observer data on slipped catch rather than released catch affidavits provide the best information to account for discards. However, there is still a compliance benefit to requiring a released catch affidavit because it would provide enforcement with a sworn statement regarding the operator's decisions and may help to understand why slippage occurs.

The approved measure to address midwater trawl access to groundfish closed areas is similar to the disapproved slippage caps; however, there are important differences between these measures. If midwater trawl vessels release catch in the closed areas, they are allowed to continue fishing, but they may not fish in closed areas for the remainder of that trip. The proposed requirement to leave the closed areas and continue to fish is less punitive than the proposed requirement to return to port if a vessel slips catch. Therefore, if the safety of bringing catch aboard is a concern, simply leaving the closed areas but continuing to fish would likely be an easier decision for a vessel operator to make than the decision to stop fishing and return to port. Additionally, because the consequences of releasing catch apply uniformly to all midwater trawl vessels fishing in grounfish closed areas, the potential of inequality across the fleet is not an issue for this approved meassure, like it is for the disapproved slippage caps.

Analyses in the Amendment 5 FEIS suggest that midwater trawl vessels are not catching significant amounts of groundfish either inside or outside the groundfish closed areas. Additionally, the majority of groundfish catch by midwater trawl vessels is haddock, and the catch of haddock by midwater trawl vessels is already managed through a haddock catch cap for the herring fishery. However, as described previously, both the Council and NMFS believe it is

important to determine the extent and nature of bycatch in the herring fishery. This measure would still allow the herring midwater trawl fishery to operate in the closed areas, but it would ensure that opportunities for monitoring and sampling were maximized.

5. Adjustments to List of Measures Modified Through Framework Adjustments or Specifications

Amendment 5 specifies the ability to modify management measures revised or established by Amendment 5 through a framework adjustment to the Herring FMP or the specifications process.

Therefore, the measures that could be modified through a framework include: (1) Changes to vessel trip notification and declaration requirements; (2) adjustments to measures to address net slippage; (3) adjustments to requirements for observer coverage levels; (4) River Herring Monitoring/Avoidance Areas; (5) provisions for the river herring bycatch avoidance program; (6) changes to criteria/provisions for access to the groundfish closed areas; and (7) river herring catch caps.

The list of measures that could be modified through the specifications process would include: (1) Possession limits; (2) River Herring Monitoring/Avoidance Areas; and (3) river herring catch caps.

As required, NMFS evaluated Amendment 5 relative to the National Standards described in section 301 of the MSA, and found the action to be consistent with these standards. A summary of the rationale for the determination of compliance is in Section 7.1 of the FEIS. NMFS's disapproval of measures considered in that rationale does not change it conclusion. As noted in the discussions above, the disapproved measures were the Council's attempts to improve monitoring and catch data for the herring fishery while mitigating the economic costs of those measures. The measures were disapproved, however, because they did not comply with the law and, thus, were impracticable. The existing SBRM observer coverage levels and prohibition on slippage minimize bycatch and bycatch mortality to the extent practicable, especially in combination with the suite of approved measures in Amendment 5.

Environmentally Preferred Alternative

As required by the Council on Environmental Quality (CEQ)'s NEPA regulations, NMFS shall identify the "alternative or alternatives which were considered to be environmentally preferable (40 CFR Part 15.05.2(b))." The environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment, and that best protects, preserves and enhances historic, cultural and natural resources.

The Amendment 5 FEIS evaluates the biological impacts of the proposed measures and other non-selected options considered on the herring resource, non-target and other fisheries, the physical environment and essential fish habitat (EFH), and protected resources (i.e., marine mammals and endangered species). Where sufficient information was available, the proposed measures and other options were compared using quantitative criteria. Many of the proposed measures interact with each other, and analyzing the measures individually does not capture the

true impact of adopting a suite of measures. For example, the proposed measures to revise regulatory definitions, create new herring permits, and expand trip notification requirements both individually and collectively have biological and economic impacts. Additionally, it is not always possible to quantify the impacts of certain measures, such as measures to address river herring interactions and measures to address midwater trawl access to groundfish closed areas, when there is limited quantitative information regarding the possible impacts of the measures. As a result, most proposed measures and options were analyzed through both quantitative and qualitative analysis, as appropriate. See Section 6 of the FEIS for a complete analysis of the biological impacts of the proposed measures and other non-selected options.

1. Impacts on the Herring Resource

The herring fishery is managed through an ACL and sub-ACLs for herring management areas that are designed to prevent overfishing on individual stock components. The herring resource is not overfished, and overfishing is not occurring. Due to the ongoing management of the herring fishery through ACLs/sub-ACLs, selection of the proposed measures versus other non-selected options considered in Amendment 5 are not likely to directly impact the health of the herring resource in the short-term. However, some of the indirect, long-term benefits likely to result from the proposed measures under consideration in Amendment 5 would not be realized if no action is taken.

The long-term benefits to the herring resource from the proposed measures are relatively indirect, but are based on improved catch monitoring. The proposed measures to increase observer coverage, improve at-sea sampling conditions, and prohibit slippage may lead to better catch data for herring stock assessments. While the proposed measures to adjust the fishery management program (regulatory definitions, administrative provisions, modifications to provisions for carrier vessels, increased trip notification requirements, open access permit provisions) are not likely to directly impact the health of the herring resource in the short-term, there may be some indirect, long-term benefits to herring through improved catch reporting. Improved catch reporting and catch data could lead to better information for stock assessments and, ultimately, more effective long-term management of the herring resource.

2. Impacts on Non-Target Species and Other Fisheries

In the Amendment 5 FEIS, non-target species refers to species other than herring that are caught and landed with herring and other fisheries refers to those fisheries directly affected by or related to the operation of the herring fishery, such as Atlantic mackerel (mackerel), groundfish, and river herring (in state waters). When river herring (alewife and blueback herring) are encountered in the herring fishery, they are either discarded at sea (bycatch) or, because they closely resemble herring, they are retained and sold as part of the herring catch (incidental catch). Because of these interactions, for the purposes of Amendment 5, the terms bycatch and incidental catch are used interchangeably.

The proposed measures to increase observer coverage, improve at-sea sampling conditions, and prohibit slippage may lead to better catch data on non-target species. Additionally, the proposed measures to adjust the fishery management program (regulatory definitions, administrative

provisions, modifications to provisions for carrier vessels, increased trip notification requirements, open access permit provisions) may also lead to better catch data on non-target species through improved catch reporting.

Data on the bycatch of river herring in the herring fishery is limited and highly variable. The proposed measures to establish River Herring Monitoring/Avoidance Areas and evaluate the existing, voluntary river herring bycatch avoidance program are likely to generate valuable information on the frequency, magnitude, and nature of river herring encounters in the herring fishery. The Council did not adopt the option to establish River Herring Protection Areas and prohibit fishing in those areas. While closing River Herring Protection Areas to fishing may reduce the bycatch of river herring in the short-term, available data is insufficient to determine if the potential benefit of the reduction in bycatch would outweigh the potential reduction in herring catch and industry income. A better understanding of the nature of river herring bycatch in the herring fishery will assist with weighing these factors in order to minimize river herring bycatch to the extent practicable. Additionally, the proposed measure to consider establishing a river herring catch cap in a future action is expected to complement the existing, voluntary river herring bycatch avoidance program and may be an effective tool to minimize river herring catch in the herring fishery. Measures proposed in Amendment 5 to address river herring are not specifically designed to address the catch of shad (American and hickory) in the herring fishery; however, measures to reduce the bycatch of river herring are expected to reduce the bycatch of shad because of the overlap in distribution between river herring and shad.

Analyses in the Amendment 5 FEIS suggest that midwater trawl vessels are not catching significant amounts of groundfish either inside or outside the groundfish closed areas. However, the proposed measures for increased monitoring of midwater trawl vessels fishing in the groundfish closed areas are likely to generate valuable information on the frequency, magnitude, and nature of groundfish encounters in the herring fishery. The Council did not adopt the option to prohibit midwater trawl gear in groundfish closed areas. While closing groundfish closed areas to midwater trawling may reduce the bycatch of groundfish in the short-term, available data is insufficient to determine if the potential benefit of the reduction in bycatch would outweigh the potential reduction in herring catch and industry income. A better understanding of the nature of groundfish bycatch in the herring fishery will assist with weighing these factors in order to minimize groundfish bycatch to the extent practicable.

3. Impacts on the Physical Environment and EFH

Because Amendment 5 is focused on improving monitoring and addressing bycatch, none of the proposed measures or other non-selected options are expected to greatly affect the amount or location of herring fishing effort. The proposed measure to increase the open access herring permit possession limit for Herring Management Areas 2 and 3 may slightly increase effort in those areas, but the increase is not likely to be substantial. The non-selected options to establish River Herring Protection Areas and prohibit midwater trawl gear in groundfish closed areas may have slightly reduced the amount of fishing effort in those areas. However, gear impacts of the herring fishery on the ocean floor from midwater trawl gear have been determined to be minimal and temporary and impacts from bottom trawl gear has been minimized by the establishment of

habitat closed areas. Therefore, none of the proposed measures or other non-selected options in Amendment 5 are expected to have direct impacts on either the physical environment or EFH.

4. Impacts on Protected Resources

Because Amendment 5 is focused on improving monitoring and addressing bycatch, none of the proposed measures or other non-selected options are expected to greatly affect the amount or location of herring fishing effort. The proposed measures to increase observer coverage, improve at-sea sampling conditions, and prohibit slippage may lead to better catch data on protected species. The proposed measure to increase the open access herring permit possession limit for Herring Management Areas 2 and 3 may slightly increase effort in those areas, but the increased is not likely to be substantial. The non-selected options to establish River Herring Protection Areas and prohibit midwater trawl gear in groundfish closed areas may have slightly reduced the amount of fishing effort in those areas. However, interactions between protected species and the herring fishery are dynamic, and it is difficult to predict whether or not reducing fishing effort in those areas would minimize interactions. Therefore, none of the proposed measures or other non-selected options in Amendment 5 are expected to have direct impacts on protected species.

For the reasons described above, NMFS has determined that, overall, the measures adopted by the Council and approved by NMFS represent the environmentally preferred alternative.

Mitigation

CEQ NEPA regulations require that agencies identify in the ROD whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why. The regulations further state that a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation. Mitigation measures are the practical means to avoid, minimize, and reduce impacts, and to compensate for unavoidable impacts.

No significant environmental harm is expected to result from the implementation of Amendment 5 relative to the continuation of no action alternatives or non-selected alternatives considered in Amendment 5. Therefore, specific management measures to mitigate environmental impacts are not necessary.

Response to Comments

An NOA for the FEIS was prepared for Amendment 5 published on April 26, 2013, (78 FR 24743) with a comment period ending May 28, 2013. NMFS received one comment letter from the Environmental Protection Agency (EPA) during the FEIS NOA comment period.

In addition, an NOA for Amendment 5 published on April 22, 2013, (78 FR 23733) with a comment period ending June 21, 2013, and proposed rule was published on June 3, 2013, (78 FR 33020) with a comment period ending July 18, 2013. NMFS received three comment letters on

the EIS for Amendment 5 from environmental advocacy groups during the NOA comment period on the amendment ending June 21, 2013.

The following is a summary of those comments followed by NMFS's responses:

Comment 1: The EPA commented that, based on its review of the FEIS, it has no objections to Amendment 5.

Response: NMFS concurs.

Comment 2: Pew Charitable Trusts and the Herring Alliance commented that NMFS should modify the list of items that could be developed through a framework or specifications package to exclude observer coverage levels, stating that modifying observer coverage levels through a framework or the specifications was not contemplated in the draft EIS for Amendment 5.

Response 2: NMFS believes the draft EIS does contemplate modifying observer coverage levels through a framework action. In Section 3.5 of the draft EIS for Amendment 5, it explains that if any new management measures are adopted in Amendment 5, changes to those measures and related adjustments would be added to the list of measures that can be implemented through a framework adjustment to the Herring FMP in the future. Additionally, during the comment period on the draft EIS, the document explains that the public should consider whether or not any of the new measures proposed in this amendment should be modified in the future through a framework adjustment and states that for the FEIS, the list of measures will be based on the management measures adopted by the Council.

As part of Amendment 5, the Council adopted two measures specifying observer coverage levels, the 100-percent observer coverage requirement for Category A and B vessels and the 100-percent observer coverage requirement for midwater trawl vessels fishing in the groundfish closed areas. Because the Council adopted observer coverage levels as part of Amendment 5, observer coverage level was added to the list of measures that could be modified through a framework in the FEIS. While NMFS is disapproving the 100-percent observer coverage requirement for Category A and B vessels, it is approving the 100-percent observer coverage requirement for midwater trawl vessels fishing in the groundfish closed areas. Therefore, NMFS believes it is appropriate to include observer coverage levels in the list of measures that can be modified through a framework action.

Comment 3: Three commenters (Wild Oceans, Pew, Herring Alliance) stated that sufficient justification is not presented in the FEIS to indicate that establishing a new open access herring permit with a 20,000-lb herring possession limit for limited access mackerel vessels fishing in Herring Management Areas 2 and 3 is necessary. They believe this permit will increase effort in the fishery, outside the scope of new monitoring measures, and will increase directed herring fishing during times and areas where the incidental catch of river herring and shad are of great concern.

Response: NMFS believes the FEIS does provide sufficient justification for establishing the new Areas 2/3 Open Access Herring Permit. Section 6.1.5 of the FEIS describes the significant

overlap between the mackerel and herring fisheries. Mackerel and herring co-occur, particularly during January through April, which is a time that vessels often participate in both fisheries. Not all vessels participating in the mackerel fishery qualify for a limited access herring permit because they either did not have adequate herring landings or they are new participants in the mackerel fishery.

Currently, vessels issued an open access herring permit and participating in the mackerel fishery are required to discard any herring in excess of the open access permit's 6,600-lb possession limit. The FEIS suggests that herring discards in the mackerel fishery are currently low and state that the extent to which discarding may be minimized by increasing the possession limit to 20,000 lb is unclear. However, VTR data may not be well suited to reflect a discard problem at this time, and may not fully characterize the potential for this problem to exist in the future. Additionally, the industry has stated that it has not been fishing for mackerel as much in recent years because mackerel are less available to the fishery now, as they may have shifted to offshore areas, and due to concerns about encountering herring in quantities larger than the current open access herring permit possession limit.

Therefore, the creation of the new Areas 2/3 Open Access Herring Permit is intended to minimize the potential for regulatory discarding of herring by limited access mackerel vessels that did not qualify for a limited access herring permit, especially if effort in the mackerel fishery should approach historical levels, consistent with MSA National Standard 9's requirement to minimize bycatch to the extent practicable. All herring catch and discards is tracked against herring ACL/sub-ACLs, so the biological impact of the new permit on herring is expected to be neutral.

Ongoing observer coverage in the herring fishery, in combination with measure in Amendment 5 prohibiting slippage, should improve observer data on bycatch and incidental catch in the herring fishery. Possession limits are a measure that can be modified through a framework or the specifications. If the catch of river herring and shad is determined to be too high, the 20,000-lb possession limit could be modified in a future action.

Comment 4: NMFS received numerous comments from environmental advocacy groups that the analysis in the FEIS does provide a reasonable basis for capping slippage events at 10 slippage events by gear (midwater trawl, bottom trawl, purse seine) and by herring management area.

Response: NMFS believes the FEIS demonstrates that frequency of slippage in the herring fishery is highly variable. During 2008-2011, the number of slippage events per year ranged between 35 and 166. The annual average number of slippage events by gear type during 2008, 2009, and 2011 are as follows: 4 by bottom trawl; 36 by purse seine; and 34 by midwater trawl. Because the frequency of slippage was not consistently analyzed in the FEIS by gear type and management area, NMFS believes it difficult to use the analysis in the FEIS to select a value for slippage caps by gear type and management area. For example, based on the available data for past years, the proposed slippage cap would not have affected bottom trawl vessels. On the other hand, it might have affected vessels using purse seine and midwater gear if slippage events were concentrated in one or two management areas. For these reasons, NMFS believes the FEIS does not provide a strong operational basis for a slippage cap value.

Comment 5: Earth Justice commented that Amendment 5 fails to consider cumulative impacts of ongoing Federal actions, including a future amendment to the Herring FMP to consider listing river herring and shad as stocks in the fishery, Framework 48 to the Northeast Multispecies FMP, and Omnibus EFH Amendment, and fails to analyze the impacts of an industry-funded observer program.

Response: NMFS disagrees. Section 6.6.4 of the FEIS describes the impacts of cumulative effects. That section describes the future amendment to the Herring FMP to consider listing river herring and shad as stocks in the fishery and the Omnibus EFH Amendment and discusses their potential under reasonably foreseeable future actions. Because those actions are still being developed, it is not possible to definitively analyze the impacts of those actions until the range of alternatives for those amendments has been finalized. Frameworks 48 and 50 to the Multispecies FMP revised management of the groundfish fishery. While groundfish regulations may affect the herring fishery, not including Frameworks 48 (revised groundfish sector management) or 50 (revised groundfish harvest specifications) in the cumulative effects section of the FEIS does not invalidate the entire cumulative effects analysis because those actions have minimal impact on management of the herring fishery. Framework 48 revises the possible list of exemptions for groundfish sectors, including access to groundfish closed areas, but a future action, would be required to consider allowing sectors access to groundfish closed areas. Additionally, Framework 50 reduces the amounts of the haddock catch caps for the herring fishery, but that reduction is not expected to significantly affect the herring fishery because it is minimal.

Section 6.2 of the FEIS analyzes the impacts of an industry-funded observer program on herring, non-target species and other fisheries, the physical environment and EFH, and fishery-related businesses and communities. This analysis focuses on the biological impacts of a range of observer coverage levels, the economic impacts of the industry paying a range of costs, and the biological and economic impacts of observer service provider requirements.

Summary

After careful review of the proposed measures, the associated analyses, and public comment, NMFS is partially approving Amendment 5 to the Herring FMP, as described above. This action is intended to improve the catch monitoring program for the herring fishery and address bycatch issues through responsible management. NMFS has determined that the measures being approved represent the environmentally preferable alternative when considering the balance of environmental and economic effects that might accrue from these measures within the context and strictures of the MSA and other applicable law. In addition, NMFS has determined the approved measures will promote the national environmental policy as discussed in Section 101 of NEPA. NMFS also concludes that all practical and legally justifiable means to avoid, minimize, or compensate for environmental harm from the final action have been adopted.

The Council and NMFS have considered all applicable public comments received on Amendment 5. Responses to all comments on the Amendment 5 DEIS are available in Appendix IX of the FEIS, with comments received on the Amendment 5 FEIS listed in this ROD.

Further information concerning this Record of Decision may be obtained by contacting George H. Darcy, NMFS Northeast Region, 55 Great Republic Drive, Gloucester, MA 01930, (978) 281-9331.

Samuel D. Rauch III
Deputy Assistant Administrator for Regulatory Programs,
performing the functions and duties of the
Assistant Administrator for Fisheries

7/18/13
Date