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

AUG - 5 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 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) RIN 0648-AY26.

This FEIS is prepared pursuant to NEPA to assess the environmental impacts associated with NOAA proceeding with Amendment 14. The purposes of Amendment 14 to the MSB FMP are to: Implement an effective program for monitoring river herring and shad, and incidental catch and bycatch of these species in the MSB fisheries; and reduce the incidental catch and bycatch of river herring and shad in the MSB fisheries.

If implemented, the measures in Amendment 14 would:

- Require weekly vessel trip reports (VTRs) for all MSB permits;
- Require pre-trip and pre-landing requirements for vessels to possess or land more than 20,000 lb of Atlantic mackerel (mackerel);
- Require the use of vessel monitoring systems (VMS), as well as the submission of daily VMS catch reports, for limited access mackerel and longfin squid/butterfish moratorium permits;
- Revise reporting requirements for federally permitted dealers;
- Recommend increases to observer coverage for limited access mackerel vessel, with industry contribution to funding;
- Implement management measures to improve/maximize at-sea sampling;
- Implement measures to address net-slippage (i.e., dumping of catch at sea before it is sampled by observers);
- Support a river herring bycatch avoidance program developed in cooperation with the fishing industry;
- Establish a river herring and shad catch cap in the mackerel fishery.

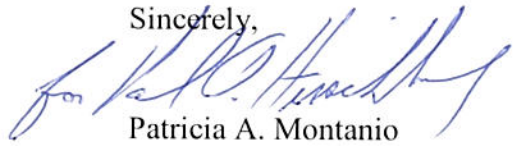
Additional copies of the FEIS may be obtained from the Responsible Program Official identified below. The document is also accessible electronically through NOAA's National Marine Fisheries Service's Northeast Regional Office website at http://www.nero.noaa.gov/nero/.

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.

Responsible Program Official:

John K. Bullard
Regional Administrator
Northeast Region
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930-2298
Phone: 978-281-9250
Fax: 978-281-9135
MSBAmendment14@noaa.gov

Sincerely,

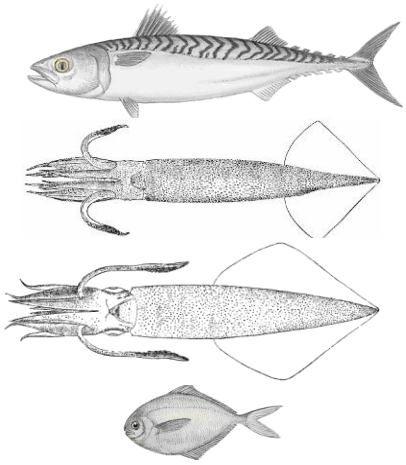


Patricia A. Montanio
NOAA NEPA Coordinator

Enclosure

AMENDMENT 14 TO THE ATLANTIC MACKEREL, SQUID, AND BUTTERFISH (MSB) FISHERY MANAGEMENT PLAN (FMP)

Final Environmental Impact Statement



----------August 2013 ----------

Mid Atlantic Fishery Management Council (MAFMC) in cooperation with the National Marine Fisheries Service (NMFS or "NOAA Fisheries")

CONTACT: Jason Didden, (302) 526-5254
MAFMC, Room 2115, Federal Building, 300 South New Street, Dover, DE 19904-6790

Abstract: Amendment 14 considers alternatives that would improve monitoring of the fisheries managed under the Atlantic mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) and alternatives to reduce catch of river herring (alewife and blueback herring) and shad (American shad and hickory shad) in these fisheries. This document provides decision-makers and the public with an evaluation of the environmental, social, and economic effects of changes to the MSB FMP pursuant to meet these goals, and addresses the requirements of the National Environmental Policy Act and Executive Order 12866.

A Publication of the Mid-Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration (NOAA) Award NA10NMF4410009

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2.0 EXECUTIVE SUMMARY

Via this document, the Council is recommending a variety of actions to be implemented by the National Marine Fisheries Service (NMFS), as described below and labeled as "**PREFERRED**" and surrounded by an "outlining box." The actions labeled as "**PREFERRED**" were approved to be recommended by the Council to NMFS at the Council's June 2012 Council meeting. Some actions were considered but were not recommended, and those are described as well. Ultimately NMFS chooses which of the alternatives are appropriate to implement.

This Amendment deals with monitoring and/or controlling all catch of blueback herring, alewife, American shad, and hickory shad in the Atlantic mackerel and longfin squid fisheries. In this document, "river herrings" include blueback herring and alewife. "Shads" include American shad and hickory shad. These four species are described together as **"RH/S"** and the Amendment addresses three potential RH/S management problems, described below (A,B, and C).

In this document, "catch" refers to all fish caught in a fishery (whether targeted or not and whether retained or discarded). Targeted fish are those intended to be caught. Non-target species are those caught but not targeted. Bycatch usually refers to discards but is a term often used in fishery management to refer to several different things and so it is not used in this document except where unavoidable (for example a report title, quotation, etc.). Instead, fish caught and then discarded at sea are called "discards." Fish that are not targeted but are landed are called "incidentally landed catch." "Incidental permits" allow retention of relatively small amounts of fish/squid.

Considering, and if appropriate, implementing solutions to these potential problems are the purposes of this Amendment. The analytical goals described below summarize the analyses conducted to support decisions for this Amendment.

Problem A: Relatively low levels of catch monitoring have resulted in relatively high uncertainty about the catch of river herrings and shads in ocean intercept fisheries.

> **Purpose A**: "**Implement Effective RH/S Catch Monitoring**" – Purpose A is to consider alternatives that would implement monitoring programs for the Mackerel, Squid, and Butterfish (MSB) fisheries that are sensitive enough and robust enough to the spatial and temporal variability of RH/S distributions so that good RH/S catch estimates from MSB fishing can be generated. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires Councils "to specify the pertinent data which shall be submitted to the Secretary with respect to…fishing…in the fishery" (Section 303(a)(5)) and Section 8 under discretionary fishery management plan provisions allows implementation of observer requirements. Additional monitoring has to fit into an existing monitoring framework and be appropriate for the species and the fishery in order to develop good RH/S estimates in the MSB fisheries, which led to the specific suite of alternatives considered in this document.

Analytical Goals: A1. "**RH/S Catch**" - Establish the best available information on the catch of RH/S in the MSB and/or other fisheries.

A2. **"Effectiveness"** - Evaluate how effective various alternatives would be in terms of improving the precision of RH/S catch estimates.

A3. **"Practicability"** - Evaluate the socioeconomic impacts from the alternatives and the ability of management to implement them.

Problem B: Catch of RH/S in the MSB fisheries may be negatively impacting RH/S populations. While the relative contribution from various causes is unknown (habitat, fishing, predation, etc.), most RH/S stocks are believed to be depleted, with many near historic low points according to the most recent RH/S assessments (see 6.2.5 and 6.2.6).

Purpose B: "**Reduce RH/S Catch**" – Purpose B is to consider alternatives to reduce catch of RH/S in the MSB fisheries. The MSA requires Councils to minimize discards to the extent practicable (Section 301 – National Standard 9) and provides discretionary authority to "include management measures in the plan to conserve…non-target species…considering the variety of ecological factors affecting fishery populations" (Section 303(b)(12)). Because information on how much RH/S catch might be sustainable is lacking, it is not currently possible to quantify the impact on RH/S stocks of any catch reductions that may occur but any catch reductions would be likely to have a positive impact to some degree.

Analytical Goals: B1. "**RH/S Catch**" - Evaluate if discards of river herrings and shads in the MSB fisheries has been minimized to the extent practicable (National Standard 9).

B2. **"Effectiveness"** - Evaluate how effective various alternatives would be in reducing the catch of RH/S.

B3. **"Practicability"** - Evaluate the socioeconomic impacts from the alternatives and the ability of management to implement them.

Problem C: The overall existing federal/state/regional management framework may be insufficient to adequately conserve RH/S stocks.

> **Purpose C: "Consider RH/S NS1 Stock Issues" –** Purpose C was to consider alternatives that would bring RH/S into the MSB plan as a managed stock in terms of Council management responsibilities, including annual catch limits and accountability measures, in order to improve overall RH/S management and conservation. The Council chose no action for that entire alternative set, and initiated Amendment 15 to consider the issue. Accordingly, the stock in the fishery issue has been moved into the "considered but rejected" section (2.4) and is summarized there. Amendment 15 will allow the Council to fully evaluate the merits of potentially adding RH/S as stocks and fisheries directly managed by the Council.

Alternatives

In this document, each purpose will be referenced by the bolded phrases in quotes above. Each purpose is addressed by one or more related set of alternatives, organized below by each purpose, summarized later in this executive summary, and fully described and analyzed in this document. Throughout this document the reader will note that the focus of the alternatives is on the Atlantic mackerel and longfin squid fisheries. This is intentional because those are the MSB fisheries that appear to have substantial RH/S interactions. The specific alternatives that have been recommended by the Council to NMFS for implementation are marked later in the Executive Summary as "**PREFERRED**" and have boxes around them.

Alternatives Related to Purpose A: Implement Effective RH/S Catch Monitoring

> **Alternative Set 1: Additional Vessel Reporting Measures**
>
> **Alternative Set 2: Additional Dealer Reporting Measures**
>
> **Alternative Set 3: Additional At-Sea Observation Optimization Measures**
>
> **Alternative Set 4: Port-side and Other Sampling/Monitoring Measures**
>
> **Alternative Set 5: At-Sea Observer Coverage Requirements**

Alternatives Related to Purpose B: Reduce RH/S Catch

> **Alternative Set 6 : Mortality Caps**
>
> **Alternative Set 7 : Restrictions in areas of high RH/S catch**
>
> **Alternative Set 8 : Hotspot Restrictions**

An extremely abbreviated summary of the preferred alternatives to preview section 2.1 ("Summary of the Alternatives and their Impacts") is:

The preferred alternatives would: require weekly VTR reporting for all MSB vessel permits (1c); require a 48-hour pre directed mackerel trip notification (1d48); require VMS and daily VMS catch reporting for mackerel and longfin squid vessels (1eMack, 1eLong, 1fMack, and 1fLong); and require a 6-hour pre-landing notification via VMS for mackerel landings greater than 20,000 pounds (1gMack). The preferred alternatives would also require federal MSB dealers to weigh all landings of mackerel over 20,000 pounds (2d) and longfin squid over 2,500 pounds (2f) or document why they cannot weight landings (2g). (If all fish are not weighed separately, dealers would have to document with each transaction how they estimate the relative composition of mixed catches.). The preferred alternatives would also require for mackerel and longfin-butterfish permits that: reasonable assistance be provided to observers (3b); notice of haul-back or pumping be provided to observers (3c); one observer is provided for each vessel on pair-trawl operations whenever possible (3d). Unless safety, mechanical, or spiny dogfish issues make it inappropriate, the same vessels would not be able to release hauls of fish ("slippage") prior to observer documentation, and catch affidavits would have to be completed for any pre-observed net release (3j). For mackerel limited access vessels, there would also be a fleet-wide cap of 10 non-emergency (safety, mechanical, spiny dogfish) slippages after which further non-emergency slippages would require a vessel to terminate their trip (3l). The Council also made implementation of additional portside monitoring and catch avoidance based on portside monitoring frameworkable (4f). The Council recommended 100% observer coverage of mid-water trawl (MWT) mackerel trips (5b4) as well as tiered coverage levels for small mesh bottom trawl mackerel trips (100% for Tier 1, 50% for Tier 2, and 25% for Tier 3) (5c4) along with requiring mackerel vessels to pay $325 when they carry observers to help fund the desired coverage levels (5f). Coverage levels would be re-evaluated after 2 years (5h). Since RH/S catch is greatest in the mackerel fishery, and current analysis suggested that area-based could not be determined to be an effective measure, the Council recommended mortality caps for RH/S on the mackerel fishery (6b and 6c) and added future mortality caps and hotspot closures as frameworkable actions (6f and 8b respectively).

Approximate Timeline

June 1, 2013 – Proposed Rule and FEIS made available for public comment

Aug 1, 2013 – Comment Period Closes

Dec 1, 2013 – Final Rule Publishes

Jan 1, 2014 – Rule Effective

Wording Conventions

All acronyms and abbreviations used in this document should be listed in **Section 2.0, List of Acronyms and abbreviations**. Several critical wording conventions are noted below.

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in United States federal waters. The Act was first enacted in 1976 and amended in 1996 and in 2007. In this document, the abbreviation "MSA" refers to the Magnuson-Stevens Fishery Conservation and Management Act as currently amended.

"Mackerel" refers to "Atlantic mackerel." "Am14" refers to "Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP)." "The Council" refers to "the Mid-Atlantic Fishery Management Council." "River herrings" include blueback herring and alewife. "Shads" include American shad and hickory shad. These four species are described together as **"RH/S."**

In this document, "catch" refers to all fish caught in a fishery (whether targeted or not and whether retained or discarded). Targeted fish are those intended to be caught. Non-target species are those caught but not targeted. Bycatch usually refers to discards but is a term often used in fishery management to refer to several different things and so is not used in this document except where unavoidable (for example a report title, quotation, etc.). Instead, fish caught and then discarded at sea are called "discards." Fish that are not targeted but are landed are called "incidentally landed catch." "Incidental permits" allow retention of relatively small amounts of fish/squid.
Longfin squid have previously been referenced as *Loligo pealeii* or just *Loligo*. There has been a scientific name change for this species from *Loligo pealeii* to *Doryteuthis (Amerigo) pealeii*. To avoid confusion, this document will utilize the common name "longfin squid" wherever possible. Some historical documents will still refer to these squid as "*Loligo*." All of these names reference the same species, it is just a name change due to improved understanding about the taxonomy (how species are grouped on the basis of shared characteristics) of the species.

The term "mortality cap" refers to a management system whereby directed fishing for one species may be stopped or limited when catch of some other species reaches a pre-set limit. Similar terms include bycatch caps or discard caps.

2.1 SUMMARY OF THE ALTERNATIVES AND THEIR IMPACTS

The alternatives in this document are primarily designed to: 1) consider improving monitoring and observing of river herring and shad (RH/S) catch and 2) consider ways to reduce RH/S catch in the Atlantic mackerel, squid, and butterfish (MSB) fisheries. While there are some potential impacts related to the managed species, habitat, and protected resources, those effects are secondary to the primary goals of Amendment 14. Given the impacts to the managed species, habitat, and protected resources are generally low, indirect, and positive, the textual summary in this Executive Summary focuses on impacts related to non-target species, especially river herrings and shads, and the related fishery business and human community impacts (Socio-Economic impacts). Managed species, habitat, and protected resource impacts are described in Section 7 and summarized in Table 8 later in this Executive Summary. Some alternatives with very similar impacts are grouped together.

In the DEIS, Alternative Set 9 considered whether to add RH/S as stocks in the fishery. Since the Council chose no action for that entire alternative set, and also has begun Amendment 15 to more fully consider the issue, the stock in the fishery issue has been moved into the "considered but rejected" section (2.4) and is summarized there.

Some alternatives have been modified compared to the DEIS. Those modifications are highlighted with double underlines in the Executive Summary and Alternatives Section. An explanation for the modification is included, and the modifications do not create novel alternatives that extend beyond the range, impacts, or intent of alternatives analyzed in the DEIS.

There are about 80 alternatives in this document. This means that there are millions of different possible combinations. At the beginning of each Alternative Set, it is noted which alternatives may, and which alternatives may not be, grouped together within the Alternative Set. Between Alternative Sets, alternatives generally may be combined without problem. The only broad exception to this rule is that it would be unlikely that alternatives from both of the area-based alternatives (Sets 7 and 8) would be chosen together.

To the extent that alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other species, then choosing such alternatives might result in long term additional benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). However, due to the uncertainty about how the productivity of RH/S is impacted by current catch levels, it is difficult to quantity such benefits. The amount of benefit to RH/S stocks from any action affecting the MSB fisheries is unknown, so even though one might contemplate what the value of rebuilt RH/S fisheries might be, it is not possible to know if an action in this document might lead rebuilt RH/S fisheries because of the range of issues likely affecting RH/S stocks. One would expect that higher related benefits would result from actions that were more likely to restore RH/S populations. This theme is repeated as appropriate in the Impacts Section (Section 7) and in the rest of this Executive Summary the following sentence is used to reiterate the ideas described in this paragraph rather than repeating the paragraph many

times: "While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1."

The reader will note that more alternatives were selected for the mackerel fishery relative to the longfin squid fishery. This is because, as described in the affected environment section, there appear to be substantially more catches of RH/S in the mackerel fishery compared to the longfin squid fishery.

2.1.1 Alternative Set 1: Additional Vessel Reporting Measures

Background/Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements may be insufficient to estimate RH/S catch in the mackerel and longfin squid fisheries precisely enough to facilitate effective management goals (such as reducing catch).

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase vessel reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates in the MSB fisheries. While some of the focus may appear to be on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries, because extrapolations of non-target species are often made based on total landings (including the target species), accurate monitoring of the target species are important for determining encounter rates and total interactions with RH/S. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

NOTE ON COMBINATIONS: Most of the Alternative Set 1 action alternatives could be implemented individually or collectively. However, 1c (weekly VTRs for all MSB permits) would encompass 1bMack and 1bLong so these would not be selected together. The 48-hr mackerel pre-trip notification (1d48) and 72-hr mackerel pre-trip notification (1d72) would also be mutually exclusive – only one would be chosen if either. The VMS reporting alternatives (1f's and 1g's) would need the respective 1e's (that require VMS) for each fishery as a prerequisite before requiring VMS reporting.

1a. No-action

If this alternative is selected, then no measures from Alternative Set 1 would be implemented and the existing reporting measures (as described in section 5.1) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

1bMack. Institute weekly vessel trip reporting (VTR) for mackerel permits.

Summary of Biological Impact Analysis

To the degree that more rapid VTR reporting could be used to cross check dealer data to ensure that fishery closures occur appropriately, there could be potentially low positive impacts. Such closures could be related to directed fishery closures or mortality cap closures for non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The number of total mackerel permits can vary from month to month. Of the 1,974 vessels that had mackerel permits in November 2011, 67 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus, about 67 vessels would ultimately be subject to additional reporting requirements because of this measure. Those 67 vessels must currently submit VTR reports monthly. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs. This would result in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permitted vessel.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1bLong. Institute weekly vessel trip reporting (VTR) for longfin squid/Butterfish permits.

Summary of Biological Impact Analysis

To the degree that more rapid VTR reporting could be used to cross check dealer data to ensure that fishery closures occur appropriately, there could be potentially low positive impacts. Such closures could be related to directed fishery closures or mortality cap closures for non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The number of incidental squid/butterfish permits can vary from month to month. Of the 1,891 vessels that had longfin squid//Butterfish Moratorium permits or squid/butterfish incidental permits in November 2011, 74 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus, about 74 vessels would ultimately be subject to additional reporting requirements because of this measure. Those 74 vessels must currently submit VTR reports monthly. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs, resulting in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permitted vessel. For informational purposes, about 9 of the 351 longfin squid//Butterfish moratorium permits do not currently have a weekly VTR reporting requirement from another permit (herring or NE multispecies).

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1c. Institute weekly vessel trip reporting (VTR) for all MSB permits (Mackerel, longfin squid//Butterfish, *Illex*) so as to facilitate quota monitoring (directed landings and/or mortality cap if applicable) and cross checking with other data sources. (PREFERRED)

Summary of Biological Impact Analysis

To the degree that more rapid VTR reporting could be used to cross check dealer data to ensure that fishery closures occur appropriately, there could be potentially low positive impacts. Such closures could be related to directed fishery closures or mortality cap closures for non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The number of total mackerel permits and the number of squid/butterfish incidental permits can vary from month to month. Of the 2,622 vessels that have MSB permits in November 2011, 121 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus about 121 vessels would ultimately be subject to additional reporting requirements because of this measure. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs, resulting in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permit holder. The 121 vessels encompass the same affected vessels from 1bMack and 1bLong above (there is also some overlap between 1bMack and 1bLong).

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1. One specific advantage of this alternative compared to 1b and 1c is that there would be uniformity of reporting in the MSB FMP and other Northeast Region fisheries.

1d48. Require 48 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement. (PREFERRED)

This would be used to facilitate observer placement. If vessels did not notify they would not be able to land more than an incidental level of fish (20,000 pounds).

Summary of Biological Impact Analysis

To the degree that better observer data leads to more effective reduction of discards, and to the degree that this alternative leads to better observer data collection, this alternative could lead to positive impacts for non-target species. If a mortality cap on RH/S is implemented, obtaining a complete list of trips to sample becomes very important to ensure that unbiased estimates can be calculated.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This is similar to an initially 72-hour but now 48-hour trip notification requirement in the longfin squid fishery that became effective in 2011 initially and became 48 hours in 2013. Fishermen have reported that the 72-hour notification sometimes means they are unable to target fleeting aggregations of longfin squid because they are not able to put to sea on short notice, especially if they are selected to take an observer.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1d72. Require 72 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement.

This would be used to facilitate observer placement. If vessels did not notify they would not be able to land more than incidental level of fish (20,000 pounds).

Summary of Biological Impact Analysis

To the degree that better observer data leads to more effective reduction of discards, and to the degree that this alternative leads to better observer data collection, this alternative could lead to positive impacts for non-target species. If a mortality cap on RH/S is implemented, obtaining a complete list of trips to sample becomes very important to ensure that unbiased estimates can be calculated.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This is similar to an initially 72-hour but now 48-hour trip notification requirement in the longfin squid fishery that became effective in 2011 initially and became 48 hours in 2013. Fishermen have reported that the 72-hour notification sometimes means they are unable to target fleeting aggregations of longfin squid because they are not able to put to sea on short notice, especially if they are selected to take an observer.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1eMack. Require VMS for limited access mackerel vessels. (PREFERRED)

Vessel Monitoring Systems are currently utilized in many New England fisheries. They are generally used to facilitate compliance and enforcement of area-based management measures as well as catch monitoring by means of a satellite connection between shore and a fixed electronic unit installed on vessels.

Summary of Biological Impact Analysis

If area-based management alternatives are eventually selected for purposes of reducing catch of RH/S, VMS can be a useful tool for compliance/enforcement of area-based management. If port-side sampling requirements are eventually selected for purposes of monitoring landings of RH/S, VMS could also be used for compliance/enforcement if catch reporting via VMS is also required (see 1fMack and 1gMack below). Having VMS is a prerequisite for VMS catch reporting as well (see related alternatives below).

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Of the approximately 2,200 vessels that had open access mackerel permits at some point in 2011, 684 were not also required to have VMS. While not all of these vessels will qualify for mackerel limited access (being implemented currently), 684 would be an upper bound on how many vessels could have to buy new VMS units. Amendment 11 estimated that around 400 vessels might qualify for limited access. If one maintains the ratio of open access boats (684/2,200 = 31%) that would need VMS for the 400 likely qualifiers for mackerel limited access, 31% of 400 equals 124 vessels that would actually need new VMS units. Since limited access qualifiers, being more active participants, may be more likely to have other permits that require VMS, the likely range is from somewhat lower than 124 up to 684. Until the final number of qualifiers is determined it is not possible to further quantify the number of vessels that may require VMS units under this provision. 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, which would add to the costs.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1eLong. Require VMS for longfin squid/butterfish moratorium vessels (see 1f and 1g below). (PREFERRED)

Vessel Monitoring Systems are currently utilized in many New England fisheries. They are generally used to facilitate compliance and enforcement of area-based management measures as well as catch monitoring by means of a satellite connection between shore and a fixed electronic unit installed on vessels.

Summary of Biological Impact Analysis

If area-based management alternatives are eventually selected for purposes of reducing catch of RH/S, VMS can be a useful tool for compliance/enforcement of area-based management. If port-side sampling requirements are eventually selected for purposes of monitoring landings of RH/S, VMS could also be used for compliance/enforcement if catch reporting via VMS is also required (see 1fLong and 1gLong below). Having VMS is a prerequisite for VMS catch reporting as well (see related alternatives below).

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Of the 351 vessels that had longfin squid//butterfish moratorium permits in 2011, 7 were not also required to have VMS because of other permits and would have to equip their vessel with VMS under this provision. 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, which would add to the costs.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1fMack. Require daily VMS reporting of catch by limited access mackerel vessels so as to facilitate monitoring (directed and/or unintentional catch) and cross checking with other data sources. Requiring VMS (see 1eMack above) and requiring trip declarations (would be a prerequisite for this alternative. (PREFERRED)

Summary of Biological Impact Analysis

If area-based management alternatives are eventually selected for purposes of reducing catch of RH/S, VMS catch reporting can be a useful tool for compliance/enforcement of area-based management. In high-volume fisheries like MSB, daily reporting of catch can also assist in the effective and timely execution of fisheries closures.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This alternative could only be selected if 1eMack was also selected. VMS costs are discussed under the 1eMack alternative. The cost of transmitting a catch report via VMS is $0.60 per transmission.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1fLong. Require daily VMS reporting of catch by longfin squid moratorium permits so as to facilitate monitoring (directed and/or unintended catch) and cross checking with other data sources. Requiring VMS (see 1eLong above) and requiring trip declarations would be a prerequisite for this alternative. (PREFERRED)

Summary of Biological Impact Analysis

If area-based management alternatives are eventually selected for purposes of reducing catch of RH/S, VMS catch reporting can be a useful tool for compliance/enforcement of area-based management. In high-volume fisheries like MSB, daily reporting of catch can also assist in the effective and timely execution of fishery closures.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This alternative could only be selected if 1eLong was also selected. VMS costs are discussed under the 1eLong alternative. The cost of transmitting a catch report via VMS is $0.60 per transmission.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1gMack. Require 6 hour pre-landing notification via VMS to land more than 20,000 pounds of mackerel, which could facilitate quota monitoring, enforcement, and/or portside monitoring. (PREFERRED)

This would be used to facilitate catch monitoring (directed or unintended catch), cross checking with other data sources, and portside monitoring (if applicable).

Summary of Biological Impact Analysis

Pre-landing notifications could facilitate enforcement of landings limits, proper landings reporting, and port-side monitoring.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This alternative could only be selected if 1eMack was also selected. VMS costs are discussed under the 1eMack alternative. The cost of transmitting a catch report via VMS is $0.60 per transmission.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

1gLong. Require 6 hour pre-landing notification via VMS to land more than 2,500 pounds of longfin squid, which could facilitate quota monitoring, enforcement, and/or portside monitoring.

This would be used to facilitate catch monitoring (directed or unintended catch), cross checking with other data sources, and portside monitoring (if applicable).

Summary of Biological Impact Analysis

Pre-landing notifications could facilitate enforcement of landings limits, proper landings reporting, and port-side monitoring.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This alternative could only be selected if 1eLong was also selected. VMS costs are discussed under the 1eLong alternative. The cost of transmitting a catch report via VMS is $0.60 per transmission.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

2.1.2 Alternative Set 2 – Additional Dealer Reporting Measures

Background/Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements may be insufficient to precisely estimate RH/S catch. Also, practices on how landing weights are determined are not standardized.

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. While some of the focus may appear to be on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries, because extrapolations are often made based on total landings, accurate monitoring of the target species can be as important as determining the encounter rates of RH/S. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

NOTE ON COMBINATIONS: Most of the Alternative Set 2 action alternatives could be implemented individually or collectively. However, 2c and 2d (weighing mackerel) would be mutually exclusive – only one would be chosen if either. Likewise, 2e and 2f (weighing longfin squid) would be mutually exclusive – only one would be chosen if either. 2g (dealers can use volume to weight conversions) would modify 2c, 2d, 2e, or 2f so 2g could only be chosen if at least one of those four alternatives was also chosen.

2a. No-action

If this alternative is selected, then no measures from Alternative Set 2 would be implemented and the existing reporting measures (as described in section 5.2) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

2b. Require federally permitted MSB dealers to obtain vessel representative confirmation of Standard Atlantic Fisheries Information System transaction records for mackerel landings over 20,000 lb, *Illex* landings over 10,000 lb, and longfin squid landings over 2,500 lb.

This would be accomplished by vessels via Fish Online, an existing internet-based program that currently allows vessels to voluntarily check their landings records. Dealers would have to confirm with vessels that a vessel representative had checked Fish Online to confirm landings.

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that quotas are not exceeded and for accurate stock assessments. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Since internet access is pervasive in the Mid-Atlantic and New England, either vessel owners or their representative should be able to make an internet-based confirmation of dealer transactions records without substantial cost. Improving records could benefit fishermen if additional qualifications are ever considered for holding MSB permits.

2c. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that directed fishery quotas are not exceeded and for accurate stock assessments. To the extent that directed landings informs mortality caps (often substantially), accurate directed landings data can be important for managing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be low. Other dealers use volume to weight conversions and could have to purchase scales. Purchasing a truck or hopper scale can range up to $100,000 per installation or $50,000 per installation respectively while smaller scales could be bought for several hundred dollars with a wide range in between. Smaller scales could slow down processing however.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

2d. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch. (PREFERRED)

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that directed fishery quotas are not exceeded and for accurate stock assessments. To the extent that directed landings informs mortality caps (often substantially), accurate directed landings data can be important for managing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be low. Other dealers use volume to weight conversions and could have to purchase scales. Purchasing a truck or hopper scale can range up to $100,000 per installation or $50,000 per installation respectively while smaller scales could be bought for several hundred dollars with a wide range in between. Smaller scales could slow down processing however.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

2e. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that directed fishery quotas are not exceeded and for accurate stock assessments. To the extent that directed landings informs mortality caps (often substantially), accurate directed landings data can be important for managing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be low. Other dealers use volume to weight conversions and could have to purchase scales. Purchasing a truck or hopper scale can range up to $100,000 per installation or $50,000 per installation respectively while smaller scales could be bought for several hundred dollars with a wide range in between. Smaller scales could slow down processing however.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

2f. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimate relative compositions of a mixed catch. (PREFERRED)

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that directed fishery quotas are not exceeded and for accurate stock assessments. To the extent that directed landings informs mortality caps (often substantially), accurate directed landings data can be important for managing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be low. Other dealers use volume to weight conversions and could have to purchase scales. Purchasing a truck or hopper scale can range up to $100,000 per installation or $50,000 per installation respectively while smaller scales could be bought for several hundred dollars with a wide range in between. Smaller scales could slow down processing however.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

2g. Related to preferred requirements to weigh all fish (2d, 2f), allow dealers to use volume to weight conversions if they cannot weigh landings – they would need to identify their conversion methods in their dealer application and explain why they cannot weigh all landings. (PREFERRED)

Summary of Biological Impact Analysis

Accurate landings data is important to ensure that directed fishery quotas are not exceeded and for accurate stock assessments. To the extent that directed landings informs mortality caps (often substantially), accurate directed landings data can be important for managing catch of non-target species including RH/S. Volume to weight conversions may not be as accurate as simple weighing and this option could essentially make 2c-2f equivalent to the status quo (except for the documentation provision) because dealers would no longer have a requirement to weigh all landings.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact. This alternative would only be selected if 2c-2f were chosen. Determining volume to weight ratios would be less expensive than purchasing scales for those dealers that would need to do this, so compared to if 2c-2f were chosen alone, impacts would be expected to be positive for those dealers. However to the extent that not getting accurate measurements interferes with sustainable management, there could be long-term negative impacts on managed and/or non-target species compared to if just 2d and 2f (the relevant preferred alternatives) were implemented.

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2.1.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures

Background/Statement of Problem/Need for Action:

The current suite of observer monitoring requirements may be insufficient to precisely estimate RH/S catch.

The measures in this Alternative Set would (alone and/or in combination with other alternatives) facilitate more accurate monitoring by observers with the overall goal of improving the precision of RH/S catch estimates. Each alternative addresses an aspect of observer coverage that potentially could be improved to ultimately lead to better RH/S estimates. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

NOTE ON COMBINATIONS: Many of the Alternative Set 3 action alternatives could be implemented individually or collectively. However, 3h (trip termination after 1 slipped haul) and 3i (trip termination after 2 slipped hauls) would be mutually exclusive – only one would be chosen if either. Likewise, 3k (fishery-wide slippage cap at 5 mackerel slippage events) and 3l (fishery-wide slippage cap at 10 mackerel slippage events) would be mutually exclusive – only one would be chosen if either. 3m (fishery-wide slippage cap at 5 longfin slippage events) and 3n (fishery-wide slippage cap at 10 longfin slippage events) are also mutually exclusive – only one would be chosen if either. 3p would replace fishery-wide slippage caps with vessel slippage caps and it would be expected that either 3p could be chosen or 3k-3n could be chosen (if any). Also, if 3j (slippage prohibition with exceptions) was chosen then 3f or 3g could not be selected (3f and 3g require all catch to be brought aboard but 3j provides some exceptions).

If alternatives 3f – 3p are selected for mackerel, they would also require the selection of Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

3a. No-action

If this alternative is selected, then no measures from Alternative Set 3 would be implemented and the existing monitoring measures (as described in section 5.3) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

3b. Require the following reasonable assistance measures: provision of a safe sampling station; help with measuring decks, codends, and holding bins; help with fish collection; and help with basket sample collection by crew on vessels with mackerel limited access and/or longfin squid/Butterfish moratorium permits. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

Summary of Biological Impact Analysis

Such assistance could help improve observer data by allowing the observer to focus on technical aspects of observing such as species identification, weighing, measuring, etc. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Most vessels do most of these things already so impacts would be low.

Summary of Socio-Economic Impact Analysis

Impacts should be negligible as most vessels provide such assistance voluntarily.

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. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

Summary of Biological Impact Analysis

Such notification could help improve observer data by making sure the observer is aware of all sampling opportunities. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Most vessels do most of these things already so impacts would be low.

Summary of Socio-Economic Impact Analysis

Impacts should be negligible as most vessels provide such assistance voluntarily.

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. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

Summary of Biological Impact Analysis

If vessels are working in pairs conducting pair trawling or other types of fishing (e.g. using purse seines or carrier vessels) where both vessels are receiving fish, having observers on both vessels ensures that all catch from the pair trawling trip is observed. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. The observer program usually does this already so impacts would be low.

Summary of Socio-Economic Impact Analysis

This is generally occurring already (pers com Amy VanAtten). To the extent that it is not, NMFS would have to spend additional funds on observers, or if industry funding is approved in this amendment pair-trawl vessels would always have to arrange for two observers.

3e. On vessels with mackerel limited access and/or longfin squid moratorium permits, require slippage reports - "Released Catch Affidavits" from captains on observed trips if they slip a haul.

Slippage is an important concept in this amendment and 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.

Summary of Biological Impact Analysis

This alternative would be used to improve the quality of data collected by observers by developing a better understanding of slippage events. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since there no direct incentive not to slip impacts should be low. If a "trip termination because of slippage" alternative was selected (see below), the slippage reports could also be used by enforcement to determine if vessels had terminated appropriately after reaching the trigger number of slippage events.

Summary of Socio-Economic Impact Analysis

Minimal impacts would be expected. Vessel captains would have to fill out a form explaining the reason for any slipped hauls.

3f. Prohibit vessels with Mackerel limited access permits that have notified for a mackerel trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Some fishing time may be lost because nets have to be fully brought aboard after each haul. Also, this alternative could create safety problems if a vessel attempts to bring aboard a catch and/or net in dangerous conditions. The observer program reports that most vessels are already doing this a majority of the time on a voluntary basis (pers com Amy VanAtten).

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3g. Prohibit vessels with longfin squid moratorium permits that have notified for a longfin squid trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Some fishing time may be lost because nets have to be fully brought aboard after each haul. Also, this alternative could create safety problems if a vessel attempts to bring aboard a catch and/or net in dangerous conditions. The observer program reports that most vessels are already doing this a majority of the time on a voluntary basis.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3h. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 1 slipped haul on an observed trip so as to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip any hauls on an observed trip so that data can be obtained on the composition of all catches. It would apply to vessels that had notified for a mackerel or longfin squid trip.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be

reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the diversity of trips types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify revenue impacts related to this alternative.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3i. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 2 slipped hauls on an observed trip so as to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip 2 hauls on an observed trip so that data can be obtained on the composition of all catches. It would apply to vessels that had notified for a mackerel or longfin squid trip.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the diversity of trips types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify revenue impacts related to this alternative. Negative socioeconomic impacts would presumably be less than with 3h where just a single slippage event causes a trip termination.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3j. With the exceptions noted below, mackerel limited access and/or longfin squid moratorium permitted vessels that have notified the observer program of their intent to land over 2,500 pounds of longfin squid or over 20,000 pounds of mackerel and have been selected to carry an observer would be required to pump/haul 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. Vessels would be prohibited from releasing fish from the net (slippage), 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.

Exceptions: 1) pumping the catch could compromise the safety of the vessel/crew
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 a net is released, including the exemptions 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. Released Catch Affidavits must be submitted within 48 hours of completion of the trip. Exemptions and provisions of this measure can be modified via the annual specifications process.

(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the exemptions and provisions of this requirement may be modified through the annual specifications process.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Vessel captains would have to fill out a form explaining the reason for any slipped hauls. Since there are no termination provisions in this particular alternative, there should be negligible impacts.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3k. Related to 3j, for mackerel limited access permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 fleet-wide for the rest of that year. The goal is to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 5 slippage events have occurred overall in a year by vessels declaring mackerel trips. The goal is to minimize unnecessary slippage events.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. If less than 5 slippage events occur the impacts may be negligible. Once terminations are triggered, some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3l. Related to 3j, 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 fleet-wide for the rest of that year. The goal is to minimize slippage events. The only slippages that would count against the cap are non-emergency events, so the exceptions 1, 2, and 3 in 3j would not count against the slippage cap. Operational discards (small quantities of fish that remain in the net) that are made available to the observer for visual access prior to discarding would also not count against the slippage cap. Requirements and provisions of the measure can be modified via the annual specifications process.
(PREFERRED)

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 10 non-exempt slippage events have occurred overall in a year by vessels declaring mackerel trips. The goal is to minimize unnecessary slippage events. The double underlined section is a minor modification from the original alternative in the DEIS and clarifies what kind of slippage events would count against the cap and allows the requirements and provisions of the cap to be modifiable via the annual specifications process.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. If less than 10 slippage events occur the impacts may be negligible. Once terminations are triggered, some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Negative socioeconomic impacts would presumably be less than with 3k where 5 slippage events triggers trip terminations upon additional slippages.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3m. Related to 3j, for longfin squid moratorium permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 5 slippage events have occurred overall in a trimester by vessels declaring longfin squid trips. The goal is to minimize unnecessary slippage events.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. If less than 5 slippage events occur per trimester the impacts may be negligible. Once terminations are triggered, some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3n. Related to 3j, 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 minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 10 slippage events have occurred overall in a trimester by vessels declaring longfin squid trips. The goal is to minimize unnecessary slippage events.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

It is difficult to predict the socio-economic impacts because participants are likely to have a wide variety of responses. If less than 10 slippage events occur per trimester the impacts may be negligible. Once terminations are triggered, some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Negative socioeconomic impacts would presumably be less than with 3m where 5 slippage events per trimester triggers trip terminations upon additional slippages.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

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 (3g, 3h, 3k-3n), then the relevant vessel would have to take an observer on its next trip.

This would reduce a vessel's incentive to slip a haul early in a trip in order to cause a trip termination and thereby avoid having an observer on board for an extended trip.

Summary of Biological Impact Analysis

This alternative would seek to discourage observer avoidance strategies so that data can be obtained on the composition of typical trips. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Vessels may experience reduced revenue and/or higher costs due to waiting for another observer or due to paying for another observer if an industry-funded observer program is in place.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

3p. Allow mackerel and/or longfin squid permitted vessels to be assigned an annual quota (set during specifications) of slippage events related to 3j, specified annually. Once their slippage quota was reached, vessels would have to terminate an observed trip as well as upon any slippage event on subsequent observed trips for the remainder of the calendar year.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once a certain number of slippage events have occurred annually by that same vessel. While this is more intensive to track (by vessel versus by fleet), the advantage is that one vessel is not penalized for another vessel's slippage event.

Summary of Biological Impact Analysis

If vessels being observed can release catch without it being recorded, observer data will be biased. Avoiding such events would improve the observer data and any analysis or management measures that depend on observer data, including reducing catch of non-target species including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

This alternative would allow the Council to consider implementing slippage triggers for trip termination upon additional slippage events at the individual vessel level. The advantage of having the slippage quota be vessel based is that vessels have a direct incentive to minimize unnecessary slippage events to save their slippage quota for when they really need it (e.g. due to safety issues) and thereby avoid situations where subsequent slippage events result in forced trip terminations. Trip terminations could still occur however.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

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2.1.4 Alternative Set 4 - Port-side and Other Sampling/Monitoring Measures

Background/Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements are insufficient to precisely estimate RH/S catch.

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates.

From a practical standpoint, it is more efficient to subsample the landings of river herring and other non-target species when a mackerel vessel reaches the dock than when it is at sea. Discards that occur at sea of non-target species are easier to monitor than are the landed fractions that go into the hold due to the large volumes that go into the hold. Dockside sampling could have higher sampling rates to better characterize the species in retained catch and an entire catch could be evaluated in one day or less as opposed to having a person at sea for multiple days. This option does not mean that at sea monitors are unnecessary – they are essential to monitor discards. However, since most RH/S are retained (esp. for mackerel trips), portside sampling could increase sampling coverage from current levels with lower costs than at-sea observers. For longfin squid trips the preceding discussion probably does not apply because most RH/S are discarded so they are not available dockside.

Several other sampling/monitoring alternatives are also included in the Alternative Set as described below including alternatives to require volumetric hold certification of Tier 3 mackerel limited access permits and longfin squid moratorium permit holders. While in Amendment 11 the fish hold certification was primarily for purposes of capacity control (not allowing vessels to reconfigure to have substantially larger fish holds), in this Amendment the measure is being considered for purposes of facilitating rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates. There is also an ongoing voluntary project by industry to use fleet communication to avoid river herring hotspots. Since this project uses extensive post-side sampling it was included in this Alternative Set – the relevant alternative in this document just commits the Council to consider the project's results once completed to determine potential management implications. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

4a. No-action

If this alternative is selected, then no measures from Alternative Set 4 would be implemented and the existing monitoring measures (as described in section 5.4) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

4b. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for mackerel landings over 20,000 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay providers directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

Summary of Biological Impact Analysis

To the degree that better incidental landings data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Non-target species would also benefit if the costs of monitoring generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Dockside monitors for groundfish cost $50-$70/hr and each trip would only require 1 sampling event compared to the $800/day of at-sea samplers (plus $400 in administrative costs). Different sized vessels would have different costs for offload monitoring due to different hold sizes and processor offload speeds, but a 6-14 hour offload from a 3-5 day trip would costs $300-$980 for dockside monitoring versus $3,600-$6,000 for observer costs. If the Council required 25%, 50%, 75%, or 100% of trips to be monitored then participants would have to pay for approximately that percentage of their trips to be monitored unless additional funds are available. Revenue information for different mackerel vessels/trips is available in Alternative Set 5 below.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

4c. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for longfin squid landings over 2,500 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay provider directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

Summary of Biological Impact Analysis

To the degree that better incidental landings data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. However, since most RH/S caught on longfin squid trips are discarded rather than retained, portside sampling is probably would not be an effective way to obtain RH/S catch information. Non-target species would benefit if the costs of monitoring generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Dockside monitors for groundfish cost $50-$70/hr and each trip would only require 1 sampling event compared to the $800/day of at-sea samplers (plus $400 in administrative costs). Different sized vessels would have different costs for offload monitoring due to different hold sizes and processor offload speeds, but a 6-14 hour offload from a 3-5 day trip would costs $300-$980 for dockside monitoring versus $3,600-$6,000 for observer costs. If the Council required 25%, 50%, 75%, or 100% of trips to be monitored then participants would have to pay for approximately that percentage of their trips to be monitored unless additional funds are available. Revenue information for different mackerel vessels/trips is available in Alternative Set 5.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

4d. Require volumetric vessel-hold certification for Tier 3 limited access mackerel permits and specify a volume to weight conversion.

Summary of Biological Impact Analysis

This alternative could facilitate rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates.
To the degree that better incidental landings data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Informal contacts by council staff with several marine surveyors during the Amendment 11 development process revealed that a fish hold measurement could run approximately $13.30-$40 per foot of vessel length, which could range from as low as $1,000 for a 75 foot vessel to as high as $6,000 for a 150 foot vessel, not including travel expenses. To the extent that surveys are already required for insurance purposes these costs may be already part of a vessels operating costs. Industry members have communicated to Council staff that, while some smaller vessels are configured in a way that could facilitate hold certifications (the refrigerated seawater or "tank" boats), many vessels that participate in a "fresh" product fishery are not configured in a way that facilitates a certification of a fixed hold capacity.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

4e. Require volumetric vessel-hold certification for longfin squid moratorium permits and specify a volume to weight conversion.

Summary of Biological Impact Analysis

This alternative could facilitate rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates. To the degree that better incidental landings data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

Informal contacts by council staff with several marine surveyors revealed that a fish hold measurement could run approximately $13.30-$40 per foot of vessel length, which could range from as low as $1,000 for a 75 foot vessel to as high as $6,000 for a 150 foot vessel, not including travel expenses. To the extent that surveys are already required for insurance purposes these costs may be already part of a vessels operating costs. Industry members have communicated to Council staff that, while some longfin squid vessels are configured in a way that could facilitate hold certifications (the refrigerated seawater or "tank" boats), many vessels that participate in a "fresh" product fishery are not configured in a way that facilitates a certification of a fixed hold capacity.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

4f. Within 6 months of the completion of the Sustainable Fisheries Coalition RH/S avoidance project (expected late 2013), the Council will meet to formally review the results and consider the appropriateness of developing a framework adjustment to implement any additional catch avoidance strategies that are suggested by the results of the Sustainable Fisheries Coalition avoidance project. (PREFERRED)

This would commit the Council to consider the findings from this project as they could apply to reducing the catch of RH/S in pelagic fisheries. Full details on this project are included in Appendix 7, but generally the project is testing if oceanographic and fishery data can be used to help industry avoid potential RH/S hotspots. Implementing measures similar to this project (i.e. making participation mandatory) would be a frameworkable action.

Summary of Biological Impact Analysis

No immediate impacts would be expected. This would ensure that the Council considers the findings from this project as they could apply to reducing the catch of river herrings and/or shads in pelagic fisheries. Impacts would not be known until completion of the Sustainable Fisheries Coalition avoidance project and alternatives were developed, which would be subsequently analyzed and considered separately.

Summary of Socio-Economic Impact Analysis

No immediate impacts would be expected. There are no costs associated with considering the results of the Sustainable Fisheries Coalition avoidance project. If the project revealed a way for industry to cooperatively and voluntarily avoid RH/S such work could lead to a cost-efficient way to reduce RH/S interactions. Any potential actions would be subsequently analyzed and considered separately.

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2.1.5 Alternative Set 5 – At-Sea Observer Coverage Requirements

Background/Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements is insufficient to precisely estimate RH/S catch.

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. The focus of these alternatives is on increasing the observer coverage rates of mackerel and longfin squid trips. Implementation of mandatory coverage would require a trip notification provision to be implemented as well (see Alternative Set 1). NMFS has strongly communicated that the at-sea portion of any additional observer coverage would have to be paid for by industry. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

NOTE ON C.V.s (coefficient of variation): A C.V. of 0.30 means that the true value has approximately a 95% probability of being within ± 60% of the estimate. A C.V. of 0.20 means that the true value has approximately a 95% probability of being within ± 40% of the estimate (both assuming a normal distribution of data). Also, since some sources of uncertainty are not integrated into the C.V. calculations, the C.V.s generated by the science center are lower (look better) than they really are. As described in Section 5, since obtaining a given C.V. can require very different coverage levels from year to year, and the inter-annual variability in the data drives the precision, it may be quite difficult to consistently obtain precise catch estimates via observer data when the coverage levels are determined from prior years' data (as occurred with the SBRM).

NOTE ON COMBINATIONS: Only one of the 5b (observer coverage for mackerel mid-water trawl) alternatives could be chosen. Likewise, only one of the 5c (observer coverage for mackerel small mesh bottom trawl) and one of the 5d (observer coverage for longfin squid small mesh bottom trawl) alternatives could be chosen. One alternative from each of these could be selected (a total of three). 5e1 and 5e2 (strata-fleet alternatives for mid-water trawl) are mutually exclusive as are 5e3 and 5e4 (strata-fleet alternatives for small mesh bottom trawl) but one alternative from the first pair could be chosen with one from the second pair. If any of the 5e alternatives were chosen, they would not be combinable with any of the 5b, 5c, or 5d alternatives (coverage could be based on a set percentage of trips or a set target coefficients of variation (C.V.s) but not both). 5f, 5g, and 5h provide for industry funding and review of the increased observer coverage levels proposed in 5b-5e so they could be added on to any of the other action alternatives.

If any measure in this Alternative Set is selected for mackerel, the Council would also need to select Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

5a. No-action

If this alternative is selected, then no measures from Alternative Set 5 would be implemented and the existing observer measures (as described in section 5.5) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

5b. Mackerel Mid-Water Trawl (MWT)

Coverage of this fleet has historically primarily occurred because of the winter mixing of the herring and mackerel fisheries as opposed to focusing on the mackerel fishery. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation.

5b1. Require 25% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b2. Require 50% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b3. Require 75% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b4. Recommend 100% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

Note: Require was also changed to recommend since the Council makes recommendations to NMFS.

Summary of Biological Impact Analysis

Coverage of this fishery has historically been low, leading to low precision of RH/S catch estimates. Higher coverage would lead to better precision. To the degree that better data is used

to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since mackerel trips do not comprise all MWT activity, one can not specify the precision for RH/S catches in MWT gear if only mackerel trips increase observer coverage. Details on expected precision if all MWT activity achieved the above coverage levels can be found in Section 7. Non-target species would also benefit if the costs of coverage generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

NMFS has strongly communicated that the at-sea portion of any additional observer coverage would have to be paid for by industry. The at-sea cost of observers in the Northeast region is about $800 per day at sea while NMFS incurs about $400/day in administrative costs. The alternatives recommended by the Council for industry funding specify that vessels would pay $325/day toward the cost of observers to meet the Council's goals. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, cost data collected through the observer program was used to estimate the increase in daily trip costs that $325/day would cause for MWT mackerel trips:

-9% for single MWT mackerel trips ($3,494 to $3,819)
-12% for paired MWT mackerel trips ($2,602 to $2,927)

The average trip cost values cited in this analysis include variable costs such as fuel, oil, ice, food, fishing supplies, vessel/gear damages, and water but do not include crew shares/wages, dockage fees, or boat mortgage payments. Trip costs were estimated based on 2010 observer data. These are the larger, higher-volume vessels – smaller vessels that start off with lower costs would see a higher percentage increase.

While the per-trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on midwater trawl trips that kept 20,000 pounds or more of mackerel. These trips averaged 643 sea days each year ranging from 272 in 2010 to 926 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (643) were observed it would require 161, 322, 482, and 643 days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.05 million, $0.10 million, $0.16 million, and $0.21 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.06 million, $0.13 million, $0.19 million, and $0.26 million per year respectivly.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

5c. Mackerel Small Mesh Bottom Trawl (SMBT)

A very small percentage of mackerel trips are observed overall. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5c1. Require 25% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c2. Require 50% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c3. Require 75% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c4. Recommend the following observer coverages percentages for mackerel limited access vessels intending to fish for or retain over 20,000 pounds of mackerel when using small mesh (<3.5 inches) bottom trawl gear: Tier 1: 100%; Tier 2: 50%; Tier 3: 25%. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

Note: The double underlined section highlights a modification from the original alternative in the DEIS. 5c4 has been modified to essentially combine 5c1, 5c2, and the original 5c4 by applying higher coverage levels for the higher tier vessels and lower coverage levels for the lower tier vessels. Since the original alternatives considered 25%-100% coverage applied to all mackerel permitted vessels, the modified alternative is within the scope of the alternatives considered in the DEIS. The rationale is that the vessels accounting for most mackerel landings should have the highest levels of coverage and other vessels would have coverage in proportion to their potential landings. Require was also changed to recommend since the Council makes recommendations to NMFS.

Summary of Biological Impact Analysis

Coverage of this fishery has historically been low, leading to low precision of RH/S catch estimates. Higher coverage would lead to better precision. To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since mackerel trips comprise a small part of SMBT activity, one can not specify the precision for RH/S catches in SMBT gear if only mackerel trips increase observer coverage. Details on expected precision if all SMBT activity achieved the above coverage levels can be found in Section 7. Non-target species would also benefit if the costs of coverage generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

NMFS has strongly communicated that the at-sea portion of any additional observer coverage would have to be paid for by industry. The at-sea cost of observers in the Northeast region is about $800 per day at sea while NMFS incurs about $400/day in administrative costs. The alternatives recommended by the Council for industry funding specify that vessels would pay $325/day toward the cost of observers to meet the Council's goals. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, cost data collected through the observer program was used to estimate the increase in daily trip costs that $325/day would cause for higher volume SMBT mackerel trips:

-20% for higher volume SMBT mackerel trips ($1,639 to $1,964)

The average trip cost values cited in this analysis include variable costs such as fuel, oil, ice, food, fishing supplies, vessel/gear damages, and water but do not include crew shares/wages, dockage fees, or boat mortgage payments. Trip costs were estimated based on 2010 observer data. These are the larger, higher-volume vessels – smaller vessels that start off with lower costs would see a higher percentage increase.

While the per trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on SMBT trips that kept 20,000 pounds or more of mackerel. These trips averaged 172 sea days each year ranging from 113 in 2009 to 286 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (172) were observed it would require 43, 86, 129, and 172 days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.01 million ($14,000), $0.03 million, $0.04 million, and $0.06 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.02 million, $0.03 million, $0.05 million, and $0.07 million per year respectivly.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

5d. Longfin Squid Small Mesh Bottom Trawl (SMBT)

While coverage has increased in 2011 related to the implementation of the butterfish mortality cap on the longfin squid fishery, a small percentage of longfin squid trips have been observed historically. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5d1. Require 25% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d2. Require 50% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d3. Require 75% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d4. Require 100% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

Summary of Biological Impact Analysis

Coverage of this fishery has historically been low, leading to low precision of RH/S catch estimates. Higher coverage would lead to better precision. To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since longfin squid trips do not comprise all SMBT activity, one can not specify the precision for RH/S catches in SMBT gear if only longfin squid trips increase observer coverage. Details on expected precision if all SMBT activity achieved the above coverage levels can be found in Section 7. Non-target species would also benefit if the costs of coverage generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

NMFS has strongly communicated that the at-sea portion of any additional observer coverage would have to be paid for by industry. The at-sea cost of observers in the Northeast region is about $800 per day at sea while NMFS incurs about $400/day in administrative costs. The alternatives recommended by the Council for industry funding specify that vessels would pay $325/day toward the cost of observers to meet the Council's goals. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, cost data collected through the observer program was used to estimate the increase in daily trip costs that $325/day would cause:

-35% for higher volume SMBT longfin squid trips ($939 to $1,264)
-77% for lower volume SMBT longfin squid trips ($424 to $749)

The average trip cost values cited in this analysis include variable costs such as fuel, oil, ice, food, fishing supplies, vessel/gear damages, and water but do not include crew shares/wages, dockage fees, or boat mortgage payments. Trip costs are based on 2010 observer data.

While the per trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 2,500 pound longfin squid trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on SMBT trips that kept 2,500 pounds or more of longfin squid. These trips averaged 5,357 sea days each year ranging from 3,932 in 2010 to 6,743 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (5,357) were observed it would require 1339, 2678, 4017, and 5,357 sea days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.4 million, $0.9 million, $1.3 million, and $1.7 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.5 million, $1.1 million, $1.6 million, and $2.1 million per year respectivly. However, there may be returns to scale in the sense that at higher coverage levels NMFS marginal costs may become less than $400/day.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

5e. Strata-Fleet-Based Alternatives

Analysis performed for the amendment and detailed in Section 7 suggests that around 65% coverage could result in a 0.3 C.V. goal and about 90% coverage could result in a 0.2 C.V. goal for Mid-Atlantic MWT for alewife and blueback. Also, for small mesh bottom trawl, around 40% coverage could result in a 0.3 C.V. goal and about 60% coverage could result in a 0.2 C.V. goal for alewife and blueback. This was determined by averaging the required sea days from 2009-2010 for these goals, and then comparing those averages with total average days at sea for relevant trips from VTR data, 2009-2010. However it is emphasized that from year to year it will be very hard to hit a particular C.V. target due to the inherent variability from year to year in both the directed fisheries involved and their catch of river herrings. Since one cannot predict which years will require the highest coverage, some years would likely be over covered and some years would be under covered if coverage rates are determined by the previous year's data.

Note: This alternative has a major implementation issue in that NMFS has said it will not approve increased observer coverage that is not funded by industry but the MAFMC cannot compel all fisheries by gear type to pay for observer coverage (only its own).

The following sub-alternatives would require coverage levels that would be expected to result in the specified C.V. levels for river herrings. Shad were not included because very high coverage levels would be required to achieve the respective C.V.s due to lower encounter rates.

5e1. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.30.

5e2. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.20.

5e3. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.30.

5e4. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.20.

Summary of Biological Impact Analysis

To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Non-target species would also benefit if the costs of coverage generally discouraged effort which would reduce interactions.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The approximate cost for an observer is $800/day. In addition to at-sea costs, NMFS has estimated that it incurs approximately $400/day in administrative costs related to each additional day at sea.

Compared to the approximate sea days provided in 2010, achieving a 0.3 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 232-476 extra sea days (costing about $0.2-$0.4 million) and achieving a 0.2 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 686-344 extra sea days (costing about $0.3-$0.5 million), with at sea costs being $800/day. Administrative costs to NMFS would equal an additional 50% of the at-sea costs ($400/day). The range is related to the fact that C.V.s vary from year to year related to variation in the underlying data.

Compared to the approximate sea days provided in 2010, achieving a 0.3 C.V. for both blueback herring and alewife in the SMBT (Mid-Atlantic and New England) would require 1,410-2,478 extra sea days (costing about $1.1-$2.0 million) and achieving a 0.2 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 2,850-3,757 extra sea days (costing about $2.3-$3.0 million), with at sea costs being $800/day. Administrative costs to NMFS would equal an additional 50% of the at-sea costs ($400/day). The range is related to the fact that C.V.s vary from year to year related to variation in the underlying data.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

5f. Vessels would have to pay $325 (modifiable via specifications) for observers when they carry observers to meet the observer coverage goals adopted by the Council in 5b4 and 5c4. NEFSC would accredit observers and vessels would have to contract and pay observers. (PREFERRED)

Note: This alternative represents a modification from the original alternative in the DEIS. In the original alternative, vessels had to pay the full cost of observer days beyond the standard NMFS-established coverage. The Council modified this alternative such that vessels selected for coverage would have to pay $325 per day to fund the overall observer goals. Since the original alternative considered full industry funding of the required observer days, this is within the range between no funding and full funding. The original DEIS analyzed industry paying for 100% of the at-sea cost ($800) of all related observer trips due to the possibility of reduced federal funding of observers in the future, so having all observed trips pay only $325 lies in between the no action and the original alternative.

Summary of Biological Impact Analysis

Biological impacts should be independent of who pays for data.

Summary of Socio-Economic Impact Analysis

See 5b-5e above.

5g. Phase-in industry funding over 4 years such that to achieve the target coverage selected in 4b-4e above, NMFS would pay for 100%, 75%, 50%, then 25% of the at-sea portion of the specified observer coverage (NOTE: NMFS has indicated this is not feasible from a funding point of view).

Summary of Biological Impact Analysis

Biological impacts should be independent of who pays for data.

Summary of Socio-Economic Impact Analysis

Alternatives 5b-5e above compare the cost of observer coverage relative to different coverage levels and precision targets. In the short term cost-sharing with NMFS would make the economic impacts less but would not have an impact on the long term. For this alternative, if NMFS paid 100% of the observer coverage there would be negligible socio-economic impacts. For the phase in years, the impacts per trip would be the same as described above, but the number of trips for which industry would have to pay for observers would be less, at least initially.

5h. Require reevaluation of coverage requirement after 2 years to determine if catch rates justify continued expense of continued high coverage rates. (PREFERRED)

The Council would conduct an examination of the results of any higher coverage rates implemented through this action and consider if adjustments to the coverage rates are warranted. Depending on the results and desired actions, subsequent action could be accomplished via specifications, a framework adjustment, or an Amendment as appropriate.

Summary of Biological Impact Analysis

No immediate impacts would be expected. Any potential follow-up actions would be subsequently analyzed and considered separately.

Summary of Socio-Economic Impact Analysis

No immediate impacts would be expected. Any potential follow-up actions would be subsequently analyzed and considered separately.

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2.1.6 Alternative Set 6 - Mortality Caps

Background/Statement of Problem/Need for Action:

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements.

The alternatives would seek to directly limit the mortality of the relevant RH/S species in the mackerel and longfin squid fisheries. While the actual mortality cap quantities would be determined during the specifications process just as annual ACLs/AMs are set, this document explores a range of options so that likely impacts may be evaluated. The range of mortality cap quantities would be evaluated in an environmental assessment during the specifications process (though without comprehensive RH/S assessments it is not possible to determine if any particular quantity of RH/S catch is sustainable). The following values are primarily provided to give the reader a sense of impacts from a range of mortality caps that will be investigated in greater depth during the specifications process. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative. It is possible that a single cap for RH/S combined may be used to implement the preferred alternatives 6b and 6c if the Council chooses to do so via the annual specifications.

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

6a. No-action

If this alternative is selected, then no measures from Alternative Set 6 would be implemented and the existing state management measures (as described in section 5.9) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

6b. Implement a mortality cap for river herrings for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

One way to assign mortality caps for river herring would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl (MWT) fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 35% of total river herring mortality 2005-2010. MWT fishing in Quarter 1 is mixed, with mackerel comprising over 50 % of the landings, but herring making up a large amount of landings in January (see Figure 21A of Appendix 2). The table below describes total ocean and quarter 1 mid-water trawl mortalities in the leftmost columns.

Table 1. Example River Herring Caps For Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (35% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.86%	Mackerel would close at these landings (mt) with mean ratio, 0.45%	Mackerel would close at these landings (mt) with low ratio, 0.02%
2006	245	86	9,975	19,063	428,908
2007	664	232	27,029	51,656	1,162,263
2008	672	235	27,333	52,237	1,175,335
2009	361	126	14,679	28,053	631,190
2010	244	85	9,911	18,940	426,160

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual river herring mortality ratios from 0.02% in 2007 to .86% in 2009 with a mean of 0.45. If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the mackerel fishery was shut down by the river herring mortality cap is illustrated in the rightmost 3 columns depending of the ratio of river herring. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the mackerel availability was. In the above table the range of caps is just a percentage of the observed catch over the years 2006-2010. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all.

Summary of Biological Impact Analysis

If a cap was set low enough to shut the directed fishery down, there would be some benefits to RH/S. However, since the linkage between catch of RH/S and RH/S stock status and productivity is not known, the impacts are not quantifiable. Smaller caps and earlier closures should lead to relatively higher benefits.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

If a low cap is chosen and a high ratio is observed, the directed fishery would close due to the cap before it reached the directed fishery quota. This could result in revenue losses to fishery participants that would be dependent on the exact level of the cap, the catch ratio, and prices for the directed species that are "left in the water" because of the cap closure. The ranges described in the above table would suggest potentially forgone revenue as high as about $8 million or as

low as zero dollars at 2010 ex-vessel prices depending on the above factors and based on the 2012 quota.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

6c. Implement a mortality cap for shads for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

One way to assign mortality caps for shad would be to base it on the range of estimated shad mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 12% of total shad mortality 2005-2010. The table below describes total ocean and quarter 1 mid-water trawl mortalities in the leftmost columns (2006 omitted because of lack of shad records).

Table 2. Example Shad Caps For Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (12% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.05%	Mackerel would close at these landings (mt) with mean ratio, 0.03%	Mackerel would close at these landings (mt) with low ratio, 0.004%
2007	60	7	14,364	23,940	179,550
2008	60	7	14,450	24,084	180,630
2009	70	8	16,903	28,172	211,290
2010	47	6	11,338	18,896	141,720

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual shad mortality ratios from 0.004% in 2009 to 0.05% in 2007 with a mean of 0.03. If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the mackerel fishery was shut down by the shad mortality cap is illustrated in the rightmost 3 columns depending of the ratio of shad. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the mackerel availability was. In the above table the range of caps is just a percentage of the observed catch over the years 2006-2010. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all.

Summary of Biological Impact Analysis

If a cap was set low enough to shut the directed fishery down, there would be some benefits to RH/S. However, since the linkage between catch of RH/S and RH/S stock status and productivity is not known, the impacts are not quantifiable. Smaller caps and earlier closures should lead to relatively higher benefits.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

If a low cap is chosen and a high ratio is observed, the directed fishery would close due to the cap before it reached the directed fishery quota. This could result in revenue losses to fishery participants that would be dependent on the exact level of the cap, the catch ratio, and prices for the directed species that are "left in the water" because of the cap closure. The ranges described in the above table would suggest potentially forgone revenue as high as about $7 million or as low as zero dollars at 2010 ex-vessel prices depending on the above factors and compared to full utilization of a quota at the 2012 level.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

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6d. Implement a mortality cap for river herrings for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S).

One way to assign mortality caps for river herring would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 5% of total river herring mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 5% of total mortalities in the leftmost columns.

Table 3. Example River Herring Caps For Longfin Squid

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.17%	Longfin squid would close at these landings (mt) with mean ratio, 0.06%
2006	245	12	7,233	20,424
2007	664	33	19,534	55,346
2008	672	34	19,754	55,968
2009	361	18	10,608	30,057
2010	244	12	7,162	20,293

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid (encompasses almost all landings) results in annual river herring mortality ratios from almost zero in 2007 to .17% in 2009 with a mean of 0.06%. If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the river herring mortality cap is illustrated on the rightmost 2 columns depending of the ratio of river herring. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the longfin squid availability was. In the above table the range of caps is just a percentage of the observed catch over the years 2006-2010. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all.

Summary of Biological Impact Analysis

If a cap was set low enough to shut the directed fishery down, there would be some benefits to RH/S. However, since the linkage between catch of RH/S and RH/S stock status and productivity is not known, the impacts are not quantifiable. Smaller caps and earlier closures should lead to relatively higher benefits.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

If a low cap is chosen and a high ratio is observed, the directed fishery would close due to the cap before it reached the directed fishery quota. This would result in revenue losses to fishery participants that would be dependent on the exact level of the cap and the catch ratio, and prices for the directed species that "is left in the water" because of the cap closure. The ranges described in the above table would suggest potentially forgone revenue as high as about $35 million or as low as zero dollars at 2010 ex-vessel prices depending on the above factors and compared to full utilization of a quota at the 2012 level.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

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6e. Implement a mortality cap for shads for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S).

One way to assign mortality caps for shad would be to base it on the range of estimated shad mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 11.5% of total shad mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 11.5% of total mortalities in the leftmost columns.

Table 4. Example Shad Caps For Longfin Squid

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (11.5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.21%	Longfin squid would close at these landings (mt) with mean ratio, 0.10%	Longfin squid would close at these landings (mt) with low ratio, 0.03%
2006	47	5	2,587	5,433	18,109
2007	60	7	3,278	6,883	22,943
2008	60	7	3,297	6,924	23,081
2009	70	8	3,857	8,099	26,998
2010	47	5	2,587	5,433	18,109

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid (encompasses almost all landings) results in annual shad mortality ratios from almost 0.03% in 2009 to 0.21% in 2010 with a mean of 0.10%. If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the shad mortality cap is illustrated in the rightmost 2 columns depending of the ratio of shad. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the longfin squid availability was. In the above table the range of caps is just a percentage of the observed catch over the years 2006-2010. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all.

Summary of Biological Impact Analysis

If a cap was set low enough to shut the directed fishery down, there would be some benefits to RH/S. However, since the linkage between catch of RH/S and RH/S stock status and productivity is not known, the impacts are not quantifiable. Smaller caps and earlier closures should lead to relatively higher benefits.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

If a low cap is chosen and a high ratio is observed, the directed fishery would close due to the cap before it reached the directed fishery quota. This would result in revenue losses to fishery participants that would be dependent on the exact level of the cap and the catch ratio, and prices for the directed species that "is left in the water" because of the cap closure. The ranges described in the above table would suggest potentially forgone revenue as high as about $45 million or as low as zero dollars at 2010 ex-vessel prices depending on the above factors and based on the proposed 2012 quota.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

6f. Add mortality caps to list of measures that can be frameworked. (PREFERRED)

Summary of Biological Impact Analysis

Allowing a cap to be considered via a framework should not have any impacts other than allowing more rapid management responses in the future. No immediate impacts would be expected. Any potential follow-up actions would be subsequently analyzed and considered separately.

Summary of Socio-Economic Impact Analysis

Allowing a cap to be considered via a framework should not have any impacts other than allowing more rapid management responses in the future. No immediate impacts would be expected. Any potential follow-up actions would be subsequently analyzed and considered separately.

2.1.7 Alternative Set 7 – Restrictions in areas of high RH/S catch

Background/Statement of Problem/Need for Action:

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements

The Council originally hoped to include some alternatives that would restrict fishing in relatively small areas that appeared to be "hotspots" for RH/S catch. The Amendment's Fishery Management Action Team's found that small-area management is unlikely to be successful (see Appendices 1 & 2). Because the Council instructed the FMAT to generate area-based alternatives that would be likely to provide protection to RH/S, the FMAT generated several alternatives that are area based but the FMAT also acknowledged that such large-scale closures would effectively close the fisheries for many participants.

Council staff attempted to perform additional smaller-scale examinations of the data (for example around Hudson canyon) and while at such small scales there were too few observations to draw conclusions, even at small scales catch events usually exhibited strong spatial-temporal variability.

The FMAT analysis suggests that because of the spatial and temporal variability of observed (Northeast Fishery Observer Program or "NEFOP") RH/S catch, the same kind of variability in mackerel and longfin squid effort and catch, and the same kind of variability in RH/S NEFSC trawl survey catches, that very large areas would be required to ensure that management was not just redistributing effort, possibly in a way that even increased RH/S catch. For this reason Council staff used the FMAT GIS analysis (See appendices 1 and 2) to construct areas for mackerel and longfin squid based on the mid-water and small-mesh bottom trawl fleet effort data and RH/S catch data. The table below is designed to help illustrate how even if you reduce catch rates of one species, for example blueback, but reduce catch rates of the directed species (for example mackerel) even more, it can be possible to do more harm than good if the fleet increases effort to maintain the same amount of harvest. In the table below "good" means a net reduction of blueback catch, "negligible" means no appreciable change, and "bad" means a net increase in blueback catch. The general point is that if RH/S catch rates are reduced but targeted species catch rates are reduced more, the net effect (because of more overall effort) may be bad for RH/S. Larger areas would not allow such redistribution of effort however. A summary of the key biological and human community impacts (detailed in section 7) follows for each alternative.

Table 5. Direct-Non-target Impact Schematic

Effects on RH catch of moving effort assuming effort changes to maintain constant mackerel catch if CPUE changes

		Mackerel		
	CPUE Changes	neutral	a little lower	a lot lower
Blueback	neutral	negligible	bad	bad
	a little lower	good	negligible	bad
	a lot lower	good	good	negligible

NOTE ON COMBINATIONS: 7bMack and 7cMack are mutually exclusive – the Council could close the area to directed fishing (7bMack) or require observers (7cMack) but not both. Likewise 7bLong and 7cLong are mutually exclusive – the Council could close the area to directed fishing (7bLong) or require observers (7cLong) but not both. One of the mackerel alternatives (either 7bMack or 7cMack) could be combined with one of the longfin squid alternatives (either 7bLong or 7cLong) however. 7d could be added to any 7b or 7c alternative to make those provisions only applicable after a cap-based trigger was reached. The Council would have to specify in this case that the Alternative Set 6 cap trigger was only a trigger for Alternative Set 7 rather than a stand-alone cap measure. 7e could be chosen in addition to any other alternative in this Alternative Set.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (7cMack and 7cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

7a. No-action regarding large closed areas (PREFERRED)

If this alternative is selected, then no measures from Alternative Set 7 would be implemented and the existing state management measures (as described in section 5.9) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

7bMack. Closed Area - Prohibit retention of more than 20,000 pounds of mackerel in RH/S Mackerel Management Area (applies in quarter 1 only – see map below) for vessels with federal mackerel permits.

Summary of Biological Impact Analysis

Given the RH/S Mackerel Management Area encompasses most quarter-one mid-water trawl effort as well as most quarter-one observer data observations of RH/S catch, which are estimated to account for 35% of total RH/S catch, it is likely that effectively closing this area to mackerel fishing would create some positive impacts for mackerel as well as RH/S and other non-target species, but it is not possible to quantify the effect (if any) on RH/S stocks of catching one amount of RH/S versus some other amount due to the paucity of assessment information.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

As described in the table below, about 85% of mackerel revenues with an assigned area (2/3 to ¾ of total landings) from 2006-2010 came from within the RH/S Mackerel Management Area. While vessels would compensate as best they could so impacts are difficult to further quantify, vessels that typically rely on mackerel would likely suffer economically.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

Table 6. Distribution of Mackerel Revenues in and out of RH/S Area

	Outside Mackerel Value ($)	Inside Mackerel Value ($)
2006	3,149,111	17,323,851
2007	946,926	2,666,001
2008	553,705	3,200,344
2009	681,665	6,655,122
2010	471,663	2,920,919
Total	5,803,070	32,766,237
%	15%	85%

Source: Unpublished VTR Data

<u>7bLong</u>. Closed Area - Prohibit retention of more than 2,500 pounds longfin squid in RH/S Longfin Squid Management Area (applies year-round – see maps below) for vessels with federal longfin squid moratorium permits.

<u>Summary of Biological Impact Analysis</u>

Given the RH/S Longfin Squid Management Area encompasses most small mesh bottom trawl effort, which is responsible for 24% of RH/S catch, it is likely that effectively closing this area to longfin squid fishing would create some positive impacts for longfin squid as well as non-target species such as RH/S, but it is not possible to quantify the effect (if any) on RH/S stocks of catching one amount of RH/S versus some other amount due to the paucity of assessment information. However, examination of targeting information in the observer data suggests that RH/S encounters in SMBT fisheries are more associated with targeting of Alt Herring so impacts may not be large from restrictions only on SMBT longfin squid fishing.

<u>Summary of Socio-Economic Impact Analysis</u>

Impacts are mixed with an uncertain net impact.

As described in the table below, about 71% of longfin squid kept catch (VTR data) from 2006-2010 came from within the RH/S longfin squid Management Area. While vessels would compensate as best they could so impacts are difficult to further quantify, vessels that typically rely on longfin squid would likely suffer economically.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

Table 7. Distribution of longfin squid VTR catches in and out of RH/S Area.

	Outside Loligo Pounds	Inside Loligo Pounds
2006	7,139,722	30,323,237
2007	16,516,551	12,991,085
2008	6,692,942	20,772,623
2009	4,352,451	17,991,543
2010	4,050,619	12,510,747
Total	38,752,285	94,589,235
%	29%	71%

Source: Unpublished VTR Data

7cMack. Require observers in RH/S Mackerel Management Area (applies in quarter 1 only – see map below) for vessels with federal mackerel permits to retain more than 20,000 pounds of mackerel. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

Summary of Biological Impact Analysis

To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. To the degree that fishermen did not fish because of the requirement there could be benefits to the managed species as well as non-target species and protected resources. To the extent that fishermen transferred effort there could be unknown impacts on other managed species, non-target species, habitat, and protected resources.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The cost of observers relative to vessel revenues and existing costs is described in Alternative Set 5.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

7cLong. Require observers in RH/S longfin squid Management Area (applies year round) for vessels with federal longfin squid permits to possess more than 2,500 pounds of longfin squid. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

Summary of Biological Impact Analysis

To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. To the degree that fishermen did not fish because of the requirement there could be benefits to the managed species as well as non-target species, habitat, and protected resources. To the extent that fishermen transferred effort there could be unknown impacts on other managed species, non-target species, habitat, and protected resources.

Summary of Socio-Economic Impact Analysis

Impacts are mixed with an uncertain net impact.

The cost of observers relative to vessel revenues and existing costs is described in Alternative Set 5.

While there are human community costs associated with this alternative, there also could be human community benefits as described in Section 2.1.

7d. Make above requirement(s) in effect only when a mortality cap "trigger" is reached. Operation of a "trigger" would be identical to the operation of a mortality cap (see Alternative Set 6 above) but the consequence of hitting the cap would be implementing 7b and/or 7c above if this alternative is selected in conjunction with 7b and/or 7c above. Trigger levels would be specified annually via specifications.

This option would use a mortality cap but instead of shutting down the fishery either the closed area or 100% observer coverage requirements in this Alternative Set would go into force. This alternative could only be selected in conjunction with 7b and/or 7c above.

Summary of Biological Impact Analysis

To the degree that a mortality cap gave fishermen incentive to avoid RH/S there could be positive impacts to RH/S. Once a cap was reached, then the same impacts as discussed above with 7b and/or 7c would be applicable but to a lesser degree since they would not be in force for the full year.

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Summary of Socio-Economic Impact Analysis

To the degree that a mortality cap gave fishermen the opportunity to avoid RH/S and avoid more onerous requirements such as 7b or 7c above, a mortality cap trigger could have a positive impact compared to 7b or 7c alone. Once a cap was reached, then the same impacts as discussed above with 7b and/or 7c would be applicable but to a lesser degree since they would not be in force for the full year.

7e. Stipulate that any areas designated in Amendment 14 would be considered for updating every other year in specifications considering the most recent data available when specifications are developed.

Summary of Biological Impact Analysis

7e should not have any impacts other than facilitating future management responses.

Summary of Socio-Economic Impact Analysis

7e should not have any impacts other than facilitating future management responses.

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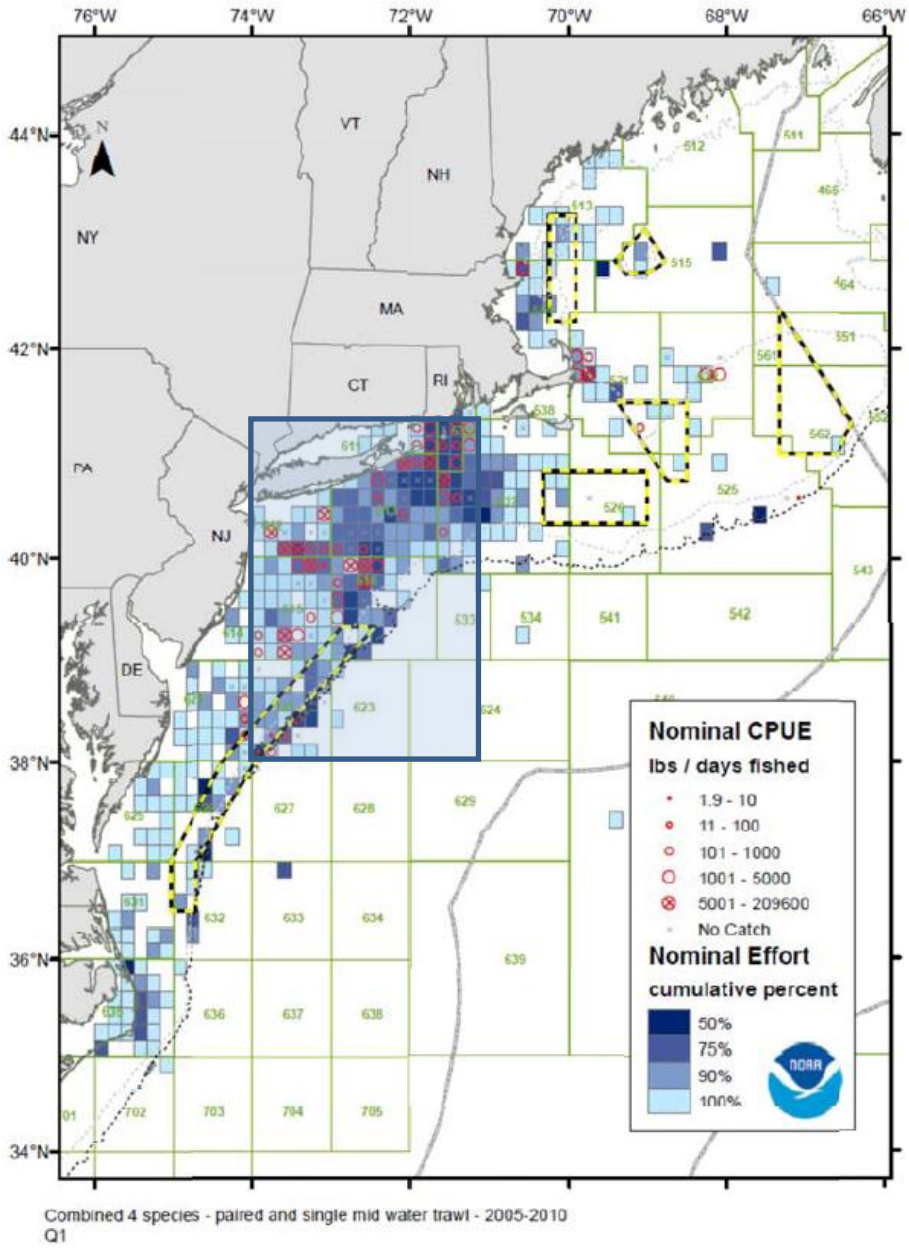
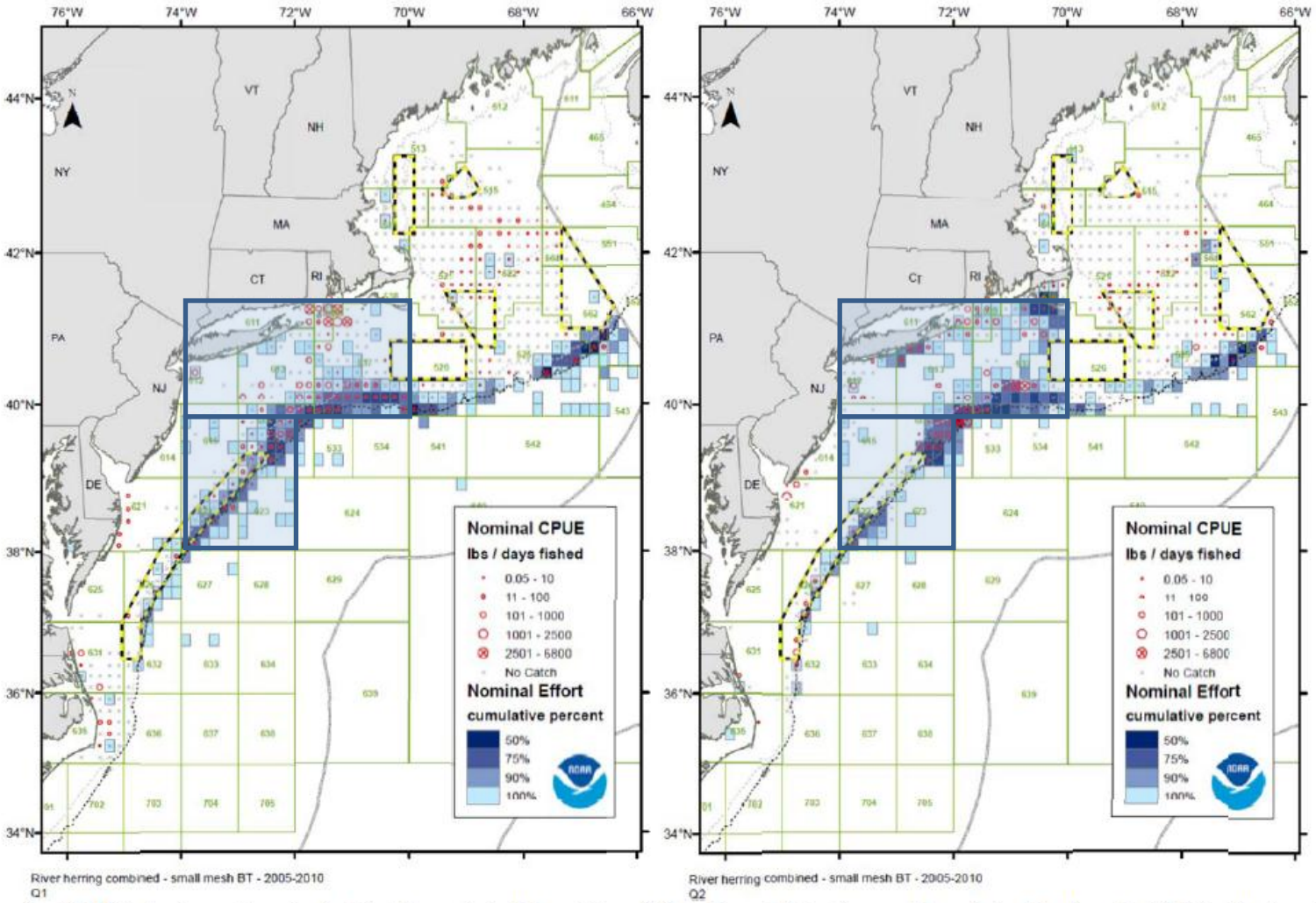
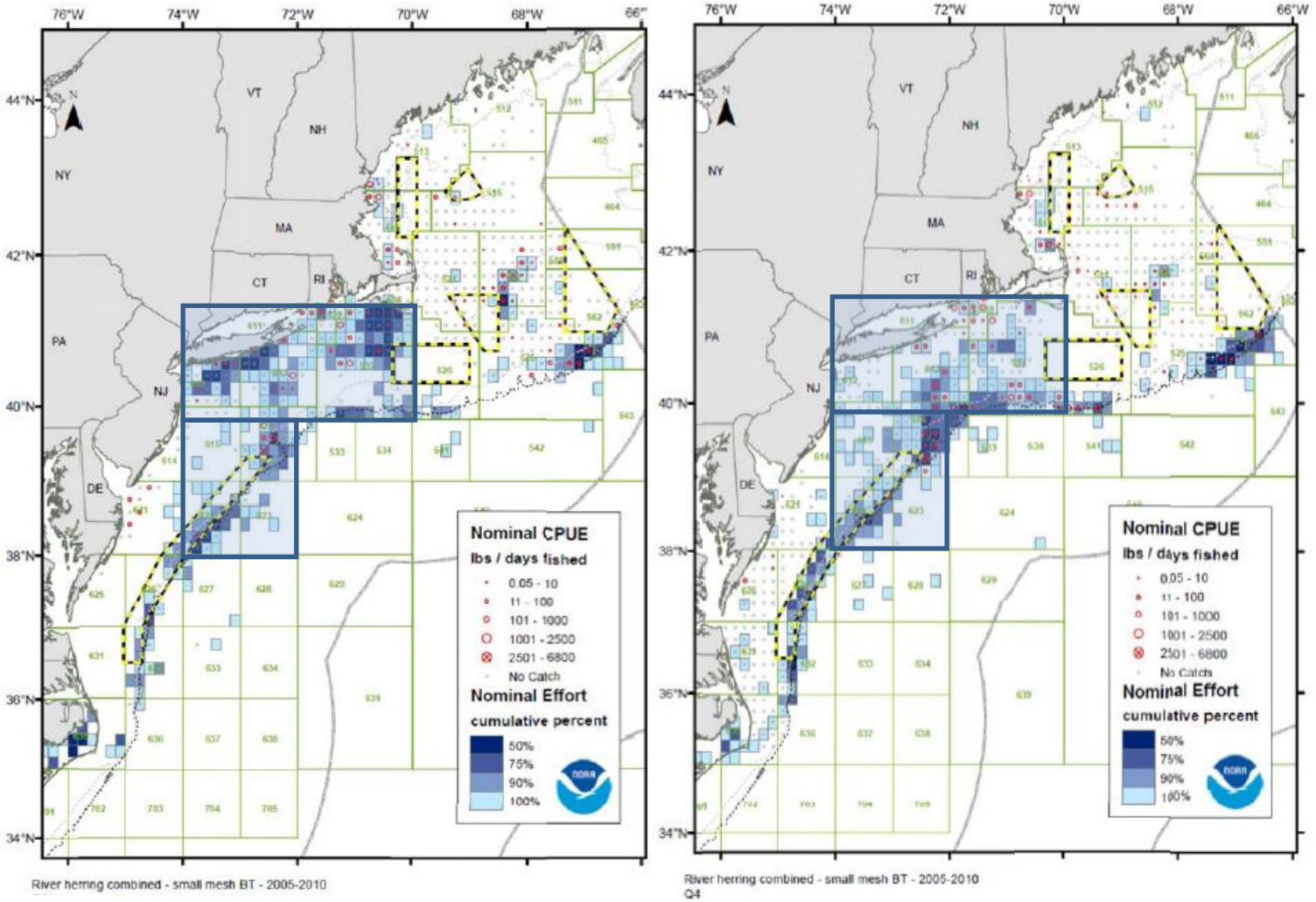


Figure 1. RH/S Mackerel Management Area (would apply in Quarter 1 only) over Quarter 1 MWT effort and RH/S Catch



Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 1 (left) and 2 (right) for 2005-2010.

Figure 2. RH/S Longfin squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 1 and 2)



Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 3 (left) and 4 (right) for 2005-2010.

Figure 3. RH/S Longfin squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 3 and 4)

2.1.8 Alternative Set 8 – Hotspot Restrictions

Background/Statement of Problem/Need for Action:

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements

The Council originally hoped to include some alternatives that would restrict fishing in relatively small areas that appeared to be "hotspots" for RH/S catch. The Amendment's Fishery Management Action Team's found that small-area management is unlikely to be successful (see Appendices 1 & 2). However, the New England Fishery Management Council's Amendment 5 to the Atlantic Herring FMP is considering small area "hotspot" alternatives. While Amendment 5 concluded that low positive impacts would result from the hotspot alternatives, it also noted that catch rates could increase outside of the hotspot areas which would seem to mirror the conclusions of the FMAT for Amendment 14 regarding the problems with small area management.

Regardless, to allow for potential coordination between this Amendment and Amendment 5 to the Atl. Herring FMP, the hotspot alternatives have been included as alternatives that would apply to mackerel and/or longfin squid fishing. Also, Since Atlantic herring and mackerel are often targeted by the same vessels and are sometimes targeted together at the same time, it makes sense to consider these alternatives even though they were based on observer data from "herring trips" as defined below.

The smallest areas are termed "River Herring Protection Areas." These Protection Areas were 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 during the respective 2-month period. The protection areas include just the portion of the monitoring/avoidance areas (described below) that have the highest river herring catches on Atlantic herring trips as defined above. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Protection Area versus other areas in a given year.

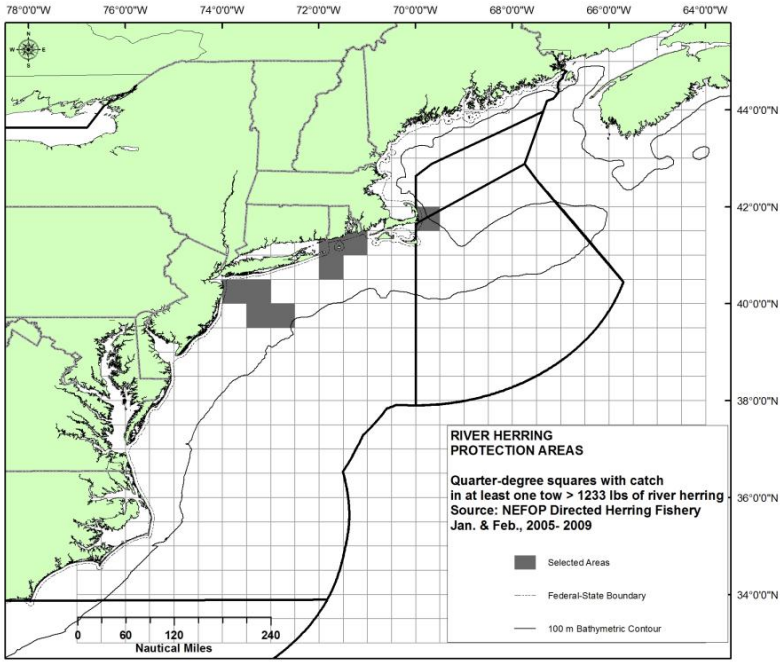
Slightly larger areas are termed "River Herring Monitoring/Avoidance Areas." These Monitoring/Avoidance Areas were identified bimonthly as the quarter degree squares with at least one observed tow of river herring catch greater than 40 pounds, using 2005-2009 Northeast Fisheries Observer Program data from trips with greater than 2,000 pounds of kept Atlantic herring during the respective 2-month period. They include all of the area identified in the protection areas as well is areas where a more modest amount of river herring was caught. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Monitoring/Avoidance Areas versus other areas in a given year.

These protection and monitoring/avoidance areas are mapped below by their respective bi-monthly periods. Since seeing them on the same page clarifies the differences among the areas,

they are illustrated together below (where applicable). Management measures that could apply to these areas follow the maps.

Figure 4. <u>January – February Herring Areas</u>

<u>Protection Area (highest catch records from Monitoring/Avoidance Area)</u>



<u>Monitoring/Avoidance Area</u>

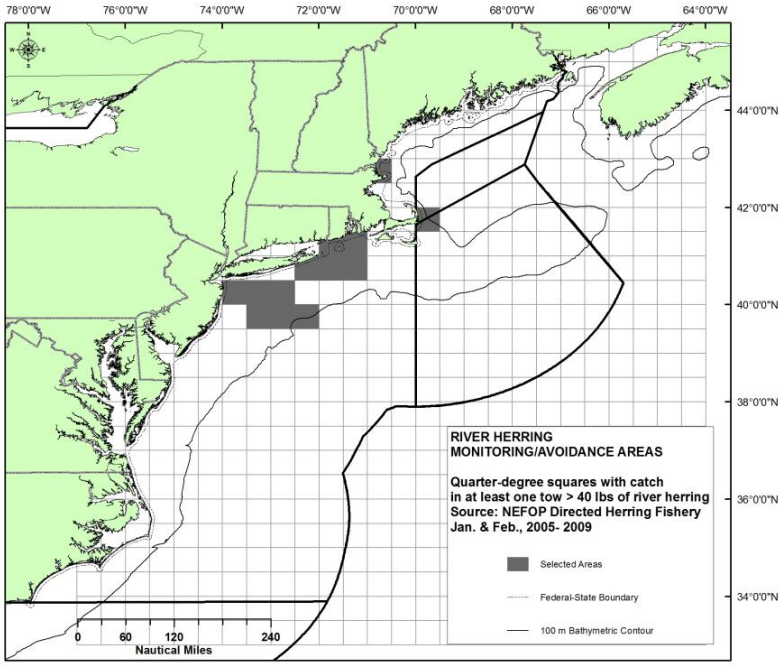
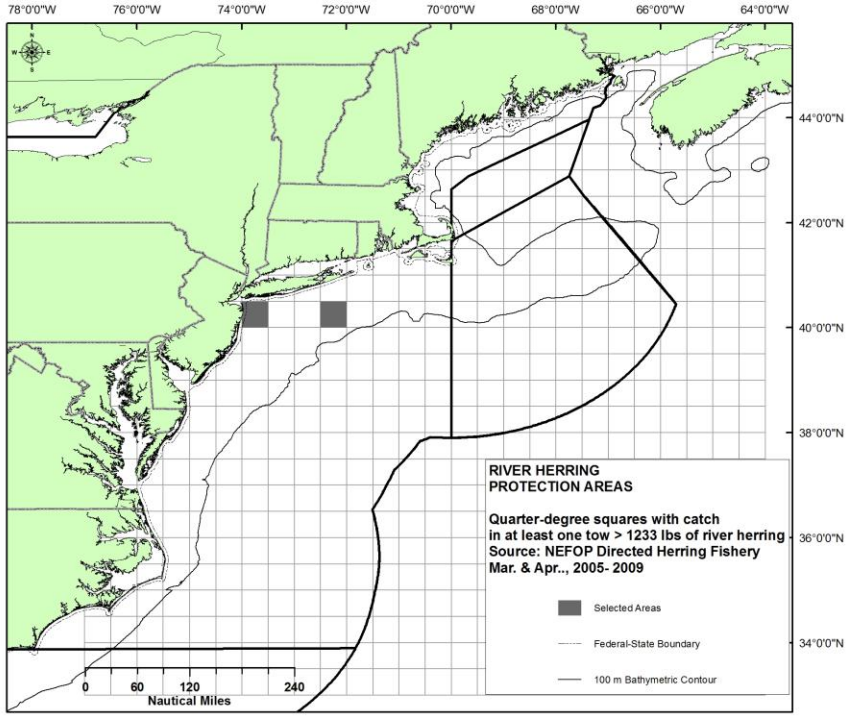


Figure 5. **March – April** Herring Areas

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

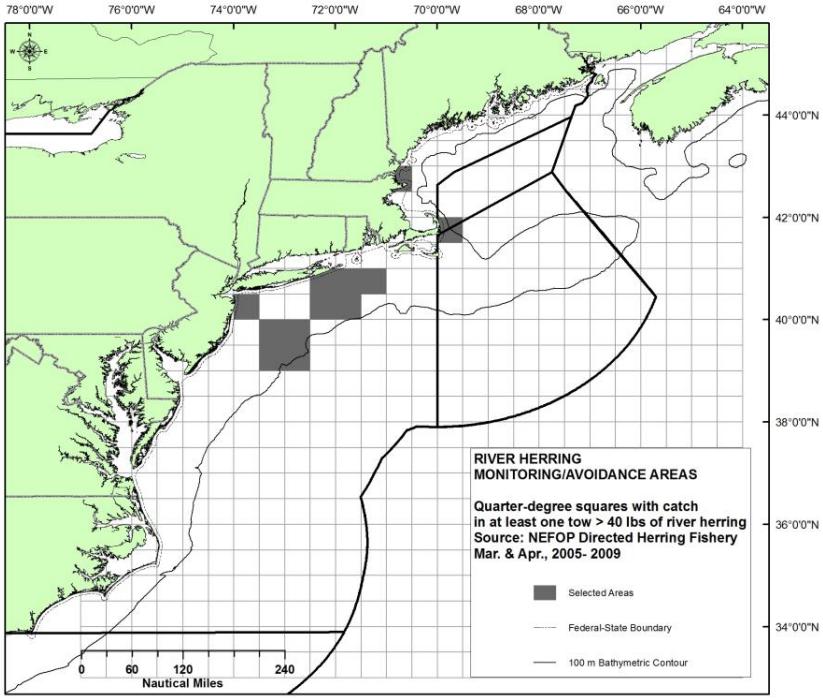


Figure 6.**May – June** Herring Areas

Protection Area

None proposed – there were no qualifying observer records (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).

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Monitoring/Avoidance Area

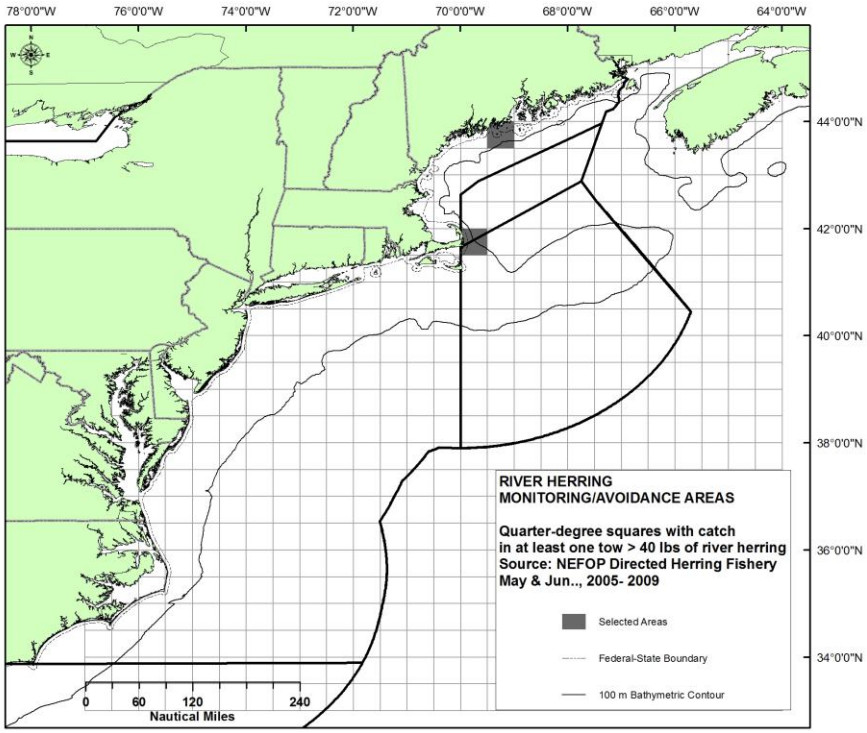

Figure 7. July – August **Herring Areas**

Protection Area

None proposed – there were no qualifying observer records (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).

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Monitoring/Avoidance Area

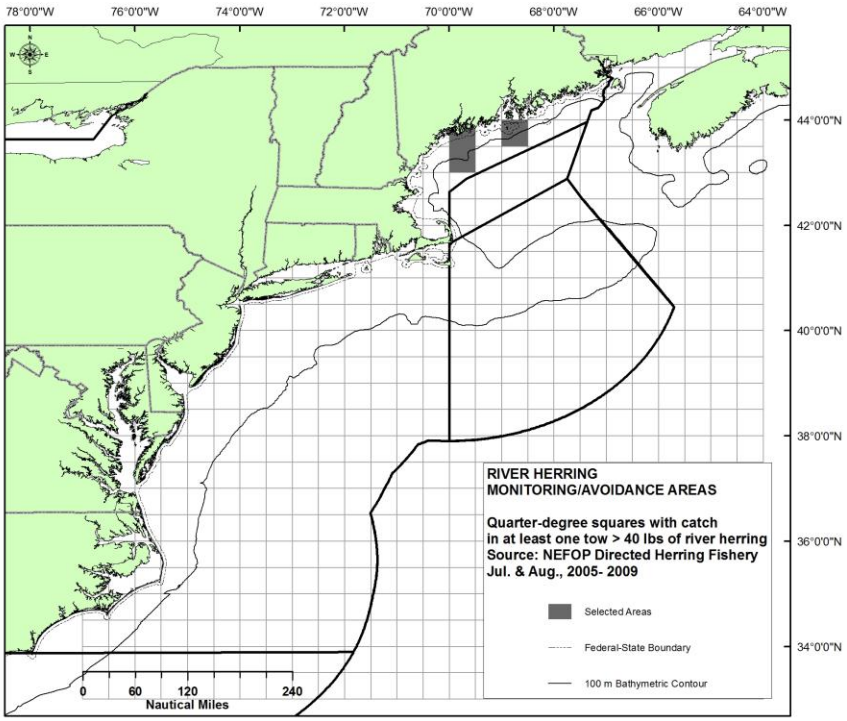
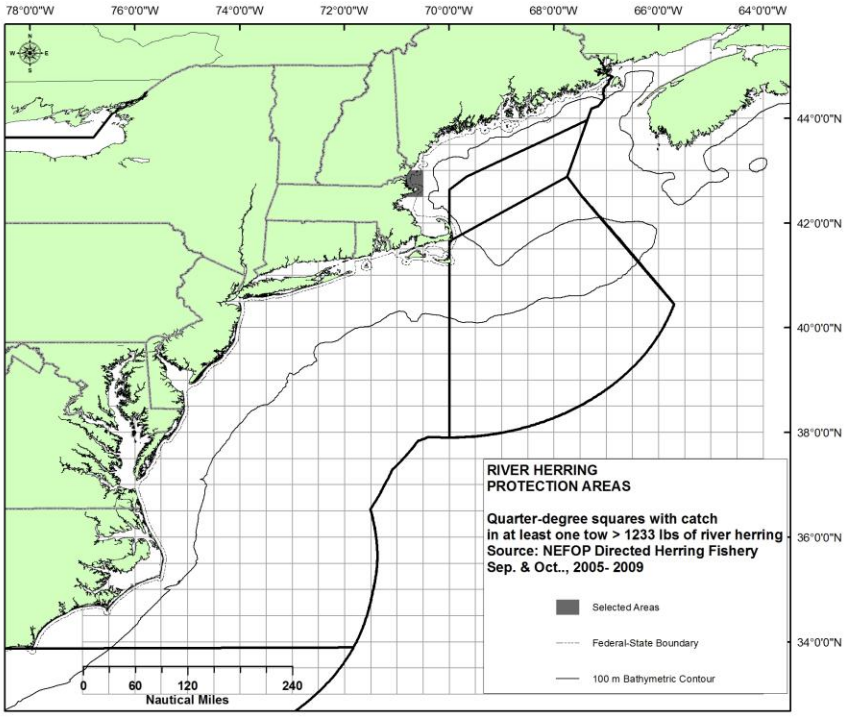


Figure 8.<u>September – October **Herring Areas**</u>

<u>Protection Area (highest catch records from Monitoring/Avoidance Area)</u>



<u>Monitoring/Avoidance Area</u>

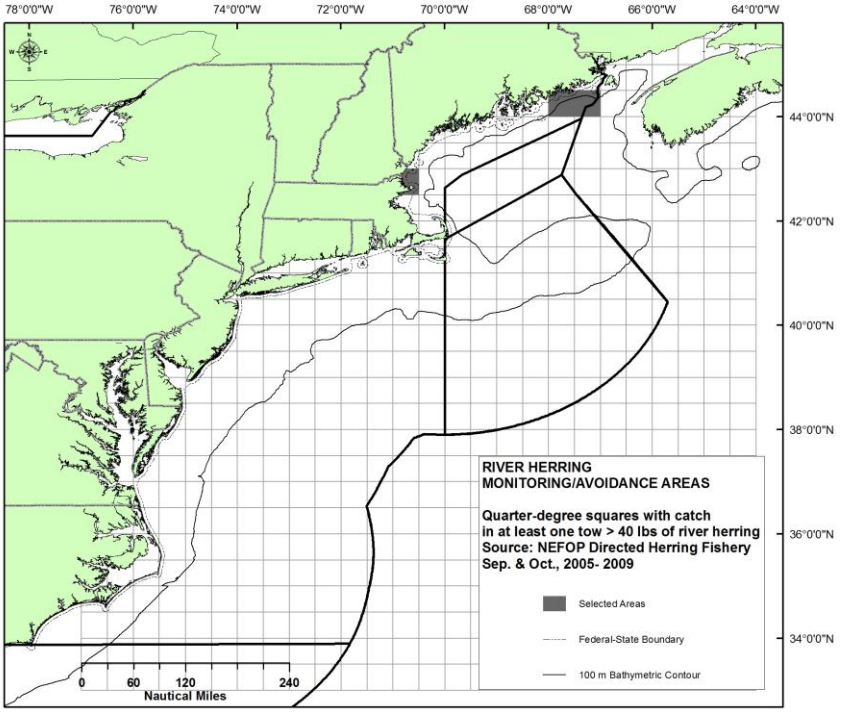
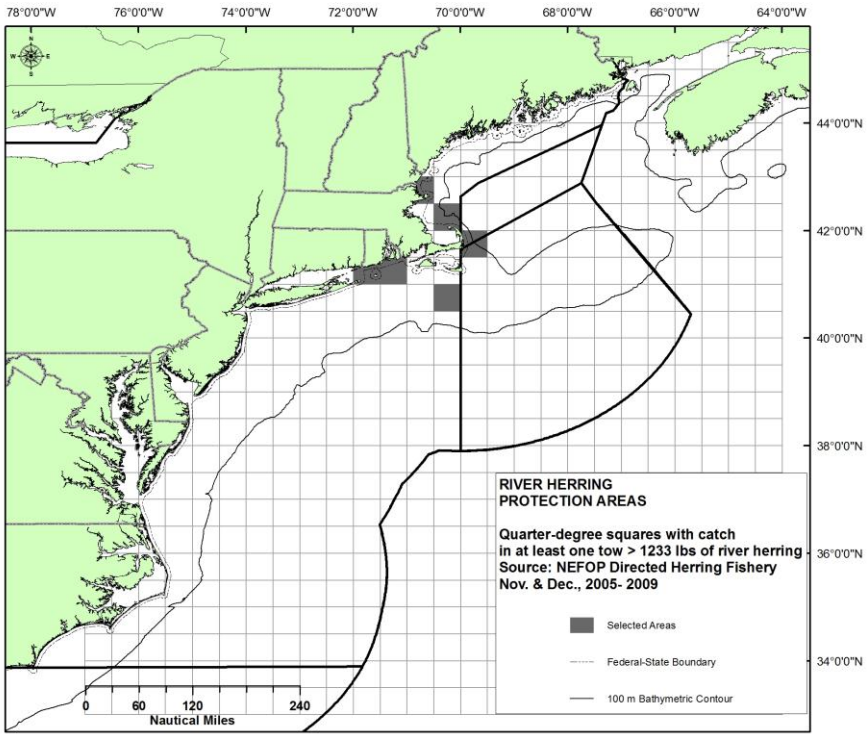
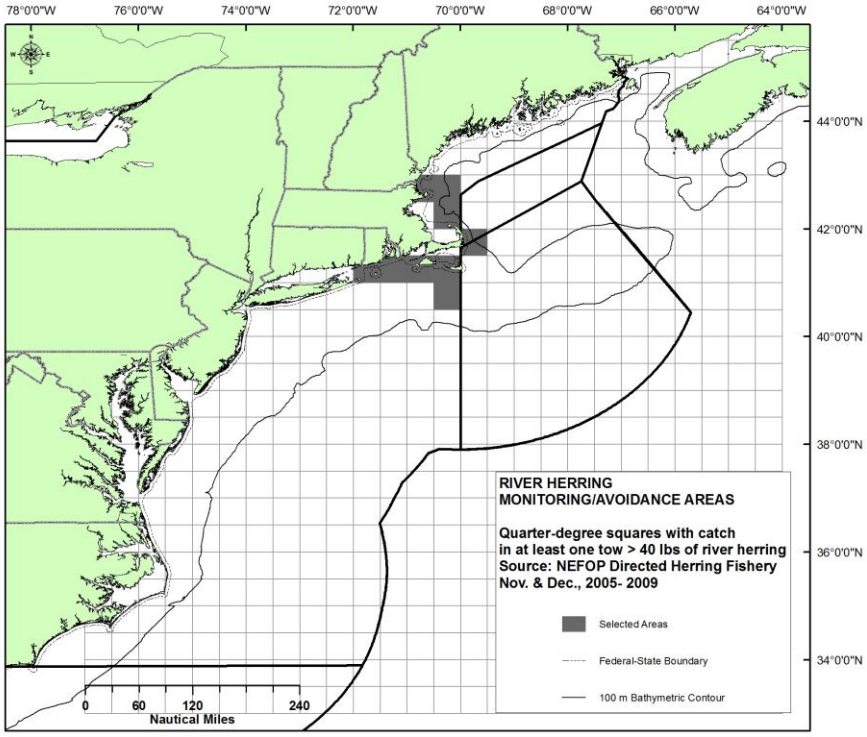


Figure 9. November – December **Herring Areas**

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area



Management Measures

For the areas described above a variety of management measures are being considered. A summary of the key biological and human community impacts (detailed in section 7) follows. Related to the FMAT findings that small, inter-annually fixed "hotspot" closures are unlikely to be effective, the impacts for all of the alternatives are the same and are described after all of the potential alternatives are described.

NOTE ON COMBINATIONS: All of the action alternatives in the set could be adopted individually or together. 8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (8cMack and 8cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

If an overall observer coverage requirement in Alternative Set 5 was selected but did not result in a trip covered by an alternative in this Alternative Set having an observer, this Alternative Set would effectively require additional coverage.

NOTE: Due to their similar likely impacts, all impacts for the action alternatives in this Alternative Set are summarized below 8f.

8a. No-action

If this alternative is selected, then no measures from Alternative Set 8 would be implemented and the existing state management measures (as described in section 5.9) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below.

8b. Make implementing area-based "hotspot closures" to reduce catches (similar to those considered in NEFMC's Amendment 5 to the Atlantic Herring Plan) frameworkable. (PREFERRED)

The wording of this alternative has been modified from the DEIS to clarify the Council's intent but the substance of the alternative has not changed.

The Council would make the hotspot requirements considered below frameworkable under a subsequent action. Biological and Socioeconomic considerations would be reevaluated when the framework was developed. No immediate impacts would be expected. Any potential follow-up actions would be subsequently analyzed and considered separately.

8cMack. For Atlantic mackerel permitted vessels, more than an incidental level of fish (20,000 pounds mackerel) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

8cLong. For longfin squid permitted vessels, more than an incidental level of fish (2,500 pounds longfin squid) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

8dMack. If a mackerel-permitted vessel is fishing in any River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 non-target 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.

8dLong. If a longfin squid-permitted vessel is fishing in a River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 non-target 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.

8eMack. Vessels possessing a federal mackerel permit would not be able to retain, possess or transfer more than an incidental level of fish (20,000 pounds mackerel) while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel.

8eLong. Vessels possessing a federal moratorium longfin squid permit would not be able to retain, possess or transfer 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.

8f. Make the above measures 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong only effective if/when they are effective for Atlantic Herring vessels, including if they become effective in the middle of a season because a catch-cap based trigger is reached by the Atlantic Herring fleet under a trigger established by Amendment 5 to the Atlantic Herring FMP.

Summary of Biological Impact Analysis

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to these alternatives, it would not be expected that over time the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide and variable distribution of most non-target species including RH/S. RH/S catch may be decreased inside the hotspot but increase outside the hotspot. This is consistent with the findings of the FMAT analyses detailed in Appendices 1 and 2.

Summary of Socio-Economic Impact Analysis

A low negative impact would be expected compared to the no-action alternative. Given the complexity of fishermen's responses to regulations and given the protection areas are relatively small, the effects may be negligible for most fishermen in most years compared to the no-action alternative (they will fish other areas around the hotspots). However, near-shore fishermen near the closed areas may be disproportionately impacted by closures around their home port.

2.2 Impacts Summaries

Section 2.2 summarizes the impacts of the alternatives. First the impacts of the preferred alternatives are summarized by the two purposes of the Amendment and then impacts of all considered alternatives are summarized qualitatively in tabular form.

Purpose A: "**Implement Effective RH/S Catch Monitoring**" – Purpose A is to consider alternatives that would implement monitoring programs for the Mackerel, Squid, and Butterfish (MSB) fisheries that are sensitive enough and robust enough to the spatial and temporal variability of RH/S distributions so that good RH/S catch estimates can be generated.

The preferred alternatives in alternative sets 1-5 together are designed to be integrated with existing monitoring and reporting requirements to create an overall complementary system that provides accurate data on the catch of RH/S in the mackerel and longfin squid fleets. Thus the preferred alternatives cannot be compared to each other in terms of one being more or less important for RH/S conservation since they will function as a unit. Each preferred alternative will add incremental information about RH/S catch and thus provide incremental benefits in terms of better data to perform assessments and guide management.

The preferred alternatives would: require weekly VTR reporting for all MSB vessel permits (1c); require a 48-hour pre directed mackerel trip notification (1d48); require VMS and daily VMS catch reporting for mackerel and longfin squid vessels (1eMack, 1eLong, 1fMack, and 1fLong); and require a 6-hour pre-landing notification via VMS for mackerel landings greater than 20,000 pounds (1gMack). The preferred alternatives would also require federal MSB dealers to weigh all landings of mackerel over 20,000 pounds (2d) and longfin squid over 2,500 pounds (2f) or document why they cannot weight landings (2g). (If all fish are not weighed separately, dealers would have to document with each transaction how they estimate the relative composition of mixed catches.). The preferred alternatives would also require for mackerel and longfin-butterfish permits that: reasonable assistance be provided to observers (3b); notice of haul-back or pumping be provided to observers (3c); one observer is provided for each vessel on pair-trawl operations whenever possible (3d). Unless safety, mechanical, or spiny dogfish issues make it inappropriate, the same vessels would not be able to release hauls of fish ("slippage") prior to observer documentation, and catch affidavits would have to be completed for any pre-observed net release (3j). For mackerel limited access vessels, there would also be a fleet-wide cap of 10 non-emergency (safety, mechanical, spiny dogfish) slippages after which further non-emergency slippages would require a vessel to terminate their trip (3l). The Council also made implementation of additional portside monitoring and catch avoidance based on portside monitoring frameworkable (4f). The Council recommended 100% observer coverage of mid-water trawl (MWT) mackerel trips (5b4) as well as tiered coverage levels for small mesh bottom trawl mackerel trips (100% for Tier 1, 50% for Tier 2, and 25% for Tier 3) (5c4) along with requiring mackerel vessels to pay $325 when they carry observers to help fund the desired coverage levels (5f). Coverage levels would be re-evaluated after 2 years (5h).

Taken together, and when combined with existing reporting and monitoring requirements, these measures should allow for accurate estimates of RH/S catch in the MSB fisheries (most RH/S catch in the MSB fisheries occurs in the mackerel fishery). While not directly impacting RH/S stocks, better catch data should help improve RH/S assessments and management indirectly. All of these alternatives should have relatively small impacts on the MSB fisheries except the observer coverage provisions, which could add $325/day in costs for mackerel fishing.

Purpose B: "**Reduce RH/S Catch**" – Purpose B is to consider alternatives to reduce catch of RH/S in the MSB fisheries. The MSA requires Councils to minimize discards to the extent practicable (Section 301 – National Standard 9) and provides discretionary authority to "include management measures in the plan to conserve…non-target species…considering the variety of ecological factors affecting fishery populations" (Section 303(b)(12)).

Alternative sets 6, 7, and 8 examined measures to reduce catch of RH/S in the mackerel and longfin squid fisheries. Since RH/S catch is greatest in the mackerel fishery, and current analysis suggested that area-based could not be determined to be an effective measure, the Council recommended mortality caps for RH/S on the mackerel fishery (6b and 6c) and added future mortality caps and hotspot closures as frameworkable actions (6f and 8b respectively). The impact of 6b and 6c will depend on what the cap is ultimately set at, and the cap will be set and analyzed through the annual specifications process. If a cap is set relatively high then status-quo fishing should continue and status-quo impacts on RH/S would also likely continue. If a cap is set relatively low then less fishing may occur, which would mean less mortality related to fishing but the overall impact on RH/S stocks is unquantifiable (could be unsubstantial or substantial) given the information presented in the most recent assessment.

Overview of Measures Table

Table 8 provides a concise general summary of the measures and their anticipated effects. The combined effects of the preferred alternatives related to the purposes of this Amendment are described above. For all Alternative Sets (1-8) and all valued ecosystem components (VECs), the first alternative ("a") equals no-action, which is what is predicted to happen with the status quo management measures. Subsequent alternatives are the action alternatives and diverge from the status quo management measures as described in Section 5. The impact analysis focuses on the valued ecosystem components (VECs) that were identified for Amendment 14 and described in detail in Section 6.0 of this document. These VECs include (see next page):

VECs:

1. Managed Resources
   - Atlantic mackerel stock
   - *Illex* stock
   - Longfin squid stock
   - Atlantic butterfish stock
2. Non-target species
   -Non-Target species include river herrings (blueback and alewife) and shads (American and hickory), collectively referred to as RH/S. Given the lack of information on how these species travel and mix in the ocean, different impacts are generally not discernible between these species but are noted where appropriate (for example in caps that are placed on particular species)
3. Habitat including EFH for the managed resources and non-target species
4. Endangered and other protected resources
5. Human Communities

While in previous MSB FMP EISs the impacts from all alternatives are grouped together for each VEC, with the large number of alternatives in this amendment (about 80), the result would that one would start with managed resources, have ~80 associated impacts, then have ~80 impacts for non-target species, and so on with the other VECs. That format seemed to lead to a disconnect in evaluating each alternative in terms of its overall positive and negative impacts across different VECs. As a result, the impact analysis in this EIS proceeds alternative by alternative with impacts for each VEC described for a given alternative before moving on to the next alternative's impacts.

In these tables, a variety of terms (e.g. positive or negative) have specific meanings for each VEC and are described below. These are the same as are used in the impact analysis section, Section 7.

Managed Species, Non-Target Species, Protected Species:

Note: Often impacts are indirect in that an action may change overall effort, which would decrease impacts if effort goes down or increase impacts if effort goes up.

Neutral/negligible: actions that are expected to have no discernible impact on stock/population size. The table below uses just "negligible" to save space.
Positive: actions that increase stock/population size
Negative: actions that decrease stock/population size

Habitat:

Note: Often impacts are indirect in that an action may change overall effort, which would decrease impacts if effort goes down or increase impacts if effort goes up.

Neutral/negligible: actions that are expected to have no discernible impact on habitat. The table below uses just "negligible" to save space.
Positive: actions that improve the quality or reduce disturbance of habitat
Negative: actions that degrade the quality or increase disturbance of habitat

Human Communities:

Neutral/negligible: actions that are expected to have no discernible impact on human communities. The table below uses just "negligible" to save space.
Positive: actions that increase revenue and well-being of fishermen and/or associated businesses
Negative: actions that decrease revenue and well-being of fishermen, associated businesses, or other interested parties.
Mixed: The action would create benefits for some and costs for others. Generally there are costs to MSB fishery participants but potential benefits to other fishermen (commercial or recreational) or other interested parties who value MSB or RH/S resources. Since the linkages between catches in MSB fisheries and RH/S resources is not known, it is generally uncertain regarding which would be greater, costs to current MSB participants or benefits to other interested parties.

Impact Qualifiers:

The following qualifiers are also used in the impact analysis:

Low (as in *low* positive or *low* negative): to a lesser or small degree
High (as in *high* positive or *high* negative) to a greater or large degree
Potentially: A relatively higher degree of uncertainty is associated with the impact. Often this qualifier is used when an action may lead to better data, but future actions would have to actually use that data in decision making in order for there to be a concrete benefit.

If impacts are expected to be isolated to a particular species, usually either mackerel, longfin squid, *Illex* squid, butterfish, or river herrings and shads (RH/S) then this fact will be noted as well.

To some the extent the operation of the MSB fisheries may currently be negatively affecting the directed fisheries, RH/S stocks, other non-target species, habitat, and protected resources compared to if there was no fishery. However the fisheries exist currently, so their continued operation under "no-action" would result in similar impacts as occur presently. As such, all comparisons in Table 8 are in reference to changes from the no-action alternative but Section 7 also discusses how the no-action alternative may compare to the action alternatives.

Table 8. Alternative Impact Summary Table

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
1a No Action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
1bMack mackerel weekly VTRs	Potentially Low Positive - better monitoring	Potentially Low Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1bLong longfin weekly VTRs	Potentially Low Positive - better monitoring	Potentially Low Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1c MSB weekly VTRs	Potentially Low Positive - better monitoring	Potentially Low Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1d48 48hr notice for mackerel trips	Potentially Low Positive - better observer placement	Positive - better observer placement	Negligible - no substantial change in effort expected	Potentially Positive - better observer placement	Mixed (positive and negative impacts for different interests)
1d72 72hr notice for mackerel trips	Potentially Low Positive - better observer placement	Positive - better observer placement	Negligible - no substantial change in effort expected	Potentially Positive - better observer placement	Mixed (positive and negative impacts for different interests)
1eMack VMS for mackerel vessels	Potentially Low Positive - better monitoring	Potentially Positive - better monitoring	Negligible - no substantial change in effort expected	Potentially Positive - supports area closures	Mixed (positive and negative impacts for different interests)
1eLong VMS for longfin vessels	Potentially Low Positive - better monitoring	Potentially Positive - better monitoring	Negligible - no substantial change in effort expected	Potentially Positive - supports area closures	Mixed (positive and negative impacts for different interests)
1fMack VMS reporting for mackerel	Potentially Low Positive - better monitoring	Potentially Low Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1fLong VMS reporting for longfin	Potentially Low Positive - better monitoring	Potentially Low Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1gMack 6hr pre-land VMS for mackerel	Potentially Low Positive - better monitoring	Potentially Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
1gLong 6hr pre-land VMS for longfin	Potentially Low Positive - better monitoring	Potentially Positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
2a No Action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
2b Vessel SAFIS Confirmation	Low positive - better record keeping	Low positive - better record keeping	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Potentially Low Positive - better record keeping
2c mackerel catch weighing with annual sorting documentation	Low positive - better monitoring	Low positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
2d mackerel catch weighing with sort doc for each transaction	Low positive - better monitoring	Low positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
2e longfin catch weighing with annual sort doc	Low positive - better monitoring	Low positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
2f longfin catch weighing with sort doc for each transaction	Low positive - better monitoring	Low positive - better monitoring	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
2g Allow volume to weight conversions	Neutral - equivalent to status quo	Neutral - equivalent to status quo	Neutral - equivalent to status quo	Neutral - equivalent to status quo	Neutral - equivalent to status quo

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
3a No action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
3B reasonable assistance	Low Positive - improves observer data	Low Positive - improves observer data	Negligible - no substantial change in effort expected	Low Positive - improves observer data	Neglible
3c pump/haul notice	Low Positive - improves observer data	Low Positive - improves observer data	Negligible - no substantial change in effort expected	Low Positive - improves observer data	Neglible
3d paired observers	Low Positive - improves observer data	Low Positive - improves observer data	Negligible - no substantial change in effort expected	Low Positive - improves observer data	Neglible
3e slippage reports	Low Positive - improves observer data	Low Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Neglible
3f no discards before sampling mackerel	Low Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3g no discards before sampling longfin	Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3h 1 slip termination	Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3i 2 slip termination	Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3j Closed Area 1 Rules	Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3k 5 annual mackerel slips then trip termination for if more	Low Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3l 10 annual mackerel slips then trip termination for if more	Low Positive - improves observer data	Positive - improves observer data	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts (cont)				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
3m 5 trimester longfin slips then trip termination for if more	Positive - improves observer data	Positive - improves observer data	Neglible - no substantial change in effort expected	Neglible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3n 10 trimester longfin slips then trip termination for if more	Positive - improves observer data	Positive - improves observer data	Neglible - no substantial change in effort expected	Neglible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3o repeat observers for canceled trips	Low Positive - improves observer data	Low Positive - improves observer data	Neglible - no substantial change in effort expected	Neglible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
3p individual vessel slippage quota	Potential Positive - improves observer data	Potential Positive - improves observer data	Neglible - no substantial change in effort expected	Neglible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
4a No Action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
4b port-side sampling for mackerel landings	Neglible - landings already well monitored	Positive - better landings data for non-targets	Negligible - fishery mostly uses MWT	Potentially positive - may lower effort.	Mixed (positive and negative impacts for different interests)
4c portside sampling for longfin landings	Neglible - landings already well monitored	Neglible - most non-target catch is discarded at set	Potentially positive - may lower effort.	Potentially positive - may lower effort.	Mixed (positive and negative impacts for different interests)
4d Tier 3 mackerel hold certification	Neglible - landings already well monitored	Potentially low Positive - better data for non-targets	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
4e longfin hold certification	Neglible - landings already well monitored	Potentially positive - better data for non-targets	Negligible - no substantial change in effort expected	Negligible - no substantial change in effort expected	Mixed (positive and negative impacts for different interests)
4f Sust. Fish. Coalition frameworkable	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action

(continued)

Management Measures	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
5a No action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
5b Observer coverage for mackerel MWT	Potentially low positive - better discard data	Positive - better incidental catch data	Negligible - fishery mostly uses MWT	Negligible (positive if industry has to pay which would decrease effort)	Mixed (positive and negative impacts for different interests)
5c Observer coverage for mackerel SMBT	Potentially low positive - better discard data	Positive - better incidental catch data	Negligible (positive if industry has to pay which would decrease effort)	Negligible (positive if industry has to pay which would decrease effort)	Mixed (positive and negative impacts for different interests)
5d Observer coverage for longfin SMBT	Positive - better discard catch data	Positive - better incidental catch data	Negligible (positive if industry has to pay which would decrease effort)	Negligible (positive if industry has to pay which would decrease effort)	Mixed (positive and negative impacts for different interests)
5e Strata-Fleet-Based Alternatives	Positive - better discard catch data	Positive - better incidental catch data	Negligible (positive if industry has to pay which would decrease effort)	Negligible (positive if industry has to pay which would decrease effort)	Mixed (positive and negative impacts for different interests)
5f Industry Funding	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Mixed (positive and negative impacts for different interests)
5g phased industry funding	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Negligible but tied to 5b-5e above.	Mixed (positive and negative impacts for different interests)
5h 2-year coverage re-evaluation	NA - describes future action	NA - describes future action	NA - describes future action	NA - describes future action	NA - describes future action

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
6a No Action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
6b Mackerel River Herring Cap	Potentially low positive - lower catch	Potentially positive - lower catch depending on cap amount	Negligible - fishery mostly uses MWT	Potentially positive - lower effort depending on cap amount	Mixed (positive and negative impacts for different interests)
6c Mackerel Shad Cap	Potentially low positive - lower catch	Potentially positive - lower catch depending on cap amount	Negligible - fishery mostly uses MWT	Potentially positive - lower effort depending on cap amount	Mixed (positive and negative impacts for different interests)
6d Longfin River Herring Cap	Potentially positive - lower catch (butterfish)	Potentially positive - lower catch depending on cap amount	Potentially positive - lower effort depending on cap amount	Potentially positive - lower effort depending on cap amount	Mixed (positive and negative impacts for different interests)
6e longfin shad cap	Potentially positive - lower catch (butterfish)	Potentially positive - lower catch depending on cap amount	Potentially positive - lower effort depending on cap amount	Potentially positive - lower effort depending on cap amount	Mixed (positive and negative impacts for different interests)
6f Make Caps Frame-workable	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
7a No Action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
7bMack Closed Area Mackerel	Potentially low positive - lower catch	Positive - lower effort/catch	Negligible - fishery mostly uses MWT	Positive - would reduce effort	Mixed (positive and negative impacts for different interests)
7bLong Closed Area Longfin	Potentially low positive - lower catch	Low Positive - lower effort/catch	Positive - would reduce effort	Positive - would reduce effort	Mixed (positive and negative impacts for different interests)
7cMack observer area mackerel	Potentially low positive - lower catch	Potentially positive (better observer data and/or lower effort)	Negligible - fishery mostly uses MWT	Positive - would reduce effort	Mixed (positive and negative impacts for different interests)
7cLong observer area longfin	Potentially low positive - lower catch	Potentially low positive (better observer data and/or lower effort)	Positive - would reduce effort	Positive - would reduce effort	Mixed (positive and negative impacts for different interests)
7d trigger option	Tied to 7b-7c. Would reduce impacts (positive or negative) because those measures would only be in place for part of year after trigger was reached.	Tied to 7b-7c. Would reduce impacts (positive or negative) because those measures would only be in place for part of year after trigger was reached.	Tied to 7b-7c. Would reduce impacts (positive or negative) because those measures would only be in place for part of year after trigger was reached.	Tied to 7b-7c. Would reduce impacts (positive or negative) because those measures would only be in place for part of year after trigger was reached.	Tied to 7b-7c. Would reduce impacts (positive or negative) because those measures would only be in place for part of year after trigger was reached.
7e Area Updating	Negligible - allows future action	Negligible - allows future action	Negligible - allows future action	Negligible - allows future action	Negligible - allows future action

(continued)

Management Measures	Valued Ecosystem Component (VEC) Impacts				
	Managed resource	Non-target species Esp. RH/S	Habitat including EFH	Protected Resources	Human Communities
8a No action	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo	Neutral - Status Quo
8b make hotspots frame- workable	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action	NA - allows future action
8cMack Observers in Monitoring/ Avoidance Area	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8cLong Observers in Monitoring/ Avoidance Area	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8dMack Closed Area 1 rules w/exit for slipping	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8dLong Closed Area 1 rules w/exit for slipping	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8eMack closure in protection area	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8eLong closure in protection area	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits
8f Tie alternative implemen-tation to Atl Herring	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Negligible - hotspots are too small given geo-temporal variability of fish and fishing	Low negative - possible costs to fishery without any conservation benefits

Note: The FMAT analysis (see Appendices 1 & 2) found that the small-area based "hotspot" alternatives considered in this Alternative Set are likely to just redistribute effort and that given the widespread distribution of RH/S the end result could be to increase impacts on RH/S just as easily as reducing impacts on RH/S and that one would not be able to predict the actual outcome.

2.3 Areas of Controversy

Many measures considered in this document have been controversial at least at some point in the development of the Amendment. The controversy generally hinges on three primary factors. They are: 1) the relatively high potential cost of some of the alternatives (especially industry-funded observer coverage [Set 5], mortality caps [Set 6] and large-scale area-based restrictions [Set 7]); 2) the concern by some segments of the public about the impacts of large scale trawling on river herring and shad populations; and 3) the lack of firm science (i.e. high uncertainty) about either the coast-wide populations of river herring and shad or about the impact on those populations from at-sea trawling versus other sources of mortality (natural or human-caused). The decision to effectively move consideration of whether to directly manage RH/S into Amendment 15 to the MSB FMP also caused some controversy but the Council ultimately decided a separate Amendment was the best vehicle to address the complicated issues raised by potentially adding RH/S as directly-managed species.

2.4 Considered but Rejected Management Actions

1. The Council decided not to add a provision for annual forage set-asides for mackerel, squids, and butterfish. Instead, the Council noted that the recent Omnibus Annual Catch Limit Amendment already allows harvest reductions due to forage concerns and concluded that formal set-asides would be better considered after the Council develops ecosystem level goals and objectives that are informed by the ongoing work of the ecosystem subcommittee of the Scientific and Statistical Committee.

2. The Council considered including consideration of catch shares for the squid fisheries during the scoping process but concluded that it would be more effective to focus Amendment 14 on river herring and shad issues. Also, there was strong public comment against including squid catch shares at the current time.

3. The Council considered requiring 6 hour pre-landing notification via phone to land more than 20,000 pounds of mackerel so as to facilitate quota monitoring. This was removed because NMFS is trying to phase out phone notifications of this kind.

4. The Council considered requiring 6 hour pre-landing notification via phone to land more than 2,500 pounds of longfin squid so as to facilitate quota monitoring. This was removed because NMFS is trying to phase out phone notifications of this kind.

5. The Council considered requiring daily electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed because other options seemed equally effective and the infrastructure for 24hr reporting is burdensome for both NMFS and dealers.

6. The Council considered requiring 48 hour electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed

because other options seemed equally effective and the infrastructure for 48hr reporting is burdensome for both NMFS and dealers.

7. The Council considered requiring 72 hour electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed because other options seemed equally effective and the infrastructure for 42hr reporting is burdensome for both NMFS and dealers.

8. The Council considered requiring trip termination following 3 slipped hauls on an observed trip so as to minimize slippage events. The goal is to minimize slippage events. This was removed because other options seemed equally effective (termination after 1 or 2 hauls) and having 3 slipped hauls on one trip would be a rare event.

9. The Council considered using mesh changes to reduce the catch of river herrings and shads but concluded such measures were not feasible due to the lack of trawl mesh selectivity for mackerel, river herrings, and shads. Selectivity information would be necessary to evaluate both potential benefits to river herrings and shads and potential costs to the relevant directed fisheries.

10. Some measures under consideration address slippage where the contents of a net on an observed haul on an observed trip are released in the water. In these cases the observer cannot sample the released catch. Some alternatives considered requiring ¼ of the catch to be pumped on board but these were rejected because a) catch may be patchy and only sampling ¼ of the net

11. To obtain information on fish that may remain in the net, the Council conserved alternatives that would require nets to be periodically brought aboard after pumping for sampling. These alternatives were rejected because the observer program had already begun such sampling at higher rates than those considered in the document. An alternative was also added to prohibit any discarding of un-sampled fish, even operational discards.

12. To consider broader RH/S conservation and management issues, the DEIS considered adding any or all RH/S species as directly managed "stocks in the fishery" within the MSB FMP.

The Council considered adding none, one, or any combination of the RH/S species as "stocks" in the fishery. Selecting any of the action alternatives would have resulted in the Council immediately beginning another amendment to add all of the required Magnuson provisions for an FMP. Based on guidance from NMFS and NOAA General Counsel, the Council chose to instead develop a separate amendment, Amendment 15, which would fully consider the complicated issues associated with potentially commencing Council management of RH/S. Further details are available in the DEIS, available at: http://www.nero.noaa.gov/regs/ under the 2012 "past action link," but generally the DEIS found that direct Council management impacts to RH/S would be expected to be positive for all relevant RH/S species and in approximately the same fashion but to an unknown degree given the various sources of RH/S mortality and limitations on RH/S productivity. Positive RH/S impacts were primarily related to: 1) potential additional federal support of RH/S management (assessments, FMP and specifications review, etc.); 2) additional coordination of conservation activities across agencies; 3) Essential Fish Habitat (EFH) designation and consultations; and 4) implementation of Annual Catch Limits (ACLs) and Accountability Measures (AMs).

The two key questions that will have to be answered by the Council in Amendment 15 are: 1) Is the current management framework is sufficient to conserve RH/S stocks; and 2) Can federal management by the Council substantially improve management of RH/S. The uncertainty regarding the current factors causing RH/S populations to remain in depressed states means that it will be difficult to identify specific causes and link remedies to specific outcomes. Given this, the extent of benefits from adding RH/S as stocks in the fishery will be difficult to quantify even though impacts are likely to be positive, but that will be the task of Amendment 15. The development of Amendment 15 has begun and may be tracked at the Council website: http://www.mafmc.org/, and then clicking through to the Mackerel-Squid-Butterfish section or by contacting Jason Didden at jdidden@mafmc.org (302-526-5254).

2.5 Regulatory Basis for the Amendment

Amendment 14 was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (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). The MSA requires Councils to minimize discards to the extent practicable (Section 301 – National Standard 9) and provides discretionary authority to "include management measures in the plan to conserve…non-target species…considering the variety of ecological factors affecting fishery populations" (Section 303(b)(12). How these provisions apply to RH/S catch in the mackerel and Longfin Squid fisheries is the primary concern of Am14 (see purposes A and B above). The MSA also provides for Councils to submit new fishery management plans for fish stocks, including anadromous species (see purpose C above).

NEPA requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as environmental impact statements (EISs). This document constitutes the EIS for the management measures currently under consideration and was prepared by the Council in consultation with the National Marine Fisheries Service (NMFS).

This document also addresses the requirements of the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Information Quality Act, 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 and/or 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 for these laws and executive orders including MSA and NEPA, and the information to ensure consistency with the applicable laws and executive orders.

3.0 LIST OF ACRONYMS AND ABBREVIATIONS

ABC	Allowable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
AM	Accountability Measure
ASMFC	Atlantic States Marine Fisheries Commission
ATGTRT	Atlantic Trawl Gear Take Reduction Team
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
C.V.	coefficient of variation
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DPS	Distinct Population Segment
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
FR	Federal Register
FEIS	Final Environmental Impact Statement
ICES	International Council for the Exploration of the Sea
ICNAF	International Convention of the Northwest Atlantic Fisheries
IOY	Initial Optimum Yield
ITQ	Individual Transferrable Quota
JV	Joint Venture
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSB	Mackerel, Squid, and Butterfish
MSY	Maximum Sustainable Yield
MT (or mt)	metric tons
MWT	Mid Water Trawl
NE	New England
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fishery Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NK	Not classified
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
RFF	reasonably foreseeable future
RFFA	Reasonably Foreseeable Future Actions
RH/S	River Herring and Shad
RSA	Research Set-Aside
RV	Research Vessel
SA	Some Activity
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBRM	Standardized Bycatch Reporting Methodology
SMBT	Small Mesh Bottom Trawl
SSC	Scientific and Statistical Committee
U.S.	United States
VEC	Valued Ecosystem Component
VMS	Vessel Monitoring System
VTR	Vessel Trip Report

4.0 INTRODUCTION AND BACKGROUND

4.1 PROBLEMS/NEEDS FOR ACTION AND CORRESPONDING PURPOSES AND BACKGROUND

Table 9 summarizes the Problems/Needs for Action and corresponding purposes. The "Problem/Need for Action" describes 'Why is the Council taking a given action?' For each Problem/Need for Action there is a "Corresponding Purpose," which is how the Council proposes to address the Problem/Need for Action. Additional details on the purposes are provided after the table. The alternatives described in this document provide a reasonable range of specific tools to implement the purpose, i.e. solve the problem.

Table 9. Summary of the problems/needs for actions and purposes.

SUMMARY OF THE PURPOSE AND NEED FOR THE ACTION		
	PROBLEM/NEED FOR ACTION	CORRESPONDING PURPOSE
Purpose A	There is insufficient Monitoring of RH/S catch	Implement Effective RH/S Monitoring
Purpose B	catches may be negatively impacting RH/S	Reduce RH/S Catch
Purpose C	Insufficient management framework for RH/S	Consider RH/S NS1 Stock Issues

4.1.A Purpose A - Implement Effective RH/S Monitoring

While current levels of monitoring, especially at-sea observer coverage, document that RH/S are caught in the mackerel and longfin squid fisheries, the current relatively low monitoring levels do not allow for management to precisely understand how much RH/S different fisheries are catching. This makes it difficult to determine what, if any actions would be appropriate by the Council. Accordingly, this Amendment considers a variety of alternatives to improve monitoring.

The state of knowledge regarding RH/S catch given the current information is contained in Appendix 2. Given the purpose of Amendment 14, new analyses for Amendment 14 centered on River Herrings and Shads. The methods, detailed in Appendix 2, utilized ratios of observed caught RH/S to total observed fish kept (fish to be landed). These ratios were then applied to landings by year/area/quarter/gear/mesh strata to estimate RH/S catch for each strata. A similar procedure has become standard to estimate discards, but in that case only discards are used to establish the ratio. These strata were used to eliminate the ambiguity (e.g. double counting trips that land multiple species or missing directed effort that failed to catch the intended target) that

results from attempting to sort observer data by "directed trips" and is further discussed in Appendix 3, which describes the FMAT's recommendations upon reviewing the analysis. The detailed results of these analyses are also provided in Appendix 2 and summarized in Section 6.3.

Readers who participated in the process may note that the total catch estimates in Appendix 2 differ from some preliminary calculations discussed in early technical meetings. The differences are accounted for by three additional stratifications in the final analysis: 1) single and pair trawl estimates were combined in the early versions and estimated separately in the final analysis; and 2) bottom trawl estimates were combined in the early versions and estimated separately by mesh size in the final analysis; and 3) gillnet estimates were combined in the early versions and estimated separately by mesh size in the final analysis. The stratifications are described in detail in Appendix 2 but the general idea is that activity by like groups of gears should be estimated together, and there were differential catch rates between the selected stratifications.

4.1.B Purpose B: Reduce RH/S Catch

While acknowledging substantial uncertainty, the figures used by the council to develop Amendment 14 (see Appendix 2) are based on 2006-2010 data. The resulting estimates indicate that on average, about 960,000 pounds of river herrings and about 120,000 pounds of shads were caught in ocean intercept fisheries during each of those years. Ocean-intercept fish often are juveniles, so, if you assume five fish per pound, these numbers translate into around 5 million river herrings and 600,000 shads being caught each year on average. The data suggest that the mackerel and longfin squid fisheries account for a portion of this total catch and that the mackerel fishery may have substantial encounters with river herrings in some years.

Since there are no coast-wide stock assessments for river herrings or shads, it is not possible to determine if these catch levels are, or are not, detrimental to river herring or shad stocks. There also are concerns that single large catches of river herrings and shad could severely impact individual river runs, but very little is known about the mixing of fish runs at sea. Lack of comprehensive assessments makes it difficult to even ascertain the status of RH/S stocks. However, a variety of indicators and recent assessments suggest that many river runs have been in decline, probably for a variety of reasons.

Regardless of the status of RH/S stocks, National Standard 9 of the MSA requires that conservation and management measures, to the extent practicable, minimize discards, and to the extent that discards cannot be avoided, minimize the mortality of such discards. Both NMFS online guide to the 1996 Amendments to the MSA (available at: http://www.nmfs.noaa.gov/sfa/sfaguide/) and responses to comments in the National Standard Guidelines Final Rule published in the Federal Register in 1998 (available at: http://www.epa.gov/fedrgstr/EPA-GENERAL/1998/May/Day-01/g11471.htm) note that there is legislative history suggesting that for the sole purpose of discard/discard mortality minimization, this provision was intended so that Councils make reasonable efforts to reduce discards, but was neither intended to ban a type of fishing gear nor to ban a type of fishing or impose costs on fishermen and processors that cannot be reasonably met.

The meaning of "practicable" was also discussed in Conservation Law Foundation v. Evans, 360 F.3d 21, 27-28 (1st Cir. 2004). The court stated:

> *…the plaintiffs essentially call for an interpretation of the statute that equates "practicability" with "possibility," requiring NMFS to implement virtually any measure that addresses EFH and bycatch concerns so long as it is feasible. Although the distinction between the two may sometimes be fine, there is indeed a distinction. The closer one gets to the plaintiffs' interpretation, the less weighing and balancing is permitted. We think by using the term "practicable" Congress intended rather to allow for the application of agency expertise and discretion in determining how best to manage fishery resources.*

NMFS has provided additional information on "practicable" in relation to discards:

> *What does "to the extent practicable mean"? From a National perspective, there is too much bycatch mortality in a fishery if a reduction in bycatch mortality would increase the overall net benefit of that fishery to the Nation through alternative uses of the bycatch species. In this case, a reduction in bycatch mortality is practicable and the excess bycatch mortality is a wasteful use of living marine resources. In many cases, it may be possible but not practicable to eliminate all bycatch and bycatch mortality (NMFS 2008).*

While neither NMFS nor the Courts appear to have provided perfect clarity on how much discard reduction should take place, it seems clear that the biological and economic benefits and costs should be weighed. Unfortunately, it is difficult to precisely quantify many of the biological and economic benefits and costs of measures proposed in this Amendment with available scientific information. However, from a qualitative perspective, the reader will find impact information in Section 7 (also summarized in the Executive Summary).

The Magnuson-Stevens Fishery Conservation and Management Act also provides discretionary authority to "include management measures in the plan to conserve…non-target species…considering the variety of ecological factors affecting fishery populations" (Section 303(b)(12)). This would appear to provide Councils with considerable discretion to address catch of non-target species regardless of catch disposition (retained or discarded). Given the ecological forage role of RH/S these discretionary provisions would appear to be well suited for the present actions under consideration. Presumably similar evaluations of what is "practicable" would affect decision making given the discretionary nature of these provisions.

Related to the mandate to reduce discards and discretionary authority to conserve non-target species, this Amendment considers a variety of alternatives to reduce catch of RH/S. This Amendment is not the first action taken to reduce discards in the MSB fisheries - Amendment 10 implemented measures to reduce discards (especially butterfish) in the longfin squid fishery and bring the FMP into compliance with MSA requirements. These measures included an increased mesh size (from 1.875 inches to 2.125 inches) and a cap that closes the longfin squid fishery if a certain amount of butterfish is caught.

Amendment 14 continues the Council's required efforts to minimize discards to the extent practicable and also considers discretionary provisions to reduce catch of RH/S regardless of the final disposition (discarded or retained) of that catch. After reviewing the DEIS and public comment the preferred alternatives have been deemed to be practicable measures that can be implemented.

4.1.C PURPOSE C: Consider adding RH/S as "stocks in the fishery" in the MSB FMP

Purpose C was to consider alternatives that would bring RH/S into the MSB plan as a managed stock in terms of Council management responsibilities, including annual catch limits and accountability measures, in order to improve overall RH/S management and conservation. In the Draft Environmental Impact Statement (DEIS), Alternative Set 9 considered whether to add RH/S as stocks in the fishery. Since the Council chose no action for that entire alternative set, and also has begun Amendment 15 to more fully consider the issue, the stock in the fishery issue has been moved into the "considered but rejected" section (2.4) and is summarized there. Amendment 15 will allow the Council to fully evaluate the merits of potentially adding RH/S as stocks and fisheries directly managed by the Council.

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4.2 HISTORY OF FMP DEVELOPMENT

Management of the Atlantic mackerel, longfin squid and *Illex* squid, and butterfish fisheries began through the implementation of three separate FMPs (one each for mackerel, squid, and butterfish) in 1978. The plans were merged in 1983. Over the years a wide variety of management issues have been addressed including rebuilding, habitat conservation, discards minimization, and limited entry. The original plans, amendments and frameworks that affected management of these fisheries are summarized below.

Table 10. History of FMP Development

History of the Atlantic Mackerel, Squid and Butterfish FMP		
Year	**Document**	**Management Action**
1978-1980	Original FMPs (3) and individual amendments	Established and continued management of Atlantic mackerel, squid, and butterfish fisheries
1983	Merged FMP	Consolidated management of Atlantic mackerel, squid, and butterfish fisheries under a single FMP
1984	Amendment 1	Implemented squid optimum yield adjustment mechanism
		Revised Atlantic mackerel mortality rate
1986	Amendment 2	Equated fishing year with calendar year
		Revised squid discards foreign fishing allowances
		Implemented framework adjustment process
		Converted expiration of fishing permits from indefinite to annual
1991	Amendment 3	Established overfishing definitions for all four species
1991	Amendment 4	Limited the activity of directed foreign fishing and joint venture transfers to foreign vessels
		Allowed for specification of optimum yield for Atlantic mackerel for up to three years
1996	Amendment 5	Adjusted longfin squid MSY; established 1 7/8" minimum mesh size
		Eliminated directed foreign fisheries for longfin squid, *Illex*, and butterfish
		Instituted a dealer and vessel reporting system; Instituted operator permitting
		Implemented a limited access system for longfin squid, *Illex* and butterfish
		Expanded management unit to include all Atlantic mackerel, longfin squid, *Illex*, and butterfish under U.S. jurisdiction.
1997	Amendment 6	Established directed fishery closure at 95% of DAH for longfin squid, *Illex* and butterfish with post-closure trip limits for each species

		Established a mechanism for seasonal management of the *Illex* fishery to improve the yield-per recruit
		Revised the overfishing definitions for longfin squid, *Illex* and butterfish
1997	Amendment 7	Established consistency among FMPs in the NE region of the U.S. relative to vessel permitting, replacement and upgrade criteria
1998	Amendment 8	Brought the FMP into compliance with new and revised National Standards and other required provisions of the Sustainable Fisheries Act.
		Added a framework adjustment procedure.
2001	Framework 1	Established research set-asides (RSAs).
2002	Framework 2	Established that previous year specifications apply when specifications for the management unit are not published prior to the start of the fishing year (excluding foreign fishing specifications)
		Extended the *Illex* moratorium for one year; Established *Illex* seasonal exemption from longfin squid minimum mesh;
		Specified the longfin squid control rule; Allowed longfin squid specs to be set for up to 3 years
2003	Framework 3	Extended the moratorium on entry to the *Illex* fishery for an additional year
2004	Framework 4	Extended the moratorium on entry to the *Illex* fishery for an additional 5 years
2008	Amendment 12	Standardized Bycatch Reporting Methodology
2009	Amendment 9	Extended the moratorium on entry into the *Illex* fishery, without a sunset provision
		Adopted biological reference points for longfin squid recommended by the stock assessment review committee (SARC).
		Designated EFH for longfin squid eggs based on available information
		Prohibited bottom trawling by MSB-permitted vessels in Lydonia and Oceanographer Canyons
		Authorized specifications to be set for all four MSB species for up to 3 years
2010	Amendment 10	Implemented a butterfish rebuilding program.
		Increased the longfin squid minimum mesh in Trimesters 1 and 3.
		Implemented a 72-hour trip notification requirement for the longfin squid fishery.
2011	Amendment 14	Mackerel limited access
		EFH Updates
		Commercial/Recreational Mackerel Allocation
2011	Amendment	Annual Catch Limit and Accountability Measure Omnibus Amendment

	13	
2011	Amendment 11	Limited Access in the Atl mackerel fishery; EHF updates, Rec/Com allocation. Currently being implemented.

4.3 FMP General Management Objectives/Goals

The objectives, as described in the FMP as currently amended, are listed below.

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the U.S. commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

4.4 Management Unit/Scope

The management unit is currently all northwest Atlantic mackerel (*Scomber scombrus*), longfin squid, *Illex illecebrosus*, and butterfish (*Peprilus triacanthus*) under U.S. jurisdiction though an alternative in the amendment could effectively extend the management unit to include RH/Ss.

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5.0 MANAGEMENT MEASURES AND ALTERNATIVES

Throughout this document the reader will note that the focus of the alternatives is on the Atlantic mackerel and longfin squid fisheries (and more on mackerel for preferred alternatives since several times more RH/S appear to be caught in the mackerel fishery compared to the longfin squid fishery). This is intentional because those are the MSB fisheries that appear to have at least somewhat substantial RH/S interactions. The *Illex* fishery appears to rarely interact with RH/S (see table 21) and there has not been a directed butterfish fishery since 2001. All of the alternatives are geared to RH/S issues, whether in regards to monitoring, catch reduction, or general management.

A variety of alternatives were considered but rejected by the Council for a variety of reasons. A summary of those alternatives and an explanation of why they were rejected follows immediately below:

Considered but Rejected Management Actions

1. The Council decided not to add a provision for annual forage set-asides for mackerel, squids, and butterfish. Instead, the Council noted that the recent Omnibus Annual Catch Limit Amendment already allows harvest reductions due to forage concerns and concluded that formal set-asides would be better considered after the Council develops ecosystem level goals and objectives that are informed by the ongoing work of the ecosystem subcommittee of the Scientific and Statistical Committee.

2. The Council considered including consideration of catch shares for the squid fisheries during the scoping process but concluded that it would be more effective to focus Amendment 14 on river herring and shad issues. Also, there was strong public comment against including squid catch shares at the current time.

3. The Council considered requiring a 6 hour pre-landing notification via phone to land more than 20,000 pounds of mackerel so as to facilitate quota monitoring. This was removed because NMFS is trying to phase out phone notifications of this kind.

4. The Council considered requiring a 6 hour pre-landing notification via phone to land more than 2,500 pounds of longfin squid so as to facilitate quota monitoring. This was removed because NMFS is trying to phase out phone notifications of this kind.

5. The Council considered requiring daily electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed because other options seemed equally effective and the infrastructure for 24hr reporting is burdensome for both NMFS and dealers.

6. The Council considered requiring 48 hour electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed because other options seemed equally effective and the infrastructure for 48hr reporting is burdensome for both NMFS and dealers.

7. The Council considered requiring 72 hour electronic reporting by MSB-permitted dealers so as to facilitate quota monitoring and cross checking with other data sources. This was removed because other options seemed equally effective and the infrastructure for 72hr reporting is burdensome for both NMFS and dealers.

8. The Council considered requiring trip termination following 3 slipped hauls on an observed trip so as to minimize slippage events. The goal is to minimize slippage events. This was removed because other options seemed equally effective (termination after 1 or 2 hauls) and having 3 slipped hauls on one trip would be a rare event.

9. The Council considered using mesh changes to reduce the catch of river herrings and shads but concluded such measures were not feasible due to the lack of trawl mesh selectivity for mackerel, river herrings, and shads. Selectivity information would be necessary to evaluate both potential benefits to river herrings and shads and potential costs to the relevant directed fisheries.

10. Some measures under consideration address slippage where the contents of a net on an observed haul on an observed trip are released in the water. In these cases the observer cannot sample the released catch. Some alternatives considered requiring ¼ of the catch to be pumped on board but these were rejected because catch may be patchy so sampling from ¼ of the net may not provide reliable information.

11. To obtain information on fish that may remain in the net, the Council considered alternatives that would require nets to be periodically brought aboard after pumping for sampling. These alternatives were rejected because the observer program had already begun such sampling at higher rates than those considered in the document. An alternative was also added to prohibit any discarding of un-sampled fish, even operational discards.

12. To consider broader RH/S conservation and management issues, the DEIS considered adding any or all RH/S species as directly managed "stocks in the fishery" within the MSB FMP.

The Council initially considered adding none, one, or any combination of the RH/S species as "stocks" in the fishery. However, given the scope and complexity of the issue, the Council chose instead to develop a separate amendment, Amendment 15 to the MSB FMP, that would fully analyze the necessity of managing these stocks under the Magnuson-Stevens Act, the interjurisdictional issues related to management of these stocks, as well as the required and discretionary FMP provisions that would apply to those stocks if added to the fishery.

Further details are available in the DEIS, available at: http://www.nero.noaa.gov/regs/ under the 2012 "past action link," but generally the DEIS found that direct Council management impacts to RH/S would be expected to be positive for all relevant RH/S species and in approximately the same fashion but to an unknown degree given the various sources of RH/S mortality and limitations on RH/S productivity. Positive RH/S impacts were primarily related to: 1) potential additional federal support of RH/S management (assessments, FMP and specifications review, etc.); 2) additional coordination of conservation activities across agencies; 3) Essential Fish

Habitat (EFH) designation and consultations; and 4) implementation of Annual Catch Limits (ACLs) and Accountability Measures (AMs).

The two key questions that will have to be answered by the Council in Amendment 15 are: 1) Is the current management framework is sufficient to conserve RH/S stocks; and 2) Can federal management by the Council substantially improve management of RH/S. The uncertainty regarding the current factors causing RH/S populations to remain in depressed states means that it will be difficult to identify specific causes and link remedies to specific outcomes. Given this, the extent of benefits from adding RH/S as stocks in the fishery will be difficult to quantify even though impacts are likely to be positive, but that will be the task of Amendment 15. The development of Amendment 15 has begun and may be tracked at the Council website: http://www.mafmc.org/, and then clicking through to the Mackerel-Squid-Butterfish section or by contacting Jason Didden at jdidden@mafmc.org (302-526-5254).

NOTE ON COMBINATIONS WITHIN AND BETWEEN ALTERNATIVE SETS:

There are about 80 alternatives in this document. This means that there are millions of different possible combinations. At the beginning of each Alternative Set, it is noted which alternatives may, and which alternatives may not be, grouped together within the Alternative Set. Between Alternative Sets, alternatives generally may be combined without problem. The only broad exception to this rule is that it would appear unlikely that alternatives from both of the area-based alternatives (Sets 7 and 8) would be chosen together.

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5.1 Alternative Set 1: Additional Vessel Reporting Measures

5.1.1 Statement of Problem/Need for Action

Relatively low levels of catch monitoring have resulted in relatively high uncertainty about catch of RH/S in Mid-Atlantic and New England fisheries. The Council is therefore considering actions to decrease uncertainty so as to improve the management of RH/S catches. Some of these measures include changes to vessel reporting and these are included in this Alternative Set. These changes are intended to improve either the quality of data maintained by NMFS, the timeliness of that data, or both. Since dealer data is the primary monitoring tool for MSB quota management, the proposed vessel monitoring changes would mostly be useful for purposes of cross checking for errors that occur when data is entered into the dealer weighout databases.

5.1.2 General Rationale & Background

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. Some of the focus may appear to be on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries. However, because extrapolations of RH/S catch are often made based on total landings, accurate monitoring of the target species is important when determining total catch of RH/S.

Current Reporting Requirements

The current suite of reporting requirements for MSB fisheries is further described under the No-action alternative below. But a general reporting summary is provided here as an introduction. The Northeast Region has two main types of reporting requirements for vessels, Vessel Trip Reporting (VTR) and Vessel Monitoring Systems (VMS). VTRs include such information as: Vessel identification; date fished; location fished; gear used, number of crew; total number of hauls; average tow duration; weight of species caught; and dealer information. All permits require VTR submissions, but at different time scales. VTRs are required to be submitted on a monthly basis for MSB permits but most MSB-permitted vessels must already submit VTRs on a weekly basis because of requirements for other permits (Atlantic herring or NE multispecies). NMFS has been moving many of the region's fisheries toward weekly vessel trip reporting (VTR) to improve monitoring and monitoring timeliness.

VMS is used to collect near-real time vessel location information, and is often required for permits for fisheries that have area-based management components. Generally electronic VMS units are installed on vessels and automatically report vessel location to NMFS at least hourly. Several fisheries also require catch reporting via VMS. The herring fishery requires daily VMS catch reporting, and the multispecies fishery requires VMS catch reports at the close of each trip. The U.N. Food and Agriculture Organization has an informative primer on the use of VMS for the Monitoring, Control and Surveillance of fishing vessels here:

http://www.fao.org/docrep/003/w9633e/w9633e06.htm#TopOfPage. VMS units are not currently required for any MSB fisheries, although many MSB permitted vessels have VMS units due to requirements for other permits.

While landings information submitted weekly by dealers is the primary tool for MSB fishery quota monitoring, both VTR and VMS data have the potential to be used by managers for cross checking dealer data when monitoring quotas and making catch extrapolations. Alternatives in this set may appear to focus on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries. However, because extrapolations are often made based on total landings, accurate monitoring of the target species can be as important as determining the encounter rates of RH/S. This is because when estimations of non-target catch (including discards) such as RH/S are made with observer data, they are usually made based on the ratio of RH/S to total retained catch applied to landings data. For example, if it was found that in observer data, 1 pound of RH/S was caught for every 100 pounds of fish landed by mackerel vessels, and those same vessels landed 1,000,000 pounds of fish, one could estimate that 10,000 pounds of RH/S were caught. While small differences in the total landings number will not affect the estimate substantially, it is still important for both the ratio and the total landings number to be as accurate as feasibly possible.

The Northeast Fishery Observer Program also collects information on discarded and unusual catches via on-board monitors (called "observers") placed by NMFS. Currently in MSB fisheries, just the longfin squid fishery has a requirement to provide 48-hour pre-trip notifications so that observers may be more efficiently allocated in that fishery. Additional details on existing observer-related provisions may be found below in section 5.3.3.

The current way vessel data is collected for MSB fisheries may be insufficient for a variety of reasons. The action alternatives discuss these reasons below since each addresses particular potential deficiencies.

PREFERRED ALTERNATIVES

The preferred alternatives from Alternative Set 1 would: require weekly VTR reporting for all MSB vessel permits (1c); require a 48-hour pre directed mackerel trip notification (1d48); require VMS and daily VMS catch reporting for mackerel and longfin squid vessels (1eMack, 1eLong, 1fMack, and 1fLong); and require a 6-hour pre-landing notification via VMS for mackerel landings greater than 20,000 pounds (1gMack).

These preferred alternatives are designed to be integrated with existing monitoring and reporting requirements and other measures in this document to create an overall complementary system that provides accurate data on the catch of RH/S in the mackerel and longfin squid fleets. Each preferred alternative will add incremental information about RH/S catch as described below and thus provide incremental benefits in terms of better data to perform assessments and guide management. While not directly impacting RH/S stocks, better catch data should help improve RH/S assessments and management indirectly.

5.1.3 Management Alternatives

NOTE ON COMBINATIONS: Most of the Alternative Set 1 action alternatives could be implemented individually or collectively. However, 1c (weekly VTRs for all MSB permits) would encompass 1bMack and 1bLong so these would not be selected together. The 48-hr mackerel pre-trip notification (1d48) and 72-hr mackerel pre-trip notification (1d72) would also be mutually exclusive – only one would be chosen if either. The VMS reporting alternatives (1f's and 1g's) would need the respective 1e's (that require VMS) for each fishery as a prerequisite before requiring VMS reporting.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

1a. No-action

The current monitoring requirements would remain in effect, and these are described below for MSB permits.

The owner or operator of any vessel issued a valid permit or eligible to renew a limited access permit must maintain on board the vessel, and submit, an accurate fishing "Vessel Trip Report" log for each fishing trip, regardless of species fished for or taken, on forms supplied by or approved by the Regional Administrator. If no fishing trip is made during a month, a report stating so must be submitted for each month. If authorized in writing by the Regional Administrator, a vessel owner or operator may submit reports electronically, for example by using a VMS or other media. At least the following information and any other information required by the Regional Administrator must be provided: Vessel name; United States Coast Guard documentation number (or state registration number, if undocumented); permit number; date/time sailed; date/time landed; trip type; number of crew; number of anglers (if a charter or party boat); gear fished; quantity and size of gear; mesh/ring size; chart area fished; average depth; latitude/longitude (or loran station and bearings); total hauls per area fished; average tow time duration; hail weight, in pounds (or count of individual fish, if a party or charter vessel), by species, of all species, or parts of species; dealer permit number; dealer name; date sold, port and state landed; and vessel operator's name, signature, and the operator's permit number (if applicable).

VTRs must be filled out with all required information, except for information not yet ascertainable, prior to entering port. Information that may be considered unascertainable prior to entering port includes dealer name, dealer permit number, and date sold. Log reports must be completed as soon as the information becomes available. Upon the request of an authorized officer or an employee of NMFS designated by the Regional Administrator to make such inspections, all persons required to submit reports under this part must make immediately available for inspection copies of reports, and all records upon which those reports are or will be based, that are required to be submitted or kept under this part. Copies of fishing log reports must be kept on board the vessel and available for review for at least 1 year, and must be retained for a total of 3 years after the date the fish were last possessed, landed, and sold.

VTRs for MSB permits are currently required on a monthly basis, and must be postmarked or received by NMFS within 15 days after the end of the reporting month. If no fishing trip is made during a particular month for such a vessel, a report stating so must be submitted, as instructed by the Regional Administrator. Once the mackerel limited access system becomes operational, Tier 3 Limited Access mackerel permits' VTRs will be required on a weekly basis, and must be postmarked or received by midnight of the first Tuesday following the end of the reporting week. If no fishing trip is made during a reporting week for such a vessel, a report stating so must be submitted and received by NMFS by midnight of the first Tuesday following the end of the reporting week.

VMS is not required for MSB permits but most MSB permits do have VMS requirements because of permits in other fisheries. A description of the proposed VMS monitoring, which is identical to current measures in place for other fisheries is described in the relevant action alternatives below.

For only longfin squid/butterfish moratorium permits, there is currently a 48-hour pre-trip notification in order to facilitate the placement of observers. Vessels must wait up to 48 hours from the time of notification for an observer if they are selected to take an observer.

Currently there is no way for the observer program to identify mackerel trips for observer placement purposes. Observers are carried on board some trips that land mackerel related to their placement on other vessels, primarily directed herring trips, but there is no systematic way to place observers on trips targeting mackerel.

1bMack. Institute weekly vessel trip reporting (VTR) for mackerel permits.

AND

1bLong. Institute weekly vessel trip reporting (VTR) for longfin squid/Butterfish permits.

AND

1c. Institute weekly vessel trip reporting (VTR) for all MSB permits (Mackerel, longfin squid//Butterfish, *Illex*) so as to facilitate quota monitoring and cross checking with other data sources. (PREFERRED)

With monthly reporting, data is not collected in a timely-enough manner to be feasibly used for quota monitoring. Weekly reporting would match the dealer reporting timeframe and increase the feasibility of using VTR data to cross-check dealer data. These three alternatives differ only in the permit categories that would be affected, as described in the alternatives themselves.

The basic VTR requirements would remain the same as described in the no-action alternative but the timing would change. Instead of the current monthly reporting for all but Tier 3 mackerel permits, the following timing requirement would be implemented:

VTRs must be postmarked or received by midnight of the first Tuesday following the end of the reporting week (each reporting week begins at 12:00am Sunday morning and ends 11:59pm Saturday night). If no fishing trip is made during a reporting week, a report stating so must be submitted and received by NMFS by midnight of the first Tuesday following the end of the reporting week. The date when fish are offloaded will establish the reporting week that the VTR must be submitted to NMFS. Any fishing activity during a particular reporting week (*i.e.,* starting a trip, landing, or offloading catch) will constitute fishing during that reporting week and will eliminate the need to submit a negative fishing report to NMFS for that reporting week. For example, if a vessel begins a fishing trip on Wednesday, but returns to port and offloads its catch on the following Thursday (*i.e.,* after a trip lasting 8 days), the VTR for the fishing trip would need to be submitted by midnight Tuesday of the third week, but a negative report (*i.e.,* a "did not fish" report) would not be required for either earlier week.

1d48. Require 48 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement. (PREFERRED)

AND

1d72. Require 72 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement.

These notifications would be used to facilitate observer placement in a systematic fashion contingent upon funding. If vessels did not notify they would not be able to land more than incidental level of fish (20,000 pounds). These two alternatives differ only in how much lead time a vessel must provide before intending to depart. Currently the longfin squid fishery has a 48-hour requirement. The requirement was implemented in order to give observers sufficient time to be deployed to vessels.

Notification Mechanism

Mackerel permit holders would have to notify the Northeast Fishery Observer Program (NEFOP) at least 72 or 48 hours, but no more than 10 days, prior to any trip on which you intend to land over 20,000 lb of mackerel. This requirement would be in effect for the entire fishing year. Notification could be made using any of the following methods:

1) ONLINE via the Pre-Trip Notification System (PTNS - preferred method): The PTNS is accessible at https://fish.nefsc.noaa.gov/PTNS/.
2) EMAIL: Vessels could also submit a trip notification by email to NEFSC.PTNS@noaa.gov.
3) TELEPHONE: Vessels could also call 1-855-FISHES1 (1-855-347-4371).

1eMack. Require VMS for limited access mackerel vessels. (PREFERRED)

AND

1eLong. Require VMS for longfin squid/butterfish moratorium vessels (see 1f and 1g below). (PREFERRED)

There is currently no VMS requirement for mackerel or longfin squid/butterfish moratorium vessels. If area-based management measures are implemented via this amendment then having VMS for compliance/enforcement could be useful.

Vessel Monitoring Systems are currently utilized in many New England fisheries. They are generally used to facilitate compliance and enforcement of area-based management measures as well as catch monitoring by means of a satellite connection between shore and a fixed electronic unit installed on vessels. Vessels that do not currently have VMS units would have to purchase and install electronic VMS units (see section 7 for costs and number of vessels impacted).

Vessels would be required to declare into the fishery for trips targeting mackerel and/or longfin squid. The VMS would ping NMFS w/ location information at least every hour, 24 hr a day, throughout the year (herring also does every one hour). Vessels with more stringent requirements (more frequent communication) would still be bound by those requirements.

Vessels would have to provide documentation to the Regional Administrator at the time of application or reapplication for a mackerel or longfin squid/butterfish limited access permit that the vessel has an operational VMS unit installed on board that meets the minimum performance criteria. Vessels would have to confirm the VMS unit's operation and communications service to NMFS by calling the Office of Law Enforcement (OLE) to ensure that position reports are automatically sent to and received by NMFS OLE. NMFS does not regard the fishing vessel as meeting the VMS requirements until automatic position reports and a manual declaration are received.

<u>1fMack</u>. Require daily VMS reporting of catch by limited access mackerel vessels so as to facilitate monitoring and cross checking with other data sources. Requiring VMS (see 1eMack above) and requiring trip declarations (would be a prerequisite for this alternative. (PREFERRED)

AND

<u>1fLong</u>. Require daily VMS reporting of catch by longfin squid moratorium permits so as to facilitate monitoring and cross checking with other data sources. Requiring VMS (see 1eLong above) and requiring trip declarations would be a prerequisite for this alternative. (PREFERRED)

Landings information submitted weekly by dealers is the primary tool for MSB fishery quota monitoring. Data collected from one Sunday-Saturday period must be reported by the following Tuesday. So landings on a Saturday must be reported 3 days later and landings on a Sunday must be reported 9 days later. Due to the high-volume nature of the Atlantic herring fishery, quota monitoring was difficult with these timeframes so it implemented daily VMS reporting of catch for Atlantic Herring (by 9am for the previous days catch). Given the overlap between the Atlantic herring and mackerel fisheries, requiring VMS for mackerel vessels would make reporting requirements consistent for vessels that participate in these fisheries. Daily VMS reporting would also decrease the probability of future quota overages caused by the time-lag in reporting, However, there have not been recent quota monitoring problems with the mackerel and/or longfin squid fisheries. If these alternatives were implemented, the following provisions would apply:

The owner or operator of a vessel issued a limited access permit to fish for mackerel and/or longfin squid would have to report catches (retained and discarded) of mackerel and/or longfin squid daily via VMS when on a declared trip, unless exempted by the Regional Administrator. The report would have to include at least the following information, and any other information required by the Regional Administrator: Fishing Vessel Trip Report serial number; month and day fish was caught; pounds retained; and pounds discarded. Daily VMS catch reports would have to be submitted in 24-hr intervals for each day and must be submitted by 0900 hr of the following day. Reports would be required even if fish caught that day has not yet been landed. This reporting would not exempt the owner or operator from other applicable reporting requirements. The owner or operator would have to submit a catch report via VMS each day when on a declared trip, regardless of how much fish is caught (including days when no mackerel and/or longfin squid are caught), unless exempted from this requirement by the Regional Administrator.

While there are no alternatives for area-based reporting of catch, which is what VMS is most useful for, VMS reporting does provide more rapid information about fish soon to be landed. This makes quota overages due to time-lags in reporting of landings less likely. Since mortality caps are often extrapolated from landings information, VMS reporting could be useful for either directed fishery quota monitoring or indirectly for a mortality cap.

1gMack. Require 6 hour pre-landing notification via VMS to land more than 20,000 pounds of mackerel, which could facilitate quota monitoring, enforcement, and/or portside monitoring. (PREFERRED)

AND

1gLong. Require 6 hour pre-landing notification via VMS to land more than 2,500 pounds of longfin squid, which could facilitate quota monitoring, enforcement, and/or portside monitoring. (The Council chose No Action for the longfin fishery for this measure.)

Pre landing notifications would be used to facilitate catch monitoring, enforcement, cross checking with other data sources, and portside monitoring (if applicable). There are currently no such notifications. If these alternatives were implemented, the following provisions would apply:

Vessels with mackerel and/or longfin squid limited access permits would have to report through VMS their intention to land more than 20,000 pound of mackerel and/or 2,500 pounds of longfin squid (these are the incidental trips limits for these species). Notification would have to be made no less than 6 hr prior to crossing the VMS Demarcation Line on the way back to port, and would have to include the estimated time of arrival in port, the port at which the catch will be landed, and the dealer(s) where offloads will occur. If the harvest ends less than 6 hr prior to landing, then the notification must be submitted immediately upon the conclusion of fishing activities.

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5.2 Alternative Set 2: Additional Dealer Reporting Measures

5.2.1 Statement of Problem/Need for Action

The way that dealers report landings has contributed to relatively high uncertainty about catch of RH/S in Mid-Atlantic and New England fisheries for two primary reasons. First, RH/S are often not reported in mixed landings of mackerel and Atlantic herring when the RH/S constitute a small percentage of the total landings. Second, it is not always clear how the quantities of fish reported are derived. Since extrapolations of are often based on total landings estimates (see 5.1.2), accurate monitoring of target species can also be important for determining encounter rates for non-target species.

In addition, general dealer reporting errors can be difficult to locate and correct because vessels generally do not confirm dealer data entries, though they can request and/or access their landings records. Fishermen report that when they request their dealer landings history there are frequently major errors (NMFS will investigate and if appropriate correct such errors).

5.2.2 General Rationale & Background

2b seeks to establish a mechanism where vessels could easily confirm what dealers entered via an internet connection to address the general dealer reporting error issue described above.

2c-2f would create a system that would at least gather information about how dealers are establishing landings composition and weights and could require all fish to be actually weighed. These would address the primary issues described above that contribute to relatively high uncertainty about catch of RH/S in Mid-Atlantic and New England fisheries.

Since there is no current standard for reporting weights, it is difficult to ascertain the prevalence of current procedures for determining weights. Staff discussions with MSB Advisory Panel members suggest that the majority of dealers are currently weighing a majority of their MSB landings, often with state-certified scales. However, there are some instances, especially with mackerel, where product may de-watered (or partially de-watered) and shipped by truck before it is weighed. In such instances the receiver may report back a weight, or weights may be estimated based on the size of the shipping containers or truck volume.

PREFERRED ALTERNATIVES

The preferred alternatives from Alternative Set 2 would: require federal MSB dealers to weigh all landings of mackerel over 20,000 pounds (2d) and longfin squid over 2,500 pounds (2f) or document why they cannot weight landings (2g). (If all fish are not weighed separately, dealers would have to document with each transaction how they estimate the relative composition of mixed catches.).

These preferred alternatives are designed to be integrated with existing monitoring and reporting requirements and other measures in this document to create an overall complementary system that provides accurate data on the catch of RH/S in the mackerel and longfin squid fleets. Each preferred alternative will add incremental information about RH/S catch as described below and thus provide incremental benefits in terms of better data to perform assessments and guide management. While not directly impacting RH/S stocks, better catch data should help improve RH/S assessments and management indirectly.

5.2.3 Management Alternatives

NOTE ON COMBINATIONS: Most of the Alternative Set 2 action alternatives could be implemented individually or collectively. However, 2c and 2d (weighing mackerel) would be mutually exclusive – only one would be chosen if either. Likewise, 2e and 2f (weighing longfin squid) would be mutually exclusive – only one would be chosen if either. 2g (dealers can use volume to weight conversions) would modify 2c, 2d, 2e, or 2f so 2g could only be chosen if at least one of those four alternatives was also chosen.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

2a. No-action

The current dealer reporting requirements would remain in place. 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 (VTRs are currently the only cross check for dealer information on MSB landings). Dealers are required to submit a report even if there is no activity during a week. As described above, it is believed that most dealers already weigh most mackerel and longfin squid catches but some may use volume to weight conversions.

2b. Require federally permitted MSB dealers to obtain vessel representative confirmation of Standard Atlantic Fisheries Information System transaction records for mackerel landings over 20,000 lb, *Illex* landings over 10,000 lb, and longfin squid landings over 2,500 lb.

This would be accomplished via Fish Online, an existing internet-based program that currently allows vessels to voluntarily check their landings records. The purpose would be to catch errors at the first point of entry in the data system. Alternative 2b 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. Since dealers have to report the previous week's landings on Tuesdays, vessel representatives would need to confirm the reports submitted by one Tuesday by 11:59pm on the following Friday, providing three business days to make such confirmations. Dealers would have to record a confirmation from vessel representatives that a vessel representative had used Fish Online to confirm that their landings had been entered appropriately.

2c. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

AND

2d. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch. (PREFERRED)

These alternatives would only apply to mackerel landings over 20,000 lb. Most dealers already weigh most of their mackerel landings by packing mackerel into boxes in weighed quantities. These alternatives are geared to apparently infrequent occasions where large quantities of mackerel are shipped without accurate weighing and would require applicable dealers that do not already have access to scales to purchase scales or pay for weighing by third parties.

The cost of scales can vary dramatically. The use of an already existing truck scale can cost as little as $10, but the distance to reach one may make their use impracticable. 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 use trucks in the transport of fish however, and water weight can impact the accuracy of measurements. Floor scales handling up to 20,000 pounds cost $3,000-$5,000 while floor scales that can weigh up to 100,000 pounds cost $13,000-$17,000. 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. Smaller scales costing several hundred dollars may be purchased but may mean that additional time is required to process a product.

In addition, if dealers do not sort by species, these alternatives would require dealers to document how they estimate the relative composition of a mixed catch in order to report the

amount of each species bought from vessels on either their annual dealer application (2c), or with each transaction (2d). These alternatives don't obligate dealers to always sort fish, they just obligate dealers to describe how they estimate species composition.

2e. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

AND

2f. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimate relative compositions of a mixed catch. (PREFERRED)

These alternatives would only apply to longfin squid landings over 2,500 lb. Since there is no current standard for reporting weights, it is difficult to ascertain the prevalence of current procedures for determining weights. Staff discussions with MSB Advisory Panel members suggest that the majority of dealers are currently weighing a majority of their MSB landings, often with state-certified scales. As such, this alternative would require as a legal requirement the existing general sorting and weighing practices.

2g. Related to preferred requirements to weigh all fish (2d, 2f), allow dealers to use volume to weight conversions if they cannot weigh landings – they would need to identify their conversion methods in their dealer application and explain why they cannot weigh all landings. (PREFERRED)

Under the no-action, dealers can choose to actually weigh their fish, or use some other method, such as volumetrics, to determine reported weights. Selecting this option would mean that, for 2c-2f, dealers could weigh fish or use volume to weight conversions. So either the weight or volume would have to be measured. Dealers would also have to document in their annual dealer application how they estimated the weights with volumetric measurements if the fish were not actually weighted. This could be as simple as identifying their assumed weight per volume of fish and how they estimate volume. While this alternative will not necessarily improve the data on landed fish, it would at least develop complete data on how weights are being estimated so that the Council could use that information in the future to decide if additional reporting measures were appropriate.

5.3 Alternative Set 3: At-Sea Observation Optimization Measures

5.3.1 Statement of Problem/Need for Action

In addition to relatively low levels of at-sea catch monitoring, several issues have potentially resulted in the data that is collected being less than optimal (though still the best available).

5.3.2 General Rationale & Background

NEFOP data is primarily used to estimate discards, but is also used in some cases to estimate total catch, as with the case of the butterfish mortality cap for the longfin squid fishery. Since annual catch limits include all catch including discards, it is important to get good information on discards to minimize the chances of closing fisheries too early or too late.

The alternatives in this set seek to make sure the data coming out of the Northeast Fishery Observer Program (NEFOP) are as representative and as indicative of fishery activities as possible, especially addressing and minimizing circumstances where vessels open nets in the water before observers have a chance to sample the contents of the net. Slippage is an important concept in this Alternative Set, and within this amendment 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.

From 2006-2010 approximately 9% (383 of 4186 or 77 per year) of hauls on observed longfin squid trips (trips that caught 50% or more longfin squid or at least 10,000 pounds longfin squid) and 26% (73 of 277 or 15 per year) of hauls on observed mackerel trips (trips that caught 50% or more mackerel or at least 100,000 pounds mackerel) had some unobserved catch. Catch may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, or haul slipped (dumped) in the water. The above numbers would thus be an upper bound on slippage events. Since the MSB fisheries, and especially the mackerel fishery are relatively high-volume fisheries that can catch large quantities of fish in a single tow (as frequently documented in observer data), even a few slipped hauls could have the potential to substantially affect any analysis of the data or extrapolations made from the data. Therefore, alternatives to minimize slippage were included in the amendment. The issue is not so much that

a lot of slippage is occurring, just that if it did occur the overall value of observer data could be compromised because of the large quantities of fish that can be caught in a single tow.

PREFERRED ALTERNATIVES

The preferred alternatives from Alternative Set 3 would: require for mackerel and longfin-butterfish permits that: reasonable assistance be provided to observers (3b); notice of haul-back or pumping be provided to observers (3c); one observer is provided for each vessel on pair-trawl operations whenever possible (3d). Also, unless safety, mechanical, or spiny dogfish issues make it inappropriate, the same vessels would not be able to release hauls of fish ("slippage") prior to observer documentation, and catch affidavits would have to be completed for any pre-observed net release (3j). For mackerel limited access vessels, there would also be a fleet-wide cap of 10 non-emergency (safety, mechanical, spiny dogfish) slippages after which further non-emergency slippages would require a vessel to terminate their trip (3l).

These preferred alternatives are designed to be integrated with existing monitoring and reporting requirements and other measures in this document to create an overall complementary system that provides accurate data on the catch of RH/S in the mackerel and longfin squid fleets. Each preferred alternative will add incremental information about RH/S catch as described below and thus provide incremental benefits in terms of better data to perform assessments and guide management. While not directly impacting RH/S stocks, better catch data should help improve RH/S assessments and management indirectly.

5.3.3 Management Alternatives

NOTE ON COMBINATIONS: Many of the Alternative Set 3 action alternatives could be implemented individually or collectively. However, 3h (trip termination after 1 slipped haul) and 3i (trip termination after 2 slipped hauls) would be mutually exclusive – only one would be chosen if either. Likewise, 3k (fishery-wide slippage cap at 5 mackerel slippage events) and 3l (fishery-wide slippage cap at 10 mackerel slippage events) would be mutually exclusive – only one would be chosen if either. 3m (fishery-wide slippage cap at 5 longfin slippage events) and 3n (fishery-wide slippage cap at 10 longfin slippage events) are also mutually exclusive – only one would be chosen if either. 3p would replace fishery-wide slippage caps with vessel slippage caps and it would be expected that either 3p could be chosen or 3k-3n could be chosen (if any). Also, if 3j (slippage prohibition with exceptions) was chosen then 3f or 3g could not be selected (3f and 3g require all catch to be brought aboard but 3j provides some exceptions).

If alternatives 3f – 3p are selected for mackerel, they would also require the selection of Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

3a. No-action

The current requirements for vessels related to observers would continue to remain in effect. An owner or operator of a vessel on which a NMFS-approved sea sampler/observer is embarked must (§ 648.11(d)):

(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 or loran coordinates, 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.

When two boats are fishing cooperatively NMFS attempts to place observers on both vessels rather than just one but this does not always happen.

Slippage events are not currently required to be documented by any MSB permits although the observer program has had observers collecting more detailed information about slippage events since 2010. There are currently no requirements or disincentives for MSB-permitted vessels to avoid slipping hauls.

3b. Require the following reasonable assistance measures: provision of a safe sampling station; help with measuring decks, codends, and holding bins; help with fish collection; and help with basket sample collection by crew on vessels with mackerel limited access and/or longfin squid/Butterfish moratorium permits. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

Such assistance could help improve observer data by allowing the observer to focus on technical aspects of observing such as species identification, weighing, measuring, etc. While the observer program reports that many vessels provide this kind of assistance when possible already, codifying this would provide the observer program with additional leverage if cooperation problems occur on particular vessels. This language mirrors the measures proposed in Amendment 5 to the Atlantic Herring FMP. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

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. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

Such notification could help improve observer data by making sure the observer is aware of all sampling opportunities. While the observer program reports that many vessels provide this kind of assistance when possible already, and vessels must provide information about when fishing activity begins and ends, clarifying notifications include pumping and haul-back would provide the observer program with additional leverage if cooperation problems occur on particular vessels regarding sampling. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

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. Requirements can be modified via the annual specifications process.
(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the requirements may be modified through the annual specifications process.

If vessels are working in pairs conducting pair trawling or other types of fishing (e.g. using purse seines or carrier vessels) where both vessels are receiving fish, having observers on both vessels ensures that all catch from the pair trawling trip is observed. The observer program generally does this already but this would just provide additional policy direction that the Council deems it less than optimal for only half of a pair-trawl operation to be observed when both vessels are receiving fish. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

3e. On vessels with mackerel limited access and/or longfin squid moratorium permits, require slippage reports - "Released Catch Affidavits" from captains on observed trips if they slip a haul.

Selected alone, this alternative provides another account of slippage but does not do anything to deter slippage. This alternative would be used to augment and cross check the data collected by observers to develop a better understanding of slippage events. If a net is released, 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. Released Catch Affidavits must be submitted within 48 hours of completion of the trip. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

3f. Prohibit vessels with Mackerel limited access permits that have notified for a mackerel trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

3g. Prohibit vessels with longfin squid moratorium permits that have notified for a longfin squid trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

3f and 3g would be used to improve the quality of data collected by observers by requiring all fish that will be discarded be brought aboard for sampling in order to develop complete information about all species caught in the mackerel fishery (3f) or longfin squid fishery (3g).

3h. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 1 slipped haul on an observed trip so as to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip any hauls on an observed trip so that data can be obtained on the composition of all catches. It would apply to vessels that had notified for a mackerel and/or longfin squid trip (longfin squid trips most already notify and notification for mackerel trips is considered in Alternative Set 1).

3i. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 2 slipped hauls on an observed trip so as to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip 2 hauls on an observed trip so that data can be obtained on the composition of all catches. It would apply to vessels that had notified for a mackerel and/or longfin squid trip (longfin squid trips most already notify and notification for mackerel trips is considered in Alternative Set 1).

3j. With the exceptions noted below, mackerel limited access and/or longfin squid moratorium permitted vessels that have notified the observer program of their intent to land over 2,500 pounds of longfin squid or over 20,000 pounds of mackerel and have been selected to carry an observer would be required to pump/haul 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. Vessels would be prohibited from releasing fish from the net (slippage), 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.

Exceptions: 1) pumping the catch could compromise the safety of the vessel/crew
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 a net is released, including the exemptions 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. Released Catch Affidavits must be submitted within 48 hours of completion of the trip. Exemptions and provisions of this measure can be modified via the annual specifications process.

(PREFERRED)

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies that the exemptions and provisions of this requirement may be modified through the annual specifications process.

This alternative would seek to minimize slippage (gaining observer catch data) and also gain information on any slippage events that do occur by requiring "Released Catch Affidavits. This alternative is different from 3e in that 3e only requires affidavits but 3j prohibits slippage except for the exceptions. This alternative is different from 3f and 3g in that 3f and 3g do not provide

for the exceptions specified in 3j. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both. While observer records are the primary mechanism for determining what happened on an observed trip, the Council determined that the catch affidavits would provide a useful secondary stream of data on slippage, in the same way that VTR records are useful as a secondary data stream alongside dealer records when examining overall catch.

3k. Related to 3j, for mackerel limited access permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 fleet-wide for the rest of that year. The goal is to minimize slippage events.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 5 slippage events have occurred overall in a year by vessels declaring mackerel trips. The goal is to minimize unnecessary slippage events and maximize observers' ability to observe all catch. Once mackerel limited access permits had slipped 5 or more times in a year on notified mackerel trips, any subsequent slippage during a notified and observed trip by another mackerel limited access permitted vessel would force a trip termination for that vessel, even if that particular vessel had never slipped a haul before. 3k could only be selected if 3j was also selected.

3l. Related to 3j, 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 fleet-wide for the rest of that year. The goal is to minimize slippage events. The only slippages that would count against the cap are non-emergency events, so the exceptions 1, 2, and 3 in 3j would not count against the slippage cap. Operational discards (small quantities of fish that remain in the net) that are made available to the observer for visual access prior to discarding would also not count against the slippage cap. Requirements and provisions of the measure can be modified via the annual specifications process.
(PREFERRED)

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once 10 slippage events have occurred overall in a year by vessels declaring mackerel trips. The goal is to minimize unnecessary slippage events and maximize observers' ability to observe all catch. Once mackerel limited access permits had slipped 5 or more times in a year on notified mackerel trips, any subsequent slippage during a notified and observed trip by another mackerel limited access permitted vessel would force a trip termination for that vessel, even if that particular vessel had never slipped a haul before. 3k could only be selected if 3j was also selected.

The double underlined section is a slight modification from the original alternative in the DEIS and clarifies what kind of slippage events would count against the cap and allows the requirements and provisions of the cap to be modifiable via the annual specifications process.

While any slippage has the potential to compromise the overall value of observer data, the Council selected 10 non-exempt slippage events as a trigger in order to create a disincentive for vessels to slip catches, thereby addressing data quality issues while acknowledging that sometimes exigent circumstances require a certain degree of flexibility during fishery operations.

3m. Related to 3j, for longfin squid moratorium permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 minimize slippage events. (The Council chose No Action for the longfin fishery for this measure.)

This alternative would seek to discourage slippage events by requiring longfin squid vessels to terminate a trip if they slip a haul once 5 slippage events have occurred overall in a trimester by vessels declaring longfin squid trips. The goal is to minimize unnecessary slippage events and maximize observers' ability to observe all catch. Once longfin squid limited access permits had slipped 5 or more times in a trimester on notified longfin squid trips, any subsequent slippage during a notified and observed trip by another vessel would force a trip termination for that vessel, even if that particular vessel had never slipped a haul before. 3k could only be selected if 3j was also selected.

3n. Related to 3j, 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 minimize slippage events. (The Council chose No Action for the longfin fishery for this measure.)

This alternative would seek to discourage slippage events by requiring longfin squid vessels to terminate a trip if they slip a haul once 10 slippage events have occurred overall in a trimester by vessels declaring longfin squid trips. The goal is to minimize unnecessary slippage events and maximize observers' ability to observe all catch. Once longfin squid limited access permits had slipped 10 or more times in a trimester on notified longfin squid trips, any subsequent slippage during a notified and observed trip by another vessel would force a trip termination for that vessel, even if that particular vessel had never slipped a haul before. 3k could only be selected if 3j was also selected.

<u>3o</u>. For mackerel and/or longfin squid permitted vessels, if a trip is terminated within 24 hours because of any of the anti-slippage provisions (3g, 3h, 3k-3n), then the relevant vessel would have to take an observer on its next trip.

This would reduce a vessel's incentive to slip a haul early in a trip in order to cause a trip termination and thereby avoid having an observer on board for an extended trip. Especially if a vessel has to pay for observers by the day, there could be an incentive to cut a trip short if there is an observer onboard. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

<u>3p</u>. Allow mackerel and/or longfin squid permitted vessels to be assigned an annual quota (set during specifications) of slippage events related to 3j, specified annually. Once their slippage quota was reached, vessels would have to terminate an observed trip as well as upon any slippage event on subsequent observed trips for the remainder of the calendar year.

This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip a haul once a certain number of slippage events have occurred annually by that same vessel. While this is more intensive to track (by vessel versus by fleet), the advantage over fleet-based slippage caps (see above) is that one vessel is not penalized for another vessel's slippage event. This alternative could be selected for vessels with limited access mackerel permits, longfin squid/Butterfish moratorium permits, or both.

This alternative would be in place of the fleet-wide caps and the vessel caps would be specified at a later date. As such, potential benefits would occur in the future (versus 3k-3n which would be implemented sooner if selected) and be dependent on what level the cap was set at.

5.4 Alternative Set 4 - Port-side, 3rd Party, and Other Sampling/Monitoring Measure

5.4.1 Statement of Problem/Need for Action

Relatively low levels of catch monitoring have resulted in relatively high uncertainty about catch of river herrings and shads in Mid-Atlantic and New England fisheries.

5.4.2 General Rationale & Background

From a practical standpoint, it is more efficient to subsample the landings of river herring and other non-target species when a vessel targeting mackerel reaches the dock than when it is at sea. Discards that occur at sea of non-target species are easier to monitor than are the landed fractions that go into the hold due to the large volumes that go into the hold. Dockside sampling could utilize higher sampling rates to better characterize the species in retained catches and an entire catch could be evaluated in one day or less as opposed to having a person at sea for multiple days. This option does not mean that at-sea monitors are unnecessary – they are essential to monitor discarding at sea. However, since most RH/S are retained (esp. for mackerel trips), portside sampling could increase sampling coverage from current levels at a lower cost than additional at-sea observers. For longfin squid trips the preceding discussion probably does not apply because most RH/S are discarded so they are not available dockside.

Several other sampling/monitoring alternatives are also included in the Alternative Set as described below including alternatives to require volumetric hold certification of Tier 3 mackerel limited access permits and longfin squid moratorium permit holders. While in Amendment 11 the fish hold certification was primarily for purposes of capacity control (not allowing vessels to reconfigure to have substantially larger fish holds), in this Amendment the measure is being considered for purposes of facilitating rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates. There is also an ongoing voluntary project by industry to use fleet communication to avoid river herring hotspots. Since this project uses extensive post-side sampling a related alternative is included in this Alternative Set – the relevant alternative in this document just commits the Council to consider the project's results once completed in order to determine potential management implications.

PREFERRED ALTERNATIVES

The preferred alternatives from Alternative Set 4 would make implementation of additional portside monitoring and catch avoidance based on portside monitoring frameworkable (4f). While other monitoring measures were deemed to be more effective (see above and below), the Council wanted the option of a streamlined approach to implementing additional portside monitoring and catch avoidance in the future if appropriate.

5.4.3 Management Alternatives

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

4a. No-action

No-action - Port Sampling

There are no current requirements for port-side sampling of MSB trips to determine landings of RH/S or other species. NMFS port agents do currently work cooperatively with dealers to obtain biological samples needed for assessments but this is much smaller scale sampling than would be necessary to obtain estimates about the relative proportion of different species in a mixed catch. The states of Maine and Massachusetts have been conducting their own port-side sampling projects but state resource issues mean that their continued operation is uncertain. These state programs have been focused on herring but due to the overlap in the herring and mackerel fisheries also sample trips with mackerel.

While dealers are supposed to report all landings at the species level, to some degree RH/S can mix into Atl. Mackerel and especially Atlantic herring catches due to the similar body size and shape and high-volume nature of these fisheries.

No-action – Vessel Hold Requirements

There are no existing vessel hold requirements for Tier 3 mackerel permit holders or longfin squid/butterfish moratorium permit holders. Currently there are certified fish hold requirements being implemented through Amendment 11 to the MSB FMP for those vessels that qualify for Tier 1 and Tier 2 mackerel limited access permits. If a vessel is issued a Tier 1 or Tier 2 limited access mackerel permit, it must submit a fish hold volume certification by December 31, 2012. If an applicant submits a vessel replacement application prior to that date, he/she must submit a hold certification with the application. Amendment 11 to the MSB FMP specified that applicable vessels would be required to obtain a fish hold measurement from an individual credentialed as a Certified Marine Surveyor with a fishing specialty by the National Association of Marine Surveyors (NAMS) or from an individual credentialed as an Accredited Marine Surveyor with a fishing specialty by the Society of Accredited Marine Surveyors (SAMS). However, recent developments have suggested that this provision will likely be revisited because it appears likely that other professionals such as marine architects could be qualified in an equal or superior fashion.

Amendment 11 also implemented rules that any increase in hold size for Tier 1 and/or Tier 2 vessels could only be increased once and may not exceed 10 percent of the vessel's baseline hold

specification. Vessels with MSB permits do have other vessel baseline restrictions to control capacity increases based on length, tonnage, and horsepower but the purposes of the vessel hold measurement requirements in this Amendment are not for capacity control but for facilitating catch measurements.

No-action – Sustainable Fisheries Coalition Project

Currently vessels may voluntarily participate in the Sustainable Fisheries Coalition project, which is described in Alternative 4f below. The Sustainable Fisheries Coalition is an organization of the Atlantic herring and mackerel mid-water trawl and purse seine fleet operating from Maine through New Jersey. Vessels that are members of the Sustainable Fisheries Coalition account for the majority of Atlantic herring and mackerel landings in the U.S.

4b. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for mackerel landings over 20,000 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay providers directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

4c. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for longfin squid landings over 2,500 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay provider directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

For either 4b or 4c, implementation details are described below (these provisions are identical to those currently in effect for Northeast multispecies fishing). Dockside monitors for groundfish cost $50-$70/hr. Different sized vessels would have different costs for offload monitoring due to different hold sizes and processor offload speeds, but a 6-14 hour offload would cost $300-$980 for dockside monitoring. Discussions with MSB Advisory Panel members suggested that 6-14 hours would be typical offload time for high volume trips but trips around the thresholds of 20,000 pounds of mackerel or 2,500 pounds of longfin squid would take much shorter and cost less to monitor.

Vessels would be required to contact the Northeast Fisheries Observer Program (NEFOP) at least 6 hours prior to landing (some notification requirement options are detailed in Alternative Set 1 – but others may be developed during specifications). NEFOP would notify the vessel whether they are selected to secure a portside monitor. If a vessel is selected, a vessel representative would be responsible for contacting an approved portside monitoring vendor. If a trip is not selected for portside monitoring, NEFOP will issue a waiver.

Target coverage levels would be set annually during the specifications process. NEFOP would randomly select trips for coverage (i.e., no priority would be given to trips to specific areas, trips with at-sea observers, etc.).

In addition, the Council or Regional Administrator could adjust any aspects of the operation standards/procedures for the portside monitoring program through specifications.

Standards for Approval/Certification of Portside Monitoring Service Providers

The following standards would be used by NMFS to evaluate service providers employed by Mackerel and longfin squid vessels to comply with the portside reporting requirements outlined in this section. NMFS will certify/approve service providers and associated portside monitors as eligible to provide sector monitoring services based upon criteria specified below and can decertify/disapprove service providers and/or individual monitors if such criteria are no longer being met. NMFS will publish a list of approved service providers consistent with the Administrative Procedures Act.

The following standards and criteria for approval can be further modified by a future Council action. Portside monitoring program service providers must apply for certification/approval from NMFS. NMFS shall approve or disapprove a service provider based upon the completeness of the application and a determination of the applicant's ability to perform the duties and responsibilities of a portside monitoring service provider, as further defined below. As part of that application, potential service providers must include the following information:

- Identification of corporate structure, including the names and duties of controlling interests in the company such as owners, board members, authorized agents, and staff; and articles of incorporation, or a partnership agreement, as appropriate.
- Contact information for official correspondence and communication with any other office.
- A statement, signed under penalty of perjury, from each owner, board member, and officer that they are free from a conflict of interest with fishing-related parties including, but not limited to, vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions and will not accept, directly or indirectly, any gratuity, gift, favor, entertainment, loan, or anything of monetary value from such parties.
- A statement, signed under penalty of perjury, from each owner, board member, and officer describing any criminal convictions, Federal contracts they have had, and the performance rating they received on the contract, and previous decertification action while working as an observer or observer service provider.
- A description of any prior experience the applicant may have in placing individuals in remote field and/or marine work environments. This includes, but is not limited to, recruiting, hiring, deployment, and personnel administration.
- A description of the applicant's ability to carry out the responsibilities and duties of a portside monitoring service provider and the arrangements to be used.
- Evidence of adequate insurance to cover injury, liability, and accidental death for portside monitors (including during training). Workers' Compensation and Maritime Employer's Liability insurance must be provided to cover the portside monitors; vessel owner; and

service provider. Service providers shall provide copies of the insurance policies to portside monitors to display to the vessel owner, operator, or vessel manager, when requested.

- Service providers shall provide benefits and personnel services in accordance with the terms of each monitor's contract or employment status.
- Proof that the service provider's portside monitors have passed an adequate training course that is consistent with the curriculum used in the current NEFOP training course, unless otherwise specified by NMFS.
- An Emergency Action Plan describing the provider's response to an emergency with a portside monitors, including, but not limited to, personal injury, death, harassment, or intimidation.
- Evidence that the company is in good financial standing.

Monitoring service providers must be able to document compliance with the following criteria and requirements:

- A comprehensive plan to deploy NMFS-certified portside monitors according to a prescribed coverage level (or level of precision for catch estimation), as specified by NMFS, including all of the necessary vessel reporting/notice requirements to facilitate such deployment, including the following requirements:
    - A service provider must be available to industry 24 hours per day, 7 days per week, with the telephone system monitored a minimum of four times daily to ensure rapid response to industry requests.
    - A service provider must be able to deploy portside monitors to all ports in which service is required by this section.
    - A service provider must report portside monitor deployments to NMFS in a timely manner to determine whether the predetermined coverage levels are being achieved.
    - A service provider must assign portside monitors in a fair and equitable manner without regard to any preference by representatives of vessels other than when the service is needed and the availability of approved/certified monitors.
    - A service provider's portside monitor assignment must be representative of fishing activities for a given port and must be able to monitor fishing activity throughout the fishing year.
- The service provider must ensure that portside monitors remain available to NMFS, including NMFS Office for Law Enforcement, for debriefing for at least 2 weeks following any monitored offload.
- The service provider must report possible portside monitor harassment; discrimination; concerns about vessel safety or marine casualty; injury; and any information, allegations, or reports regarding portside monitor conflict of interest or breach of the standards of behavior to NMFS, as specified by NMFS.
- Service providers must submit to NMFS, if requested, a copy of each signed and valid contract (including all attachments, appendices, addendums, and exhibits incorporated into the contract) between the service provider and those entities requiring services (i.e., participating vessels) and between the service provider and specific portside monitors.

- Service providers must submit to NMFS, if requested, copies of any information developed and used by the service providers distributed to vessels, such as informational pamphlets, payment notification, description of duties, etc.
- A service provider may refuse to deploy a portside monitor on a requesting fishing vessel for any reason including, but not limited to, the following:
    - If the service provider does not have an available portside monitor prior to a vessel's intended date/time of landing.
    - If the service provider is not given adequate notice of vessel landing from the participating vessels, as specified by the service provider.
    - If the service provider has determined that the requesting vessel is inadequate or unsafe pursuant to the reasons described at § 600.746.
    - For any other reason, including failure to pay for previous deployments of portside monitors.
- A service provider must not have a direct or indirect interest in a fishery managed under Federal regulations, including, but not limited to, fishing vessels, dealers, shipping companies, Northeast multispecies sectors, advocacy groups, or research institutions and may not solicit or accept, directly or indirectly, any gratuity, gift, favor, entertainment, loan, or anything of monetary value from anyone who conducts fishing or fishing-related activities that are regulated by NMFS, or who has interests that may be substantially affected by the performance or nonperformance of the official duties of service providers. This does not apply to corporations providing reporting, dockside, and/or at-sea monitoring services to participants of another fishery managed under Federal regulations.
- A system to record, retain, and distribute the following information to NMFS, as requested, for a period specified by NMFS:
    - Portside monitor deployment levels, including the number of refusals and reasons for such refusals
    - Incident/non-compliance reports (e.g., failure to offload catch)
    - Hail reports, landings records, and other associated communications with vessels
- A means to protect the confidentiality and privacy of data submitted by vessels, as required by the Magnuson-Stevens Act.
- A service provider must be able to supply portside monitors with sufficient safety and data-gathering equipment, as specified by NMFS.

Standards for Approval/Certification of Individual Portside Monitors

For an individual to be certified as a portside monitor, the service provider must demonstrate that each potential monitor meets the following criteria:

- A high school diploma or legal equivalent.
- Successful completion of all NMFS-required training and briefings before deployment.
- Physical capacity for carrying out the responsibilities of a portside monitor pursuant to standards established by NMFS such as being certified by a physician to be physically fit to work as a portside monitor. The physician must understand the monitor's job and working conditions, including the possibility that a monitor may be required to climb a ladder to inspect fish holds and/or trucks.
- Absence of fisheries-related convictions based upon a thorough background check

- Independence from fishing-related parties including, but not limited to, vessels, dealers, shipping companies, sectors, sector managers, advocacy groups, or research institutions to prevent conflicts of interest

Note: Due to their similarities 4d and 4e are described together.

4d. Require volumetric vessel-hold certification for Tier 3 limited access mackerel permits and specify a volume to weight conversion.

4e. Require volumetric vessel-hold certification for longfin squid moratorium permits and specify a volume to weight conversion.

These alternatives could facilitate rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates. Amendment 11 to the MSB FMP specified that applicable vessels would be required to obtain a fish hold measurement from an individual credentialed as a Certified Marine Surveyor with a fishing specialty by the National Association of Marine Surveyors (NAMS) or from an individual credentialed as an Accredited Marine Surveyor with a fishing specialty by the Society of Accredited Marine Surveyors (SAMS). For the time being the same credentials are proposed for this amendment. However, recent developments have suggested that this provision will likely be revisited and it is possible that other professionals such as marine architects could be qualified in an equal or superior fashion. There would be no upgrade restrictions associated with these measures. This means that, unlike Tier 1 and 2 limited access mackerel permit holders, there would be no limitation on vessel upgrades related to the vessel hold certification for Tier 3 limited access mackerel permit holders and longfin squid moratorium permit holders. Put another way, the vessel hold certification for Tier 3 limited access mackerel permit holders and longfin squid moratorium permit holders would not restrict the transfer of these permits to a vessel with a larger fish hold volume.

4f. Within 6 months of the completion of the Sustainable Fisheries Coalition RH/S avoidance project (expected late 2013), the Council will meet to formally review the results and consider the appropriateness of developing a framework adjustment to implement any additional catch avoidance strategies that are suggested by the results of the Sustainable Fisheries Coalition avoidance project. (PREFERRED)

This would commit the Council to consider the findings from this project as they could apply to reducing the catch of RH/S in pelagic fisheries. Full details on this project are included in Appendix 7, but generally the project is testing if oceanographic and fishery data can be used to help industry avoid potential RH/S hotspots. Implementing measures similar to this project (i.e. making participation mandatory) would be a frameworkable action. Additional analysis will be competed if and when additional frameworks are initiated.

5.5 Alternative Set 5 - At-Sea Observer Coverage Requirements

5.5.1 Statement of Problem/Need for Action

Relatively low levels of catch monitoring have resulted in relatively high uncertainty about catch of river herrings and shads in Mid-Atlantic and New England fisheries. NMFS has strongly communicated that the at-sea portion of any additional observer coverage would have to be paid for by industry.

5.5.2 General Rationale & Background

Currently, observer coverage is allocated by methods outlined in the 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 discards reporting methodology in all FMPs of the New England Fishery Management Council and Mid-Atlantic Fishery Management Council. SBRM determines priorities in fleet selection for observer coverage, but overall coverage is dependent on fluctuating Federal budgets so observer coverage varies with each year's budget and priorities.

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.

Overall, though the SBRM has been vacated by court order, it is still the method that was used to make current observer allocations. 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 discards reporting methodology. A SBRM Fishery Management Action Team has been constituted to develop the new omnibus amendment and will begin work in 2012.

The SBRM can be viewed as the combination of sampling design, data collection procedures and analyses used to estimate discards and allocate observer coverage in 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 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). Instead, the SBRM is intended to support the application of multiple discard estimation methods that can be used in specific stock assessments. 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 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 allows for continuous improvement in allocation as new information on the results of the previous year's data is obtained.

Since RH/S are not federally-managed species, they have not been part of SBRM analyses. However, recently the science center has shifted funding, where possible, to mid-water trawl fleets in order to get better data on RH/S catch. Considerable uncertainty in RH/S catch remains, especially in pair-trawling that targets mackerel and in bottom-trawling primarily because of the rare-event nature of large RH/S catches.

This Alternative Set proposes higher levels of at-sea monitoring than are currently utilized. NMFS has indicated that additional observer coverage would have to be funded by industry. Initially alternatives were developed by fishery but even if management measures must be implemented by fishery, the analysis is best conducted by fleet (year/area/quarter/gear/mesh) because that is how the observer program allocates at-sea observer sea days and because of the mixed nature of MSB fisheries. 5b-5d are based on a fishery-specific approach while 5e approaches the issue from a SBRM fleet perspective. Because of the SBRM approach in 5e, it is the only alternative subset for which one can easily calculate what number of sea days would be required for a given target coefficient of variation (a measure of precision) in an upcoming year. That said, because of the inter-annual variability in catch and effort, using the prior year's information to predict what observer coverage level is necessary (as is the case with SBRM-type approaches) may not provide consistent results.

Observer program notification (see Alternative Set 1) would be a prerequisite for any of the alternatives in this set.

PREFERRED ALTERNATIVES

The preferred alternatives from Alternative Set 5 would: recommended 100% observer coverage of mid-water trawl (MWT) mackerel trips (5b4) as well as tiered coverage levels for small mesh bottom trawl mackerel trips (100% for Tier 1, 50% for Tier 2, and 25% for Tier 3) (5c4) along with requiring mackerel vessels to pay $325 when they carry observers to help fund the desired coverage levels (5f). Coverage levels would be re-evaluated after 2 years (5h).

These preferred alternatives are designed to be integrated with existing monitoring and reporting requirements and other measures in this document to create an overall complementary system that provides accurate data on the catch of RH/S in the mackerel and longfin squid fleets. Specifically they would increase the at-sea monitoring of these fisheries in order to obtain more complete catch information. Each preferred alternative will add incremental information about RH/S catch as described below and thus provide incremental benefits in terms of better data to perform assessments and guide management. While not directly impacting RH/S stocks, better catch data should help improve RH/S assessments and management indirectly.

5.5.3 Management Alternatives

NOTE ON COMBINATIONS: Only one of the 5b (observer coverage for mackerel mid-water trawl) alternatives could be chosen. Likewise, only one of the 5c (observer coverage for mackerel small mesh bottom trawl) and one of the 5d (observer coverage for longfin squid small mesh bottom trawl) alternatives could be chosen. One alternative from each of these could be selected (a total of three). 5e1 and 5e2 (strata-fleet alternatives for mid-water trawl) are mutually exclusive as are 5e3 and 5e4 (strata-fleet alternatives for small mesh bottom trawl) but one alternative from the first pair could be chosen with one from the second pair. If any of the 5e alternatives were chosen, they would not be combinable with any of the 5b, 5c, or 5d alternatives (coverage could be based on a set percentage of trips or a set target coefficients of variation (C.V.s) but not both). 5f, 5g, and 5h provide for industry funding and review of the increased observer coverage levels proposed in 5b-5e so they could be added on to any of the other action alternatives.

If any measure in this Alternative Set is selected for mackerel, the Council would also need to select Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

Alternatives 5b, 5c, and 5d would require various levels of overage of trips for certain trips types, either mackerel or longfin squid. While this kind of alternative is relatively easy to implement if a trip notification is required (an option in Alternative Set 1), it does not guarantee a given level of precision. Precision depends on a variety of factors including the year to very variability seen in the data. Also, estimates of catch from observer data are made based on

time/area/gear units, not fishery ("mackerel" or "longfin squid"). Since the mackerel and longfin squid fisheries comprise only a portion of mid-water trawls and small mesh bottom trawl activity, requiring a portion of mackerel trips or longfin squid trips be observed is not going to result in that level of coverage for a specified time/area/gear unit due to other fishing activities. Given the relatively low levels of coverage in the mackerel and longfin squid fisheries however, any of the action alternatives would increase coverage and lead to better precision. One cannot be sure how much however because of the issues described above. In alternatives 5b, 5c, and 5d below the C.V. rates are those if the entire time/area/gear unit had that level of coverage. The sea days associated with the fishery coverage levels are those from recent VTR data in the mackerel and longfin squid fisheries, since those are the fisheries under consideration that are under control of the Council.

Alternative 5e would require NMFS to develop coverage levels based on C.V.s expected for river herring at the time/area/gear unit that is used in estimating catch for the two fisheries that account for most river herring catch, mid-water trawl and small mesh bottom trawl. However, since the Council can only require the fisheries it manages to pay for observer coverage, and fisheries outside of the Council's control use the relevant gear types, and NMFS has said that any increase in observer coverage would have to be industry funded to be approvable, Alternative 5e would be very difficult to implement, as described below.

5a. No-action

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. 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.

Since the SBRM has been vacated by court order, it is not certain how observer coverage will be allocated in the immediate future. However, given legislative mandates and funding requirements of NMFS, it is likely that without additional action, the recent low levels of coverage for mackerel and longfin squid fishing will continue. From 2006-2010 approximately 6.5% of mackerel and 3.5% of longfin squid catches by weight were observed (see Section 6.3 for more details). Observer coverage sea-days are allocated by area-quarter-gear strata and these

fishery coverage percentages resulted from allocations to small mesh gear trips rather than allocations to these fisheries (see Appendix 2 for details). For Mid-Atlantic mid-water trawl (the primary area and gear for mackerel) and Mid-Atlantic bottom trawl (the primary area and gear for longfin squid) this has resulted in annual coefficients of variation (C.V.s) for individual RH/S species' catch estimates usually being above 0.5 and often above 1.0 (see Appendix 2). These values indicate very high uncertainty in the associated estimates. If you consider the C.V. as a percentage and double it, this provides approximately the 95% confidence interval for normally distributed data. So a C.V. of 0.5 (or 50%) means that the 95% confidence interval is approximately plus or minus 100% of the estimate.

5b. Mackerel Mid-Water Trawl (MWT)

Coverage of this fleet has historically primarily occurred because of the winter mixing of the herring and mackerel fisheries as opposed to focusing on the mackerel fishery. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation.

5b1. Require 25% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b2. Require 50% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b3. Require 75% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b4. Recommend 100% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

Note: Require was also changed to recommend since the Council makes recommendations to NMFS.

The following figures illustrate the C.V.'s that would have been expected in 2009 and 2010 for different fleets with different percentages of coverages of trips for mid-water trawls for blueback herring and alewife. Shad catches are low so C.V.s are very high even at high levels of coverage and their curves are not shown. As an illustration of how to read the figures, if you start at the 0.5 mark on the horizontal axis of any of the figures (indicates 50% coverage), and draw a straight line up, the place where it intersects a curve will tell you the expected C.V. for the relevant species (blueback or alewife) and relevant fleet by looking left from the intersection point to the C.V.s on the vertical axis. Overall and as would be expected, as the percentage of covered trips increases, the C.V. falls and precision increases. For example, on figure 10, it is estimated that if a 50% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.3 in Mid-Atlantic paired midwater trawls, of 0.7 in Mid-Atlantic single midwater trawls, of 0.3 in New England paired midwater trawls, and of 0.4 in New England single midwater trawls. On the same figure, it is estimated that if a 75% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.2 in Mid-Atlantic paired midwater trawls, of 0.5 in Mid-Atlantic single midwater trawls, of 0.2 in New England paired midwater trawls, and of 0.3 in New England single midwater trawls. The reader will note that the predicted C.V.s from some coverage levels over 100% are still greater than 0 (100% would entail a census with a C.V. of zero). This is due to the low numbers of trips with mid-water gear and suggests that to get low C.V.s coverage rates near 100% are necessary.

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Figure 10. Blueback MWT 2009

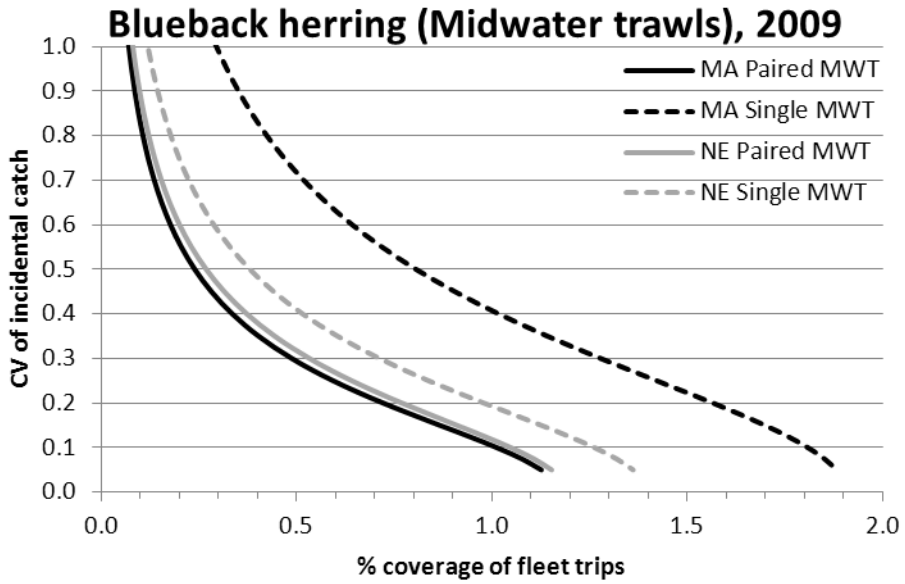


Figure 11. Blueback MWT 2010

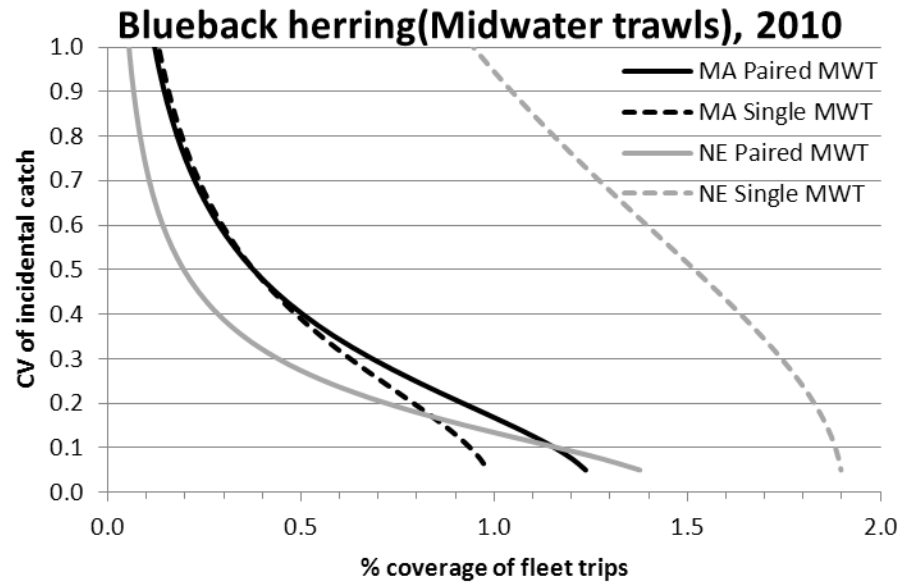


Figure 12. Alewife MWT 2009

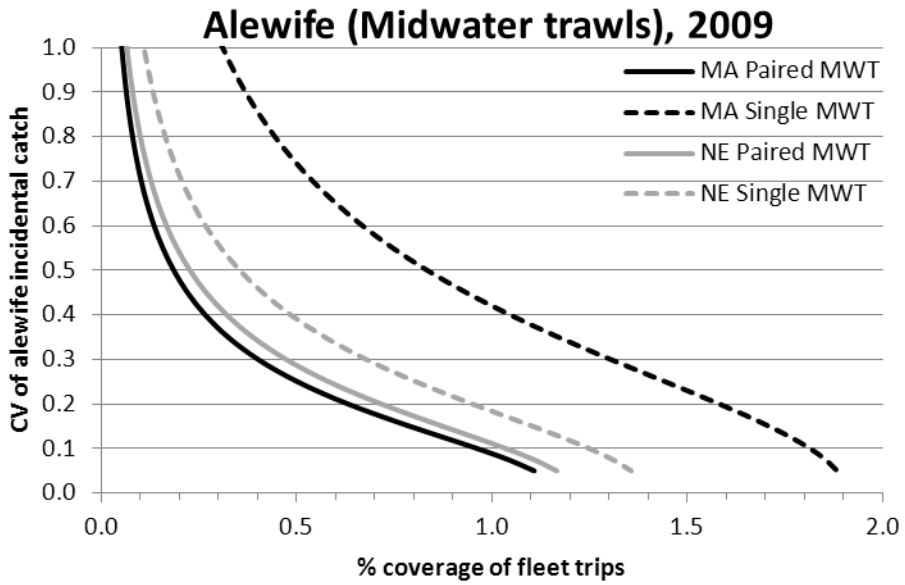
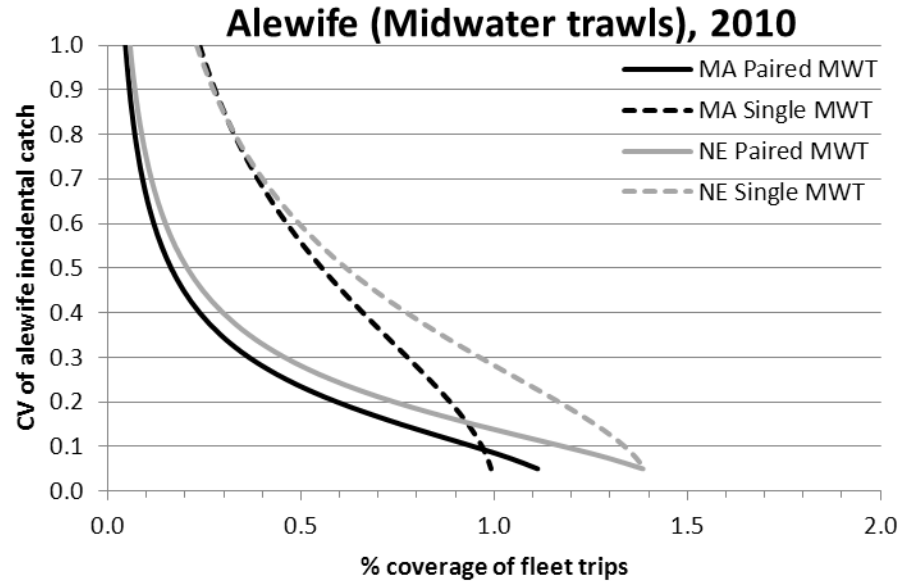


Figure 13. Alewife MWT 2010



While these CV and trip coverage associations are for mid-water trawls and not mackerel trips specifically, they represent the standard methodology used to estimate discards and/or catch (and the associated precision) from observer and landings data. If all other fisheries besides mackerel using these gears also implemented the same percentage coverage, then the described C.V.s may be achieved. However, the Mid-Atlantic Council can only regulate its own fisheries so it is not

possible to describe the C.V.s for these gear types that would result from the various percentage coverage levels for mid-water trawl mackerel trips.

Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on midwater trawl trips that kept 20,000 pounds or more of mackerel. These trips averaged 643 sea days each year ranging from 272 in 2010 to 926 in 2006. If 25%, 50%, 75%, or 100% of the average seadays were observed it would require 161, 322, 482, and 643 days respectivly. Given the low levels of current coverage and an uncertain funding situation, most if not nearly all of these would or could have to be industry funded (see 5f below) if mandated.

Key things to notice are 1) the variability from one year to the next and 2) the variability between fleets (a given percentage coverage results in one C.V. for one fleet and another C.V. for a different fleet). In other words, obtaining a given level of precision (C.V.) in RH/S catch estimates for this gear type will probably require markedly different coverage levels from year to year due to inter-annual variability in the catches. Since the inter-annual variability cannot totally be predicted, it is not really possible to predict the exact C.V.s that any given level of coverage will result in, especially for mackerel fishery requirements given it represents only a portion of mid-water trawl activity.

Waivers would only be granted if an observer could not be obtained because of issues with NMFS or an observer provider (i.e. through no fault of the vessel).

5c. Mackerel Small Mesh Bottom Trawl (SMBT)

A very small percentage of mackerel trips are observed overall. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5c1. Require 25% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c2. Require 50% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c3. Require 75% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c4. Recommend the following observer coverages percentages for mackerel limited access vessels intending to fish for or retain over 20,000 pounds of mackerel when using small mesh (<3.5 inches) bottom trawl gear: Tier 1: 100%; Tier 2: 50%; Tier 3: 25%. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

The double underlined section highlights a modification from the original alternative in the DEIS. 5c4 has been modified to essentially combine 5c1, 5c2, and the original 5c4 by applying higher coverage levels for the higher tier vessels and lower coverage levels for the lower tier vessels. Since the original alternatives considered 25%-100% coverage applied to all mackerel permitted vessels, the modified alternative is within the range and intent of the alternatives considered in the DEIS. The rationale is that the vessels accounting for most mackerel landings should have the highest levels of coverage and other vessels would have coverage in proportion to their potential landings. Require was also changed to recommend since the Council makes recommendations to NMFS.

The following figures illustrate the C.V.'s that would have been expected in 2009 and 2010 for different fleets with different percentages of coverages of trips for small mesh bottom trawls for blueback herring and alewife. Shad catches are low so C.V.s are very high even at high levels of coverage and their curves are not shown. As an illustration of how to read the figures, if you start at the 0.5 mark on the horizontal axis of any of the figures (indicates 50% coverage), and draw a straight line up, the place where it intersects a curve will tell you the expected C.V. for the relevant species (blueback or alewife) and relevant fleet by looking left from the intersection point to the C.V.s on the vertical axis. Overall and as would be expected, as the percentage of covered trips increases, the C.V. falls and precision increases. For example, on figure 14, it is estimated that if a 50% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.1 in Mid-Atlantic small mesh bottom trawls, and of 0.2 in New England small mesh bottom trawls. On the same figure, it is estimated that if a 75% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.075 in Mid-Atlantic small mesh bottom trawls, and of 0.15 in New England small mesh bottom trawls.

Figure 14. Blueback SMBT 2009

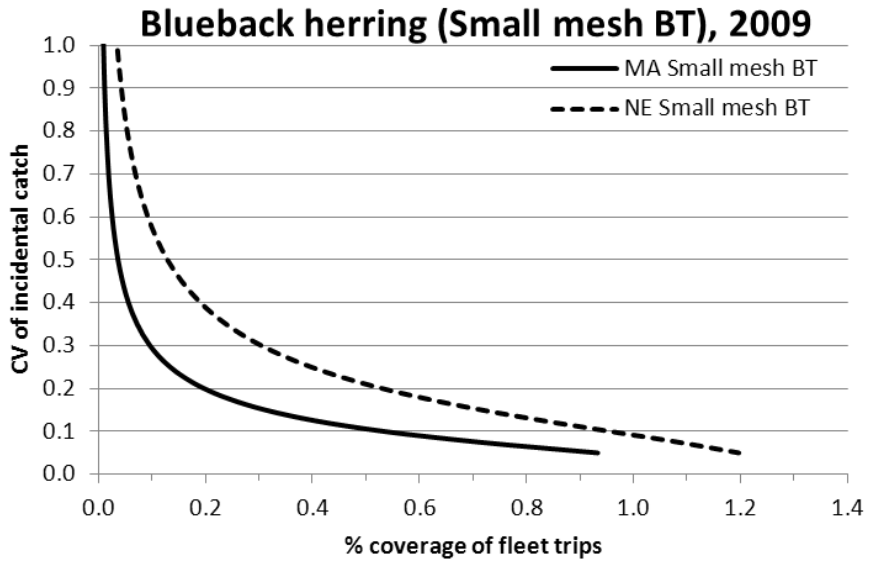


Figure 15. Blueback SMBT 2010

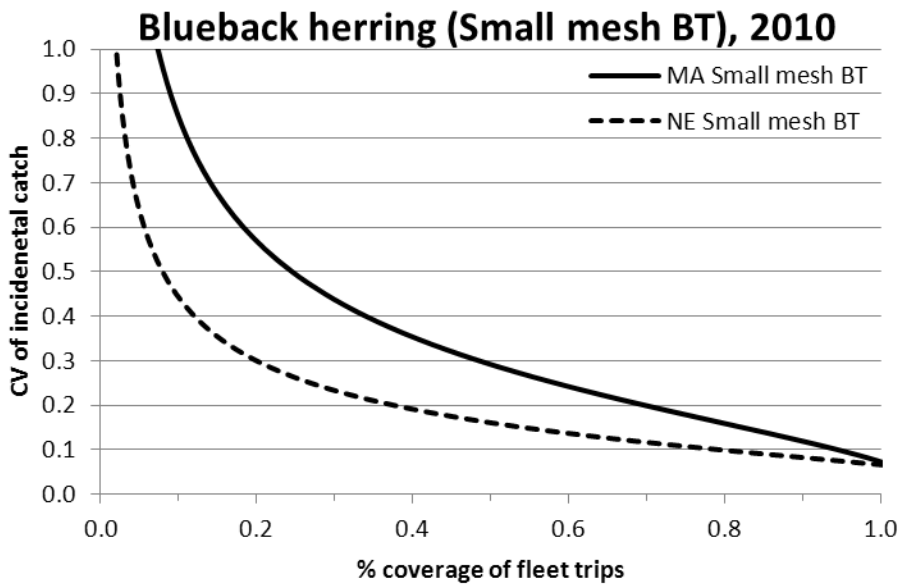


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Figure 16. Alewife SMBT 2009

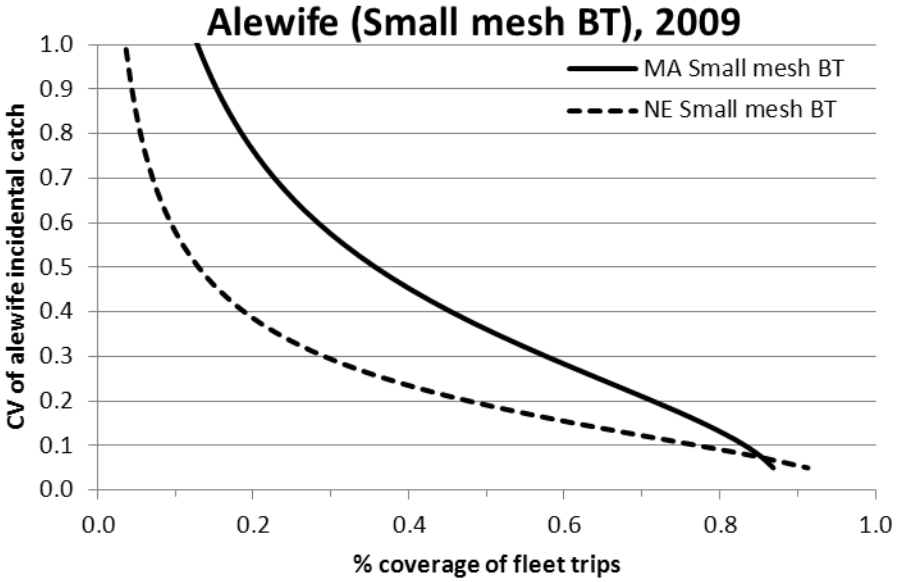
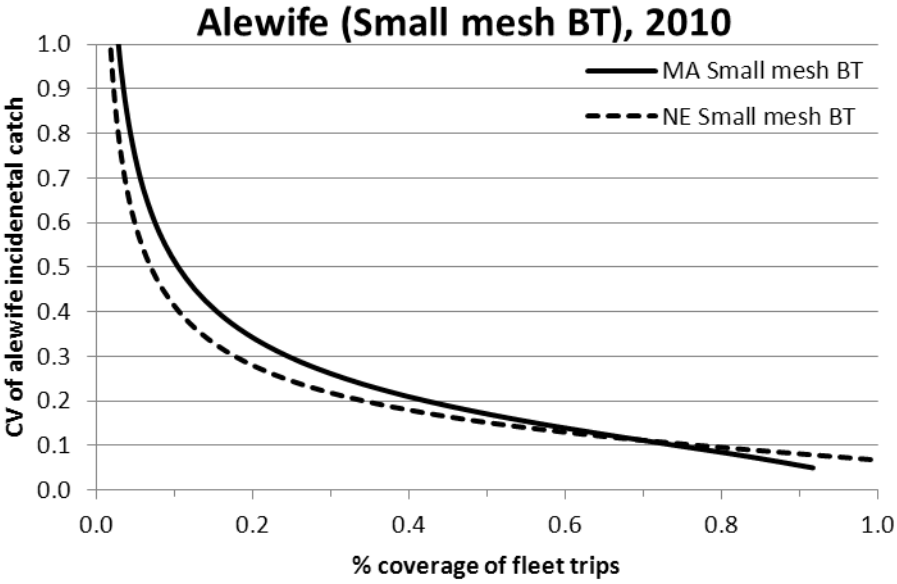


Figure 17. Alewife SMBT 2010



While these CV and trip coverage associations are for small mesh bottom trawls and not mackerel trips specifically, they represent the standard methodology used to estimate discards and/or catch (and the associated precision) from observer and landings data. If all other fisheries besides mackerel using these gears also implemented the same percentage coverage, then the described C.V.s may be achieved. However, the Mid-Atlantic Council can only regulate its own fisheries so it is not possible to describe the C.V.s for these gear types that would result from the various percentage coverage levels for small-mesh bottom trawl mackerel trips.

Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on small mesh bottom trawl trips that kept 20,000 pounds or more of mackerel. These trips averaged 172 sea days each year ranging from 113 in 2009 to 286 in 2006. If 25%, 50%, 75%, or 100% of the average seadays were observed it would require 43, 86, 129, and 172 days respectivly. Given the low levels of current coverage and an uncertain funding situation, most if not nearly all of these would have to be industry funded (see 5f below) if mandated.

Key things to notice are 1) the variability from one year to the next and 2) the variability between fleets (a given percentage coverage results in one C.V. for one fleet and another C.V. for a different fleet). In other words, obtaining a given level of precision (C.V.) in RH/S catch estimates for this gear type will probably require markedly different coverage levels from year to year due to inter-annual variability in the catches. Since the inter-annual variability cannot totally be predicted, it is not really possible to predict the exact C.V.s that any given level of coverage will result in, especially for mackerel fishery requirements given it represents only a small portion of small-mesh bottom-trawl activity.

5d. Longfin Squid Small Mesh Bottom Trawl (SMBT) (The Council chose No Action for the longfin fishery for this measure.)

While coverage has increased in 2011 related to the implementation of the butterfish mortality cap on the longfin squid fishery, a small percentage of longfin squid trips have been observed historically. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5d1. Require 25% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d2. Require 50% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d3. Require 75% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d4. Require 100% of SMBT (<3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

C.V. and percent coverage relationships for small mesh bottom trawl are illustrated in the previous alternative.

The above figures illustrate the C.V.'s that would have been expected in 2009 and 2010 for different fleets with different percentages of coverages of trips for small mesh bottom trawls for blueback herring and alewife. Shad catches are low so C.V.s are very high even at high levels of coverage and their curves are not shown. As an illustration of how to read the figures, if you

start at the 0.5 mark on the horizontal axis of any of the figures (indicates 50% coverage), and draw a straight line up, the place where it intersects a curve will tell you the expected C.V. for the relevant species (blueback or alewife) and relevant fleet by looking left from the intersection point to the C.V.s on the vertical axis. Overall and as would be expected, as the percentage of covered trips increases, the C.V. falls and precision increases. For example, on figure 14, it is estimated that if a 50% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.1 in Mid-Atlantic small mesh bottom trawls, and of 0.2 in New England small mesh bottom trawls. On the same figure, it is estimated that if a 75% trip coverage rate had been achieved, it would have resulted in approximate C.V.s for estimates of catch of blueback herring of 0.075 in Mid-Atlantic small mesh bottom trawls, and of 0.15 in New England small mesh bottom trawls.

While these CV and trip coverage associations are for small mesh bottom trawls and not longfin squid trips specifically, they represent the standard methodology used to estimate discards and/or catch (and the associated precision) from observer and landings data. If all other fisheries besides longfin squid using these gears also implemented the same percentage coverage, then the described C.V.s may be achieved. However, the Mid-Atlantic Council can only regulate its own fisheries so it is not possible to describe the C.V.s for these gear types that would result from the various percentage coverage levels for small-mesh bottom trawl longfin squid trips.

Since coverage in this alternative would be related to 2,500 pound longfin squid trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on small mesh bottom trawl trips that kept 2,500 pounds or more of longfin squid. These trips averaged 5,357 sea days each year ranging from 3,932 in 2010 to 6,743 in 2006. If 25%, 50%, 75%, or 100% of the average seadays were observed it would require 1339, 2678, 4017, and 5,357 sea days respectivly. Given the low levels of current coverage and an uncertain funding situation, most if not nearly all of these might have to be industry funded (see 5f below) if mandated. About 10% of 2,500 pound longfin squid trips were observed in 2011, so up to 10% of these might be funded but such funding is not guaranteed.

Key things to notice are 1) the variability from one year to the next and 2) the variability between fleets (a given percentage coverage results in one C.V. for one fleet and another C.V. for a different fleet). In other words, obtaining a given level of precision (C.V.) in RH/S catch estimates for this gear type will probably require markedly different coverage levels from year to year due to inter-annual variability in the catches. Since the inter-annual variability cannot totally be predicted, it is not really possible to predict the exact C.V.s that any given level of coverage will result in, especially for mackerel fishery requirements given it represents only a portion of small-mesh activity.

5e. Strata-Fleet-Based Alternatives

On a fleet level, catch estimates of river herrings are often imprecise. The following sub-alternatives would require coverage levels that would be expected to result in the specified C.V. levels for river herrings. Shad were not included because very high coverage levels would be required to achieve the respective C.V.s.

5e1. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.30.

5e2. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.20.

5e3. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.30.

5e4. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.20.

These alternatives would require NMFS to allocate sea days to achieve the specified river herring C.V.s. Based on the same analysis as above (in 5b-5c), the sea days required are described in the table below. These are the sea days related to the trips in the figures from those alternatives. Since sea day requirement estimates are based on prior year performance, the requirements for 2009 and 2010 are both provided and they illustrate how different numbers of sea days are required each year to attain a given C.V. The approximate number of executed sea days for each grouping in 2010 is also provided. The difference between the executed number and the required number would be the extra days required. Since the alternatives require C.V.s for both species, the higher value for either blueback herring or alewife was used.

Table 11. Sea days associated with Alt. 5e C.V. targets.

	Mid-Atlantic MWT (CV = 0.3)	Mid-Atlantic MWT (CV = 0.2)	SMBT (CV = 0.3)	SMBT (CV = 0.2)
Required Sea Days (2009)	541	751	3610	4889
Required Sea Days (2010)	308	409	2542	3982
Approx Days Provided in 2010	76		1132	

Since the trip coverage to achieve a given C.V. fluctuates from year-to-year, one can never really guarantee a given C.V. will be reached. It may be quite difficult to consistently obtain precise catch estimates via observer data when the coverage levels are determined from prior years' data for species that are not encountered that often in large quantities. However, the numbers in the table above suggest that around 65% coverage could result in a 0.3 C.V. goal and about 90% coverage could result in a 0.2 C.V. goal for Mid-Atlantic MWT and that for small mesh bottom trawl, around 40% coverage could result in a 0.3 C.V. goal and about 60% coverage could result

in a 0.2 C.V. goal. This was determined by averaging the required sea days from 2009-2010, and then comparing those averages with total average days at sea for relevant trips from VTR data, 2009-2011. However it is emphasized that from year to year it will be very hard to hit a particular C.V. target due to the inherent variability from year to year in both the directed fisheries involved and their catch of river herrings. Since one cannot predict which years will require the highest coverage, some years would likely be over covered and some years would be under covered if coverage rates are determined by the previous year's data. The monetary costs associated with these coverage levels are described in Section 7.

It is important to note that though the percent of coverage needed for small mesh bottom trawl may be lower than mid-water trawl for a given C.V., because of the much greater size of the small mesh bottom trawl fishery fleet (vessels and trips), a much higher number of sea days is required to achieve a given C.V. for small mesh bottom trawl.

A key issue with implementation of this alternative is that while the alternative is based on gear types which is how discard and catch estimates based on observer coverage are binned to get total estimates, the MAFMC can really only compel the fisheries it manages to carry and pay for observers. Since NMFS has indicated that it will only approve additional observer coverage on fisheries if it is funded by industry, and the MAFMC cannot compel fisheries out of its control to carry and pay for observers, there is a procedural tension inherent in this alternative.

What could occur if this alternative is selected, is that NMFS would use its observer allocation procedures to allocate the approximate level of coverage in Mid-Atlantic fisheries that would be needed as part of achieving the overall C.V. targets. So if this alternative was recommended, New England fisheries that use the relevant gear types would not be affected so the C.V. targets would not actually be reached but they would be improved related to increases in Mid-Atlantic fisheries. If New England approved measures consistent with these C.V. targets (including industry funding), the tension would be resolved however as all of the major fisheries with substantial RH catch would be covered.

5f. Vessels would have to pay $325 (modifiable via specifications) for observers when they carry observers to meet the observer coverage goals adopted by the Council in 5b4 and 5c4. NEFSC would accredit observers and vessels would have to contract and pay observers. (PREFERRED)

This alternative represents a modification from the original alternative in the DEIS. In the original alternative, vessels had to pay the full cost of observer days beyond the standard NMFS-established coverage. The Council modified this alternative such that vessels selected for coverage would have to pay $325 per day to fund the overall observer goals. Since the original alternative considered full industry funding of the required observer days, this is within the range between no funding and full funding. The original DEIS analyzed industry paying for 100% of the at-sea cost ($800) of all related observer trips due to the possibility of reduced federal

funding of observers in the future, so having all observed trips pay only $325 lies in between the no action and the original alternative.

NMFS has repeatedly stated that additional federal funding for observers is not available. This option would require that observer coverage on limited access mackerel and/or longfin squid moratorium 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 14 provisions, vessels would be responsible for covering costs associated with contracting service providers for the additional observer coverage.

Non-government service providers could be used for sea sampling in the event that Federal funds are not sufficient to provide the desired level of coverage.

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 notification provisions described in 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 trip. The vessel would be prohibited from fishing for, taking, possessing, or landing more than an incidental amount 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, fax, or email so as to have 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 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 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 (ex., sea scallops). NMFS could also authorize states as service providers if NMFS and the respective state have a memorandum of agreement regarding the collection and handling of data.

If this amendment requires the industry to pay for observer sea days that cannot be funded using Federal resources, the vessel owner/operator/manager would be required to arrange for carrying an observer from one of the service providers approved by NMFS (50 CFR 648.11(h) and (i)). 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 trip. A list of approved service providers will be published on the NMFS/NEFOP website. If a certified observer cannot be procured within 48 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 appropriate, a waiver is to be issued by NMFS within 24 hours.

5g. Phase-in industry funding over 4 years such that to achieve the target coverage selected in 4b-4e above, NMFS would pay for 100%, 75%, 50%, then 25% of the at-sea portion of the specified observer coverage (NOTE: NMFS has indicated this is not feasible from a funding point of view).

This alternative could be selected in addition to 5f to phase-in industry funding over a 4 year period. NMFS would be likely to reject this alternative because of budget constraints.

5h. Require reevaluation of coverage requirement after 2 years to determine if catch rates justify continued expense of continued high coverage rates. (PREFERRED)

The Council would conduct an examination of the results of any higher coverage rates implemented through this action and consider if adjustments to the coverage rates are warranted. Depending on the results and desired actions, subsequent action could be accomplished via specifications, a framework adjustment, or an Amendment as appropriate and include appropriate analysis of impacts.

5.6 Alternative Set 6 - Mortality Caps

5.6.1 Statement of Problem/Need for Action

Catch of RH/S in the MSB fisheries may be negatively impacting RH/S populations. Estimates of current RH/S catches are summarized in Section 6.3 and detailed in Appendix 2. Due to the lack of comprehensive assessments for RH/S it is not possible to determine if current catch levels are, or are not, negatively impacting RH/S stocks.

5.6.3 General Rationale & Background

A cap on a certain fleet/fishery can keep mortality for the fleet/fishery at a certain level. If imprecision of catch estimates is high, the real catch may be substantially above or below any amount attained under a cap. Given the lack of reference points it would be difficult to establish an appropriate cap amount that is meaningfully tied to some impact on RH/S. One would either have to independently figure out how much overall RH catch one wanted and then allocate a portion of that to a cap or one could just look at what various fisheries have caught, and use that information to come up with an amount for a fishery-specific cap. For the mortality cap alternatives, the MSB Monitoring Committee would draft a range of caps for consideration through specifications. They would likely be based on some fraction of total estimated catch of RH/S as estimated in the appendices of this amendment. If an assessment of RH/S provided information on sustainable harvest that information could be used as well. Precision would likely be quite low under the status quo observer/monitoring regime.

A cap would operate much like the butterfish cap currently operates in the longfin squid fishery. As with the butterfish cap, the exact monitoring and extrapolation methodology would be developed during implementation and presented to the Council for comments before the cap became operational. However, the catch ratio would be based on the ratio of RH/S to total retained catch (i.e. landings), as appropriate depending on which, if any, action alternatives were chosen. This ratio comes from observer data in the butterfish cap and in the context of this amendment could come from observer data or potentially also port-side sampling data if implemented in this amendment. Then for a given fishery (mackerel or squid) as defined by trips over the incidental landings limit, the ratio is applied to all landings (from dealer data) by that fishery to extrapolate a total RH/S catch estimate. Technical details may be found in Wigley et al. (2007), with the modification of using “kept+discards” in the numerator rather than just discards since the focus is on total catch. Once the estimate reaches a closure threshold identified by the Council in the specifications process, then landings above an incidental nature (also specified during specifications) would be prohibited. The mortality cap would operate in parallel to monitoring for the directed fishery such that reaching either the closure threshold for the directed fishery or the mortality cap threshold would close the directed fishery.

It would probably make most sense to have a fleet-area cap (e.g., midwater trawls in Mid-Atlantic) rather than using the regulatory definition of a "Mackerel" or "Herring" trip to define vessels that are subject to the cap. In other words, the greatest amount of impact on RH/S catch

reduction would come from the implementation of a joint cap on both the herring & mackerel fleets. If one instituted just a cap on the mackerel fleets, one of two things could happen if the mackerel fishery was closed due to reaching the cap:

One possibility is that the mackerel fishery closes and the exact same fleet continues fishing in the exact same place (Mid-Atlantic Q1) and just retains the Atlantic herring catches and discards mackerel. Since catch per unit effort of the combined species would go down, overall effort could go up, possibly increasing RH/S catch.

Another possibility is that Q1 catches of mackerel and Atlantic herring in the Mid-Atlantic are so mixed that closing mackerel would effectively close herring.

Fleet-area caps are not currently feasible because herring is managed by the New England Fishery Management Council and its Amendment 5 to the Atlantic Herring FMP does not have complementary caps for the herring fishery. Amendment 5 does contain provisions for a cap to be added later and it is possible that the Mid-Atlantic Fishery Management Council could work with the New England Fishery Management Council to implement a joint cap at a later date.

For all of the mortality caps, once the cap or some fraction of the cap is reached (set in specifications) then the fishery would be closed (i.e., all possession would be prohibited) or an incidental trip limit would go into effect (also set in specifications).

It is possible that a single cap for RH/S combined may be used to implement the preferred alternatives 6b and 6c if the Council chooses to do so via the annual specifications.

PREFERRED ALTERNATIVES

Since RH/S catch is greatest in the mackerel fishery, and current analysis suggested that area-based management could not be determined to be an effective measure, the Council recommended mortality caps for RH/S on the mackerel fishery (6b and 6c). The impact of 6b and 6c will depend on what the cap is ultimately set at, and the cap will be set and analyzed through the annual specifications process. These preferred alternatives are designed to directly control RH/S mortality in the MSB fisheries. Additional future mortality caps were also made frameworkable actions (6f).

5.6.4 Management Alternatives

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

Note: Since some of the alternatives below are very similar, they are grouped together for purposes of description.

6a. No-action

Under the no-action alternative, there would be no mortality caps for RH/S in the mackerel and/or longfin squid fisheries. State management of RH/S would continue (see 5.9.2) for state catches. The New England and Mid-Atlantic Fishery Management Council's would continue to consider ways to reduce RH/S catch in their at-sea fisheries (and may implement other conservation measures in this amendment or Amendment 5 to the Atl Herring FMP) but there would be no hard caps on RH/S catch in the mackerel and/or longfin squid fisheries. The longfin squid fishery is currently subject to a mortality cap for butterfish, further described in section 6.7.4 and documents linked to from that section.

6b. Implement a mortality cap for river herrings for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

Annual cap amounts would be evaluated and set during the specifications process (though without comprehensive RH/S assessments it is not possible to determine if any particular quantity of RH/S catch is sustainable). The specifications process would also set the percentage that a cap closed at to avoid overages (probably 80% to 90%) as well as any incidental trips limits after a closure (probably 0 - 20,000 pounds – 20,000 pounds is the current post-closure incidental trip limit).

One way to assign mortality caps for river herring (and one which illustrates the potential effects or a range of cap levels) would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl (MWT) fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 35% of total river herring mortality 2005-2010. MWT fishing in Quarter 1 is mixed, with mackerel comprising over 50% of the landings, but herring making up a large amount of landings in January (see Figure 21A of Appendix 2). The table below describes total ocean and Quarter 1 mid-water trawl mortalities.

Table 12. Example River Herring Caps for Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (35% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.86%	Mackerel would close at these landings (mt) with mean ratio, 0.45%	Mackerel would close at these landings (mt) with low ratio, 0.02%
2006	245	86	9,975	19,063	428,908
2007	664	232	27,029	51,656	1,162,263
2008	672	235	27,333	52,237	1,175,335
2009	361	126	14,679	28,053	631,190
2010	244	85	9,911	18,940	426,160

Using the ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual river herring mortality ratios from 0.02% in 2007 to .86% in 2009 with a mean of 0.45. The 50%/100,000 filter was used because it has been the way directed mackerel trips have been identified in recent specifications analyses and because this definition encompasses almost all landings. The exact definition of a mackerel trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the mackerel fishery was shut down by the river herring mortality cap is illustrated on the three rightmost columns in the above table (these can be compared to recent mackerel landings detailed in Section 6.7.1). A high ratio means that more river herring were caught and a low ratio means that less river herring were caught. The examples in the above table come for observed data 2006-2010. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the mackerel availability was. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season.

For example in the above table, in 2010 it was estimated that Quarter 1 MWT river herring mortality was 85mt. If an 85mt cap was used, and the fishery experienced a high river herring catch ratio of 0.86%, the cap would be used up when mackerel trips had caught about 9,911 mt of fish. If lower ratios were observed, then more fish could be caught by the mackerel fishery before it was closed by a cap. Likewise, if the cap was set higher, then more fish could be caught by the mackerel fishery before it was closed by a cap.

6c. Implement a mortality cap for shads for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

Annual cap amounts would be evaluated and set during the specifications process. The specifications process would also set the percentage that a cap closed at to avoid overages (probably 80% to 90%) as well as any incidental trips limits after a closure (probably 0 - 20,000 pounds – 20,000 pounds is the current post-closure incidental trip limit).

One way to assign mortality caps for shad (and one which illustrates the potential effects or a range of cap levels) would be to base it on the range of estimated shad mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 12% of total shad mortality 2005-2010. The table below describes total ocean and quarter 1 mid-water trawl mortalities in the leftmost columns (2006 omitted because of lack of shad records).

Table 13. Example Shad Caps for Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (12% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.05%	Mackerel would close at these landings (mt) with mean ratio, 0.03%	Mackerel would close at these landings (mt) with low ratio, 0.004%
2007	60	7	14,364	23,940	179,550
2008	60	7	14,450	24,084	180,630
2009	70	8	16,903	28,172	211,290
2010	47	6	11,338	18,896	141,720

Using the ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual shad mortality ratios from 0.004% in 2009 to 0.05% in 2007 with a mean of 0.03. The 50%/100,000 filter was used because it has been the way directed mackerel trips have been identified in recent specifications analyses and because this definition encompasses almost all landings. The exact definition of a mackerel trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the mackerel fishery was shut down by the shad mortality cap is illustrated on the rightmost three

columns in the above table (these can be compared to recent mackerel landings detailed in Section 6.7.1). A high ratio means that more shad were caught and a low ratio means that less shad were caught. The examples in the above table come for observed data 2006-2010. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the mackerel availability was. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season.

For example in the above table, in 2010 it was estimated that quarter 1 MWT shad mortality was 6mt. If an 6mt cap was used, and the fishery experienced a high shad catch ratio of 0.05%, the cap would be used up when mackerel trips had caught about 11,338 mt of fish. If lower ratios were observed, then more fish could be caught by the mackerel fishery before it was closed by a cap. Likewise, if the cap was set higher, then more fish could be caught by the mackerel fishery before it was closed by a cap.

6d. Implement a mortality cap for river herrings for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (The Council chose No Action for the longfin fishery for this measure.)

Annual cap amounts would be evaluated and set during the specifications process. The specifications process would also set the percentage that a cap closed at to avoid overages (probably 80% to 90%) as well as any incidental trips limits after a closure (probably 2,500 pounds, the current incidental trip limit). Since the longfin squid fishery operates by four-month trimesters, the Council could choose to allocate a cap by trimesters as well, and this would be evaluated during specifications.

One way to assign mortality caps for river herring (and one which illustrates the potential effects or a range of cap levels) would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 5% of total river herring mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 5% of total mortalities in the leftmost columns.

Table 14. Example River Herring Caps for Longfin

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.17%	Longfin squid would close at these landings (mt) with mean ratio, 0.06%
2006	245	12	7,233	20,424
2007	664	33	19,534	55,346
2008	672	34	19,754	55,968
2009	361	18	10,608	30,057
2010	244	12	7,162	20,293

Using the ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid results in annual river herring mortality ratios from almost zero in 2007 to .17% in 2009 with a mean of 0.06%. The 2,500 pound filter was used because it has been the way directed longfin squid trips have been identified in the butterfish cap for the longfin squid fishery and because is encompasses almost all longfin squid landings. The exact definition of a longfin squid trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the river herring mortality cap is illustrated on the rightmost columns in the above table (these can be compared to recent longfin squid landings detailed in Section 6.7.4). A high ratio means that more river herring were caught and a low ratio means that less river herring were caught. The examples in the above table come for observed data 2006-2010. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the longfin squid availability was. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season.

For example in the above table, in 2010 it was estimated that Mid-Atlantic small mesh bottom trawl river herring mortality was 12mt. If a 12mt cap was used, and the fishery experienced a high river herring catch ratio of 0.17%, the cap would be used up when longfin squid trips had caught about 7,162 mt of fish. If lower ratios were observed, then more fish could be caught by the longfin squid fishery before it was closed by a cap. Likewise, if the cap was set higher, then more fish could be caught by the longfin squid fishery before it was closed by a cap.

6e. Implement a mortality cap for shads for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (The Council chose No Action for the longfin fishery for this measure.)

Annual cap amounts would be evaluated and set during the specifications process. The specifications process would also set the percentage that a cap closed at to avoid overages (probably 80% to 90%) as well as any incidental trips limits after a closure (probably 2,500 pounds, the current incidental trip limit). Since the longfin squid fishery operates by four-month trimesters, the Council could choose to allocate a cap by trimesters as well, and this would be evaluated during specifications.

One way to assign mortality caps for shad (and one which illustrates the potential effects or a range of cap levels) would be to base it on the range of estimated shad mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 11.5% of total shad mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 11.5% of total mortalities in the leftmost columns.

Table 15. Example Shad Caps for Longfin

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (11.5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.21%	Longfin squid would close at these landings (mt) with mean ratio, 0.10%	Longfin squid would close at these landings (mt) with low ratio, 0.03%
2006	47	5	2,587	5,433	18,109
2007	60	7	3,278	6,883	22,943
2008	60	7	3,297	6,924	23,081
2009	70	8	3,857	8,099	26,998
2010	47	5	2,587	5,433	18,109

Using the ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid results in annual shad mortality ratios from almost 0.03% in 2009 to 0.21% in 2010 with a mean of 0.10%. The 2,500 pound filter was used because it has been the way directed longfin squid trips have been identified in the butterfish cap for the longfin squid fishery and because is encompasses almost all longfin squid landings. The exact definition of a longfin squid trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the shad mortality cap is illustrated on the rightmost columns in the above table (these can be compared to recent longfin squid landings detailed in Section 6.7.4). A high ratio means that more shad were caught and a low ratio means that less shad were caught. The examples in the above table come for observed data 2006-2010. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the longfin squid availability was. Since the realized ratio can vary substantially from year to year, it is not possible to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season.

For example in the above table, in 2010 it was estimated that Mid-Atlantic small mesh bottom trawl shad mortality was 5mt. If a 5mt cap was used, and the fishery experienced a high shad catch ratio of 0.21%, the cap would be used up when longfin squid trips had caught about 2,587 mt of fish. If lower ratios were observed, then more fish could be caught by the longfin squid fishery before it was closed by a cap. Likewise, if the cap was set higher, then more fish could be caught by the longfin squid fishery before it was closed by a cap.

6f. Add mortality caps to list of measures that can be frameworked. (PREFERRED)

This alternative would allow the kinds of mortality caps considered in this document to be re-considered and implemented at a future time via a streamlined framework amendment process. Such an action would be justifiable because it would be part of an existing overall strategy to reduce RH/S catches. Additional analysis will be competed if and when additional frameworks are initiated.

5.7 Alternative Set 7 – Restrictions in areas of high RH/S catch

5.7.1 Statement of Problem/Need for Action

Catch of RH/S in the mackerel and longfin squid fisheries may be negatively impacting RH/S populations. There are state possession limits and landings requirements but there are currently no limits on catch of RH/S in Federal fisheries. National Standard 9 mandates that the Council reduce discards to the extent practicable and MSA provides discretionary authority for the Council to reduce non-target RH/S catch in the mackerel and longfin squid fisheries (see Section 4). Area-based restrictions could be a way of reducing RH/S catch in these fisheries.

5.7.2 General Rationale & Background

The Council originally hoped to include some alternatives that would restrict fishing in relatively small areas that appeared to be "hotspots" for RH/S catch. Based on NMFS NEFSC analysis the Amendment's Fishery Management Action Team's found that because of the wide and variable distribution of RH/S, small-area management is unlikely to be successful (Appendices 1-2 and summary of RH/S catch analysis in Section 6.3). Because the Council instructed the FMAT to generate area-based alternatives that would be likely to provide protection to RH/S, the FMAT generated several area alternatives that cover very large areas, but acknowledged that such large-scale area restrictions could, in some alternatives, effectively close the fisheries for many participants. Council staff attempted to perform additional smaller-scale examinations of the data (for example around Hudson Canyon) but at such small scales there are too few observations to draw meaningful conclusions about the potential of small-scale area restrictions for reducing RH/S encounters.

Staff also investigated if small areas in federal waters but near major river mouths might be an appropriate strategy. However, little is known about fine scale migration patterns once RH/S are in the ocean and there is no evidence that there are staging aggregations (schools of RH/S near river mouths) in federal waters that would lend themselves to such approaches (pers com K. Taylor, ASMFC, W. Laney, U.S. Fish and Wildlife Service).

The FMAT analysis suggests that because of the spatial and temporal variability of observed (Northeast Fishery Observer Program or "NEFOP") RH/S catch, the same kind of variability in mackerel and longfin squid effort and catch, and the same kind of variability in RH/S NEFSC trawl survey catches, that very large areas would be required to ensure that management was not just redistributing effort, possibly in a way that even increased RH/S catch. For this reason Council staff used the FMAT GIS analysis (Appendix 2) to construct areas for mackerel and longfin squid based on the mid-water and small-mesh bottom trawl fleet effort data and RH/S catch data. The table below is designed to help illustrate how even if you reduce catch rates of one species, for example blueback, but reduce catch rates of the directed species (for example mackerel) even more, it can be possible to do more harm than good if the fleet increases effort to maintain the same amount of harvest. For example if blueback catches were "a little lower" but mackerel catches were "a lot lower" and the fleet increased effort in response, a large increase in

effort could result in higher total blueback catches even if the rate of blueback catches declined somewhat. Since the relative changes in catch rates are not possible to predict currently, one cannot predict the impact on RH/S catches of small area closures for directed mackerel and/or longfin squid fisheries. To clarify, in the table below "good" means a net reduction of blueback catch, "negligible" means no appreciable change, and "bad" means a net increase in blueback catch. The general point is that if RH/S catch rates are reduced but targeted species catch rates are reduced more, the net effect (because of more overall effort) may be bad for RH/S.

Table 16. Direct/Non-Target Impact Schematic

Effects on RH catch of moving effort assuming effort changes to maintain constant mackerel catch if CPUE changes

	Mackerel			
Blueback	CPUE Changes	neutral	a little lower	a lot lower
	neutral	negligible	bad	bad
	a little lower	good	negligible	bad
	a lot lower	good	good	negligible

So the question then becomes can one quantify what would happen to the target and non-target catch if effort is shifted because of a closed area. The results of analyses to-date (spatial-temporal effort variability, spatial-temporal directed catch variability, spatial-temporal RH/S catch variability (observer data), and spatial-temporal catch variability of RH/S in the NEFSC spring and fall bottom trawl surveys) all suggest that it is not currently possible to determine whether any small closed area would lead to LESS, the SAME, OR MORE RH/S catch. To implement area-based management, a very large area would need to be used, and it would need to also encompass different areas seasonally to incorporate the herring fishery to be effective, to know that positive impacts resulted for RH/S (probably not practicable if also trying to maintain some portion of a directed fishery).

At one point in amendment development council technical staff considered recommending to the Council that these area-based measures be removed from the document. However, this recommendation was ultimately not made analyzing these measures does help illustrate the difficulties of dealing with RH/S encounters with an area-based approach.

To create easy to understand and reasonably enforceable areas, simple rectangles were used. In application, the closures would only apply in federal waters within those rectangles.

PREFERRED ALTERNATIVES

Since area-based management could not be determined to be an effective measure, the Council recommended no action for all alternatives in this alternative set.

5.7.3 Management Alternatives

NOTE ON COMBINATIONS: 7bMack and 7cMack are mutually exclusive – the Council could close the area to directed fishing (7bMack) or require observers (7cMack) but not both. Likewise 7bLong and 7cLong are mutually exclusive – the Council could close the area to directed fishing (7bLong) or require observers (7cLong) but not both. One of the mackerel alternatives (either 7bMack or 7cMack) could be combined with one of the longfin squid alternatives (either 7bLong or 7cLong) however. 7d could be added to any 7b or 7c alternative to make those provisions only applicable after a cap-based trigger was reached. The Council would have to specify in this case that the Alternative Set 6 cap trigger was only a trigger for Alternative Set 7 rather than a stand-alone cap measure. 7e could be chosen in addition to any other alternative in this Alternative Set.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (7cMack and 7cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

7a. No-action regarding large closed areas (PREFERRED)

Under the no-action alternative, there would be no area-based restrictions on the mackerel and/or longfin squid fisheries that are designed to reduce catch of RH/S. State management of RH/S would continue (see 5.9.2) for state catches. The New England and Mid-Atlantic Fishery Management Council's would continue to consider ways to reduce RH/S catch in their at-sea fisheries (and may implement other conservation measures in this amendment or Amendment 5 to the Atl Herring FMP) but there would be no area-based restrictions on the mackerel and/or longfin squid fisheries that are designed to reduce catch of RH/S. There are other area-based closures for bottom trawling already in effect (e.g. black and yellow dashed areas on figures 18-20) related to catch of other fish, habitat, or other issues and these restrictions would remain in effect. Details and charts for existing area-based restrictions may be found at: http://www.nero.noaa.gov/nero/fishermen/charts.html. Some alternatives in the set would

require additional observer coverage but under the no-action alternative the current observer coverage levels would continue (see 5.5.2 and 5.5.3).

<u>7bMack</u>. Closed Area - Prohibit retention of more than 20,000 pounds of mackerel in RH/S Mackerel Management Area (applies in quarter 1 only – see map below) for vessels with federal mackerel permits.

The RH/S Mackerel Management Area (see figure below) encompasses most quarter-one mid-water trawl effort as well as most quarter-one observer data observations of RH/S catch, which are estimated to account for 35% of total RH/S catch (See Appendix 2). This alternative would close this area to directed mackerel fishing.

<u>7bLong</u>. Closed Area - Prohibit retention of more than 2,500 pounds longfin squid in RH/S Longfin Squid Management Area (applies year-round – see maps below) for vessels with federal longfin squid moratorium permits.

The RH/S Longfin Squid Management Area encompasses most small mesh bottom trawl effort, which is responsible for 24% of RH/S catch (see Appendix 2). This alternative would close this area to directed longfin squid fishing.

<u>7cMack.</u> Require observers in RH/S Mackerel Management Area (applies in quarter 1 only – see map below) for vessels with federal mackerel permits to retain more than 20,000 pounds of mackerel. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

The RH/S Mackerel Management Area (see figure below) encompasses most quarter-one mid-water trawl effort as well as most quarter-one observer data observations of RH/S catch, which are estimated to account for 35% of total RH/S catch. This alternative would close this area to directed mackerel fishing unless vessels paid to take an observer along if federal funding for an observer was not available. See alternative 5f for funding/operational details.

If an overall observer coverage requirement in Alternative Set 5 was selected but did not result in a trip covered by an alternative in this Alternative Set having an observer, this Alternative Set would effectively require additional coverage.

<u>7cLong.</u> Require observers in RH/S longfin squid Management Area (applies year round) for vessels with federal longfin squid permits to possess more than 2,500 pounds of longfin squid. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

The RH/S Longfin Squid Management Area encompasses most small mesh bottom trawl effort, which is responsible for 24% of RH/S catch. This alternative would close this area to directed longfin squid fishing unless vessels paid to take an observer along if federal funding for an observer was not available. See alternative 5f for funding/operational details.

If an overall observer coverage requirement in Alternative Set 5 was selected but did not result in a trip covered by an alternative in this Alternative Set having an observer, this Alternative Set would effectively require additional coverage.

7d. Make above requirement(s) in effect only when a mortality cap "trigger" is reached. Operation of a "trigger" would be identical to the operation of a mortality cap (see Alternative Set 6 above) but the consequence of hitting the cap would be implementing 7b and/or 7c above if this alternative is selected in conjunction with 7b and/or 7c above. Trigger levels would be specified annually via specifications.

This option would use a mortality cap but instead of shutting down the fishery either the closed area or 100% observer coverage requirements in this Alternative Set would go into force. This alternative could only be selected in conjunction with 7b and/or 7c above. Alternative Set 6 above describes how a mortality cap would work.

7e. Stipulate that any areas designated in Amendment 14 would be considered for updating every other year in specifications considering the most recent data available when specifications are developed.

This alternative would commit the Council to re-evaluate the designated areas every other year during the specifications process. The impacts of any potential revised areas will be evaluated in the NEPA documentation for the annual specifications that considered the changes

Figure 18. RH/S Mackerel Management Area

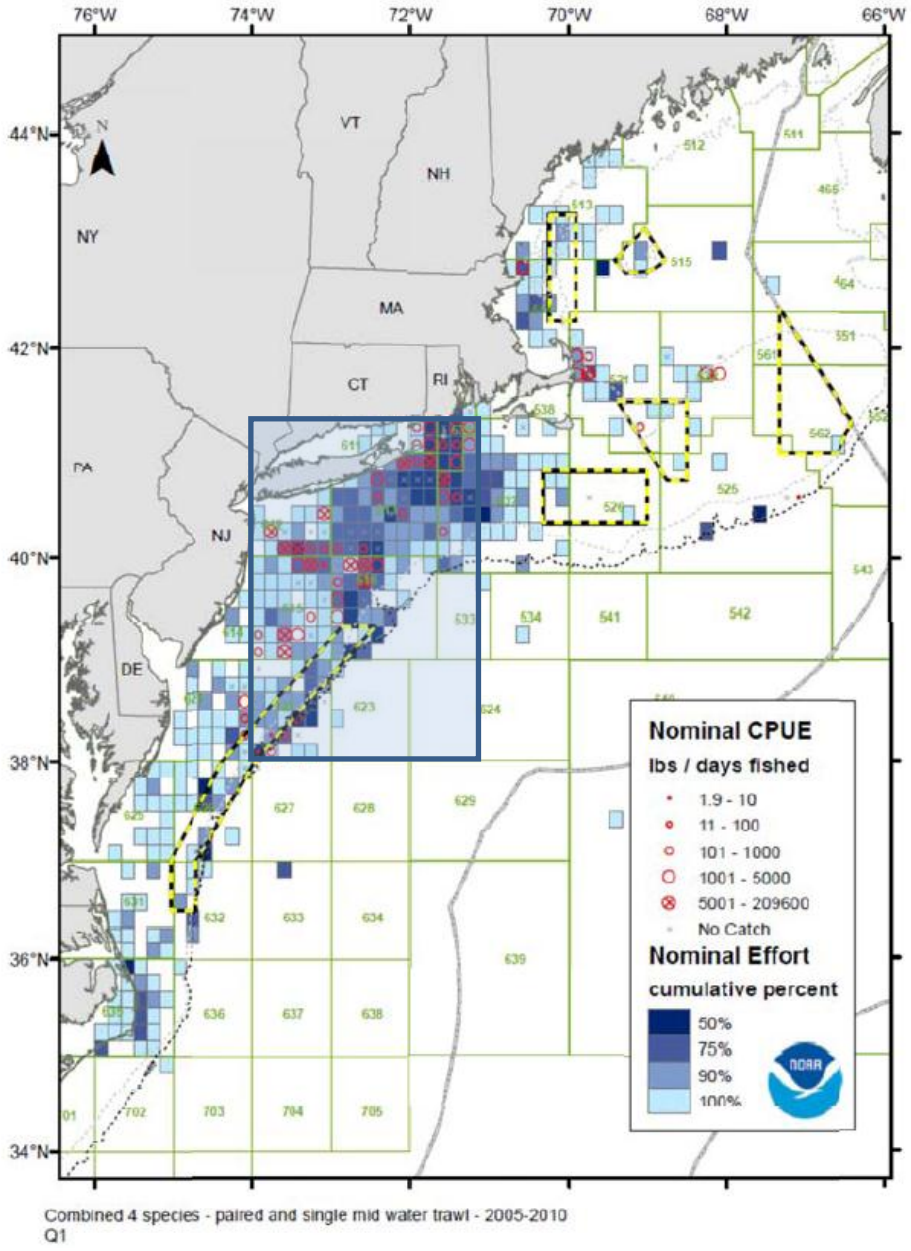


Figure 19. RH/S longfin squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 1 and 2)

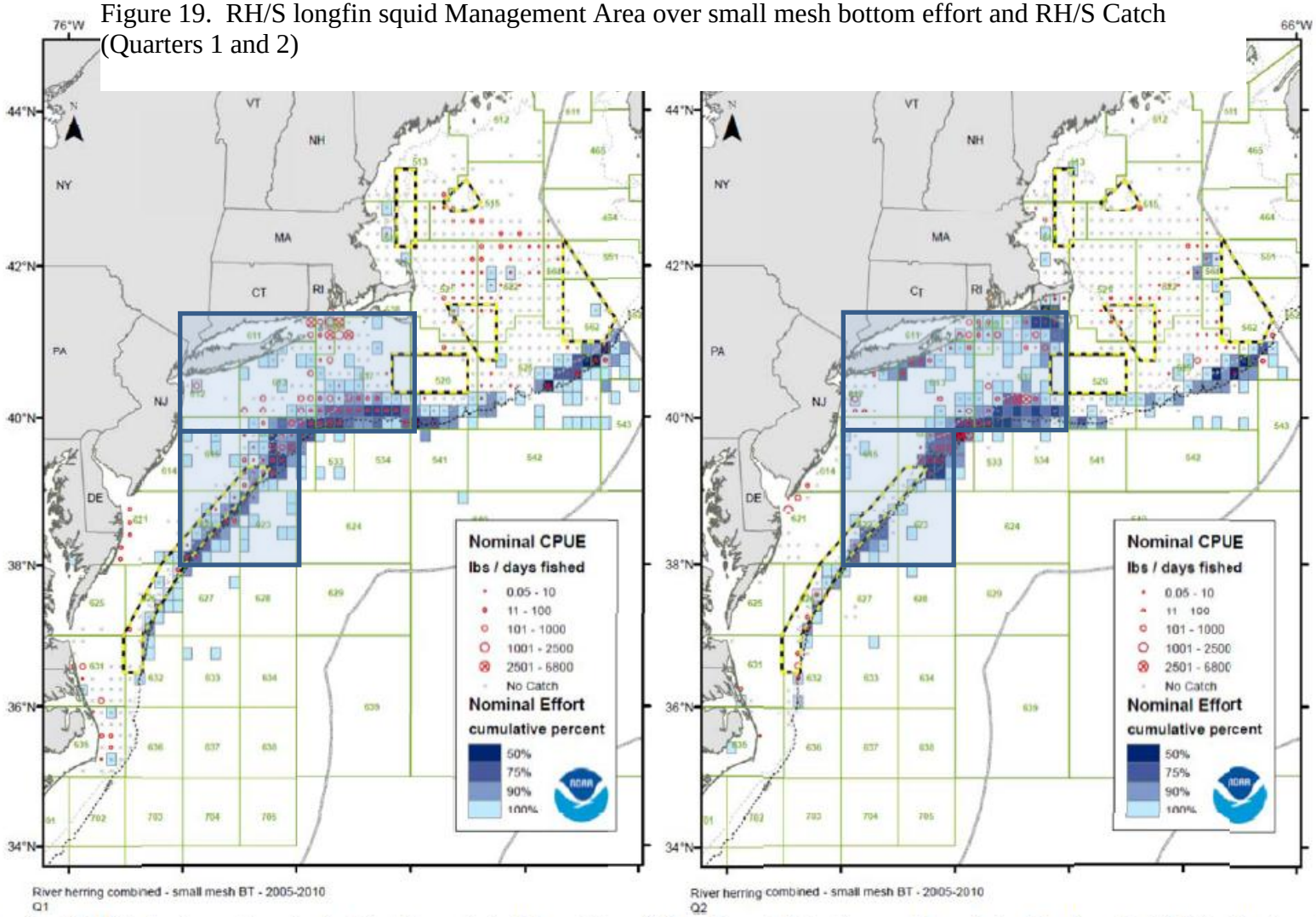


Figure 33. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 1 (left) and 2 (right) for 2005-2010.

Figure 20. RH/S Longfin Squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 3 and 4)

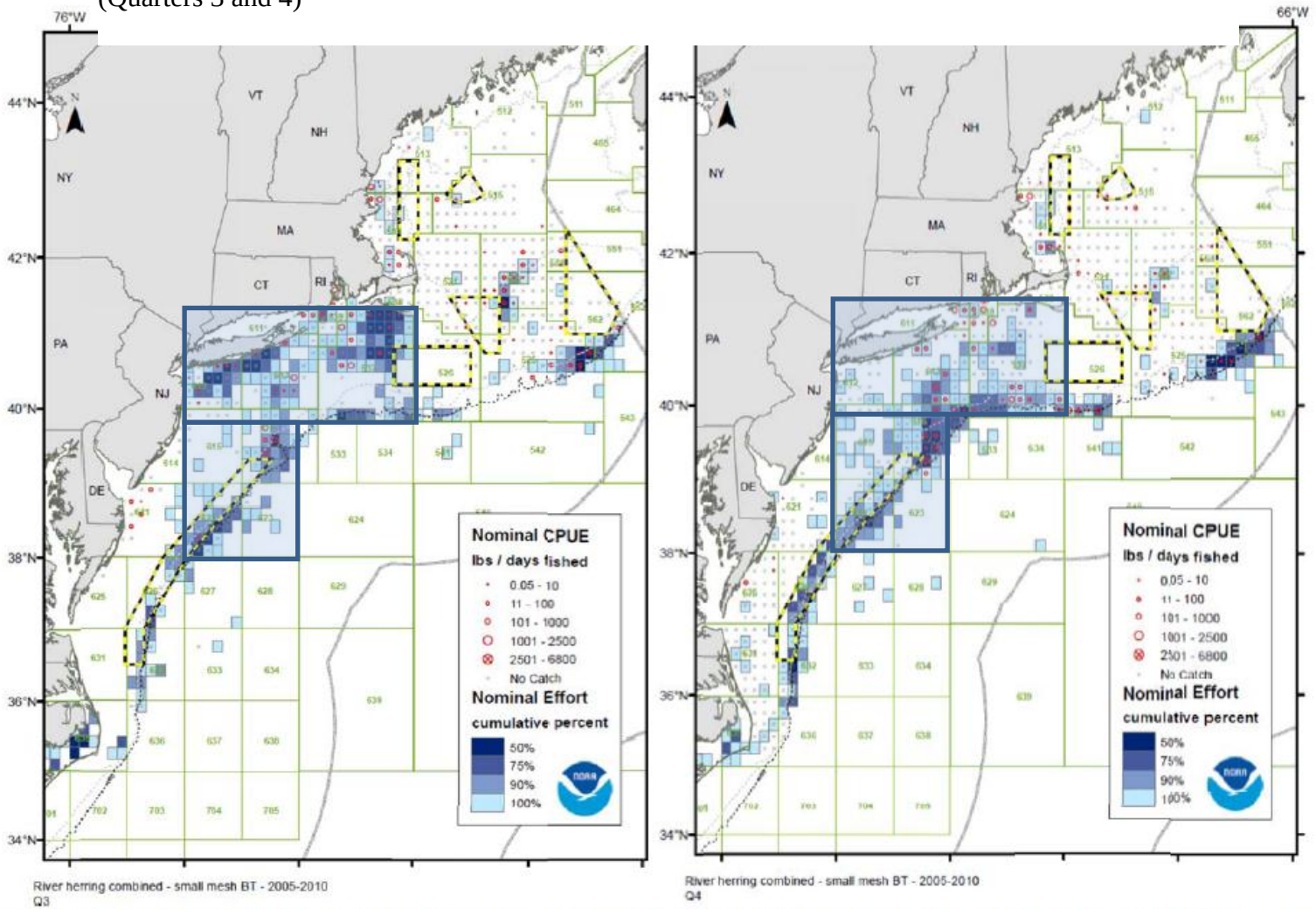


Figure 34. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 3 (left) and 4 (right) for 2005-2010.

5.8 Alternative Set 8 – Hotspot Restrictions

5.8.1 Statement of Problem/Need for Action

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements

5.8.2 General Rationale & Background

The New England Fishery Management Council developed a variety of "Hotspot" alternatives in Amendment 5 to the Atlantic Herring Plan. All of the areas contemplated are relatively small and consider different restrictions within the hotspots. Since Atlantic herring and mackerel are often targeted by the same vessels and are sometimes targeted together at the same time, it makes sense to consider these alternatives even though they were based on observer data from "herring trips" as defined below. This would help ensure consistency among vessels targeting mackerel and Atl. herring.

The smallest areas are termed "River Herring **Protection Areas**." These Protection Areas were 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 during the respective 2-month period. The protection areas include just the portion of the monitoring/avoidance areas (described below) that have the highest river herring catches on Atlantic herring trips as defined above. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Protection Area versus other areas in a given year.

Slightly larger areas are termed "River Herring **Monitoring/Avoidance Areas**." These Monitoring/Avoidance Areas were 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 during the respective 2-month period. They include all of the area identified in the protection areas as well is areas where a more modest amount of river herring was caught. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Monitoring/Avoidance Areas versus other areas in a given year.

These protection and monitoring/avoidance areas are mapped below by their respective bi-monthly periods. Since seeing them on the same page clarifies the differences among the areas, they are illustrated together below (where applicable). Management measures that could apply to these areas follow the maps.

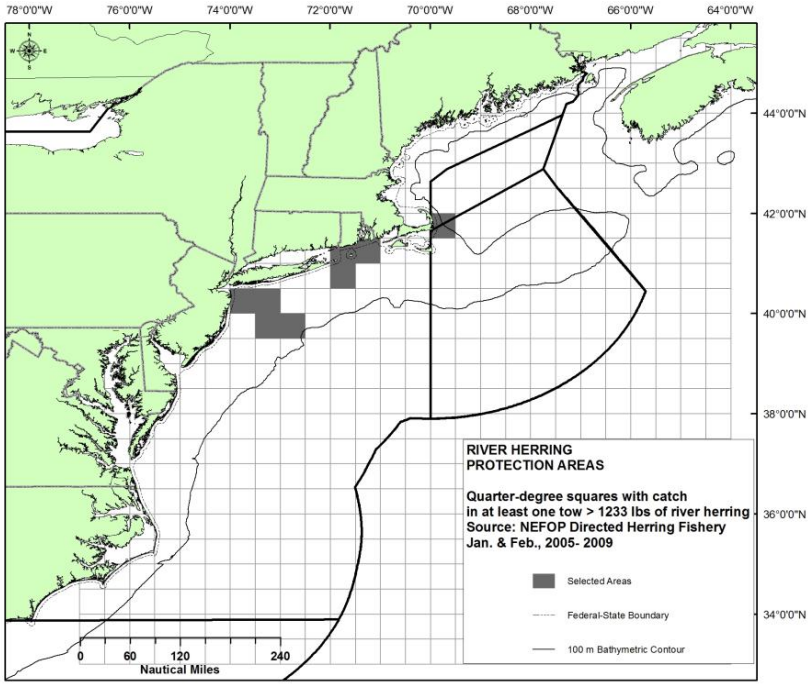
PREFERRED ALTERNATIVES

Since area-based management could not be determined to be an effective measure, the Council only recommended that hotspot measures as contemplated in this alternative set be made frameworkable so that expedited actions could be taken in the future if appropriate.

5.8.3 Management Alternatives

Figure 21. January – February Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

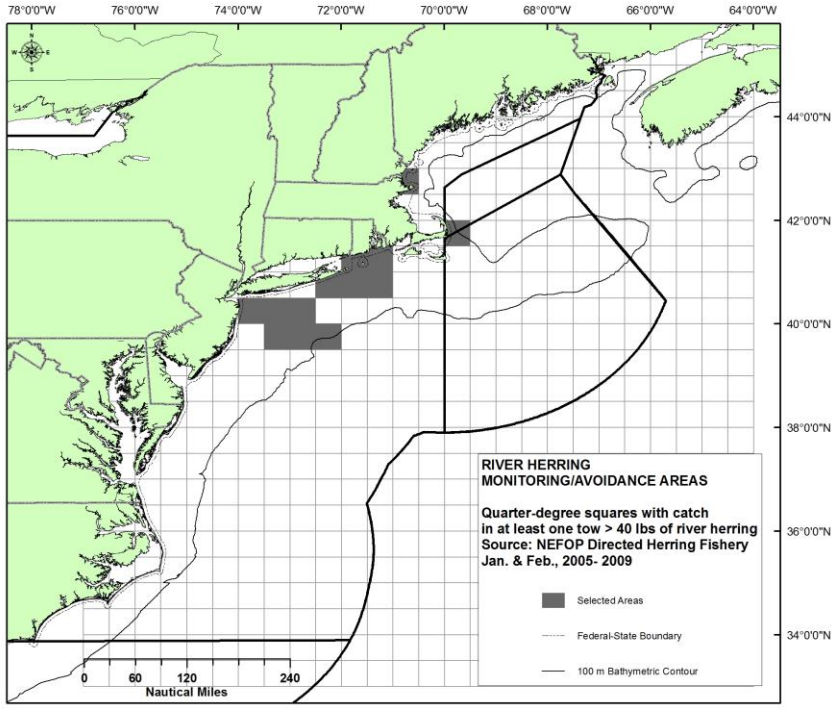
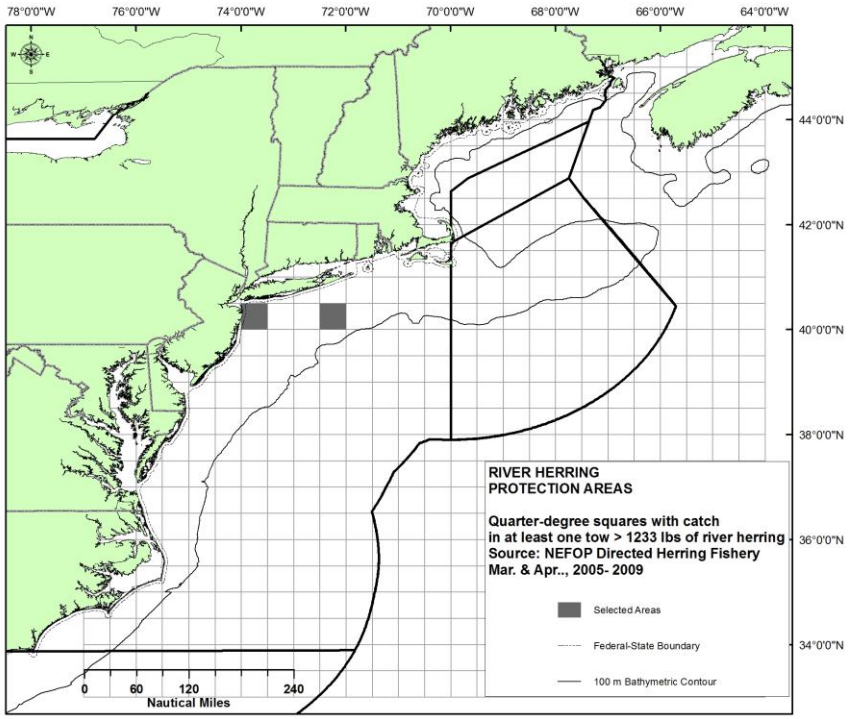


Figure 22. March – April Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

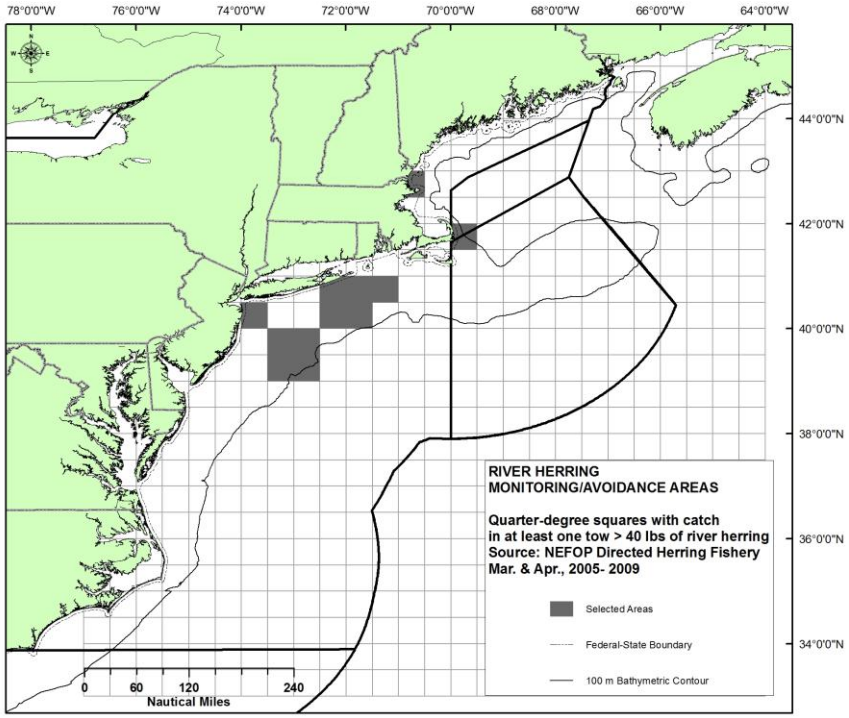


Figure 23. May – June Herring Area

Protection Area

None proposed – there were no qualifying observer records (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).

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Monitoring/Avoidance Area

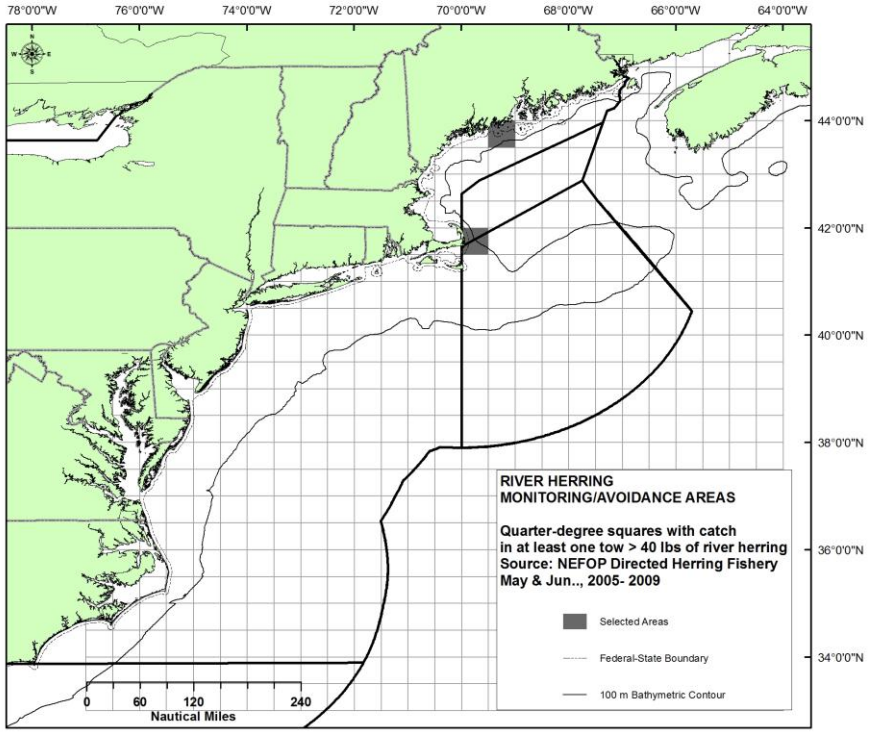

Figure 24. July – August Herring Area

Protection Area

None proposed – there were no qualifying observer records (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).

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Monitoring/Avoidance Area

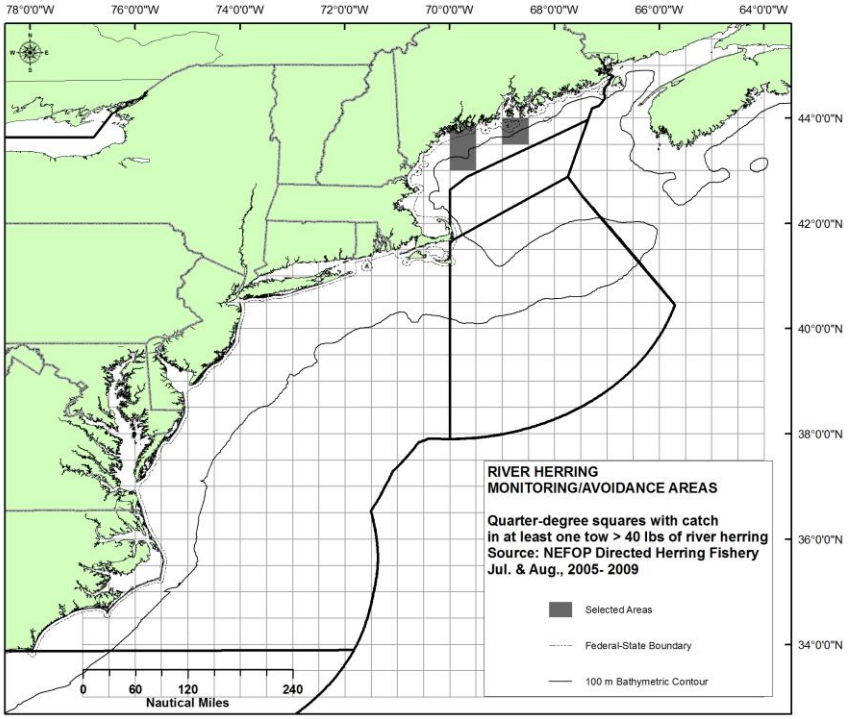
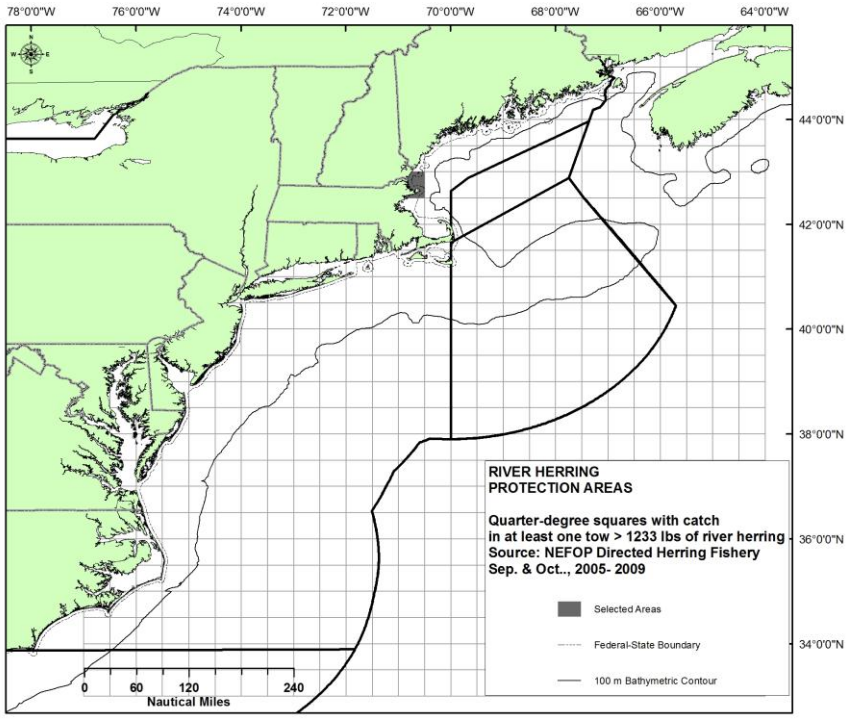


Figure 25. September – October Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

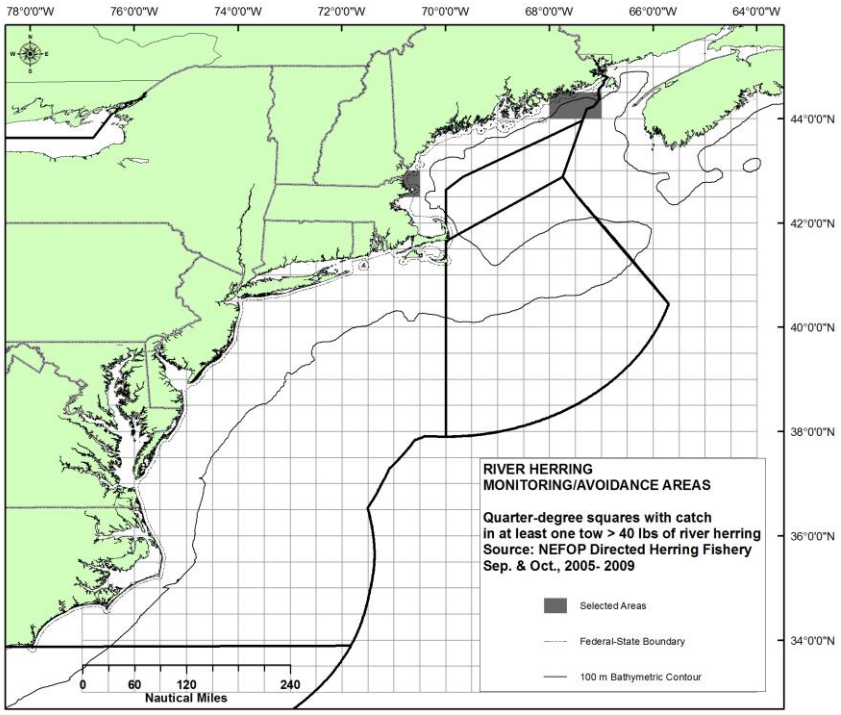
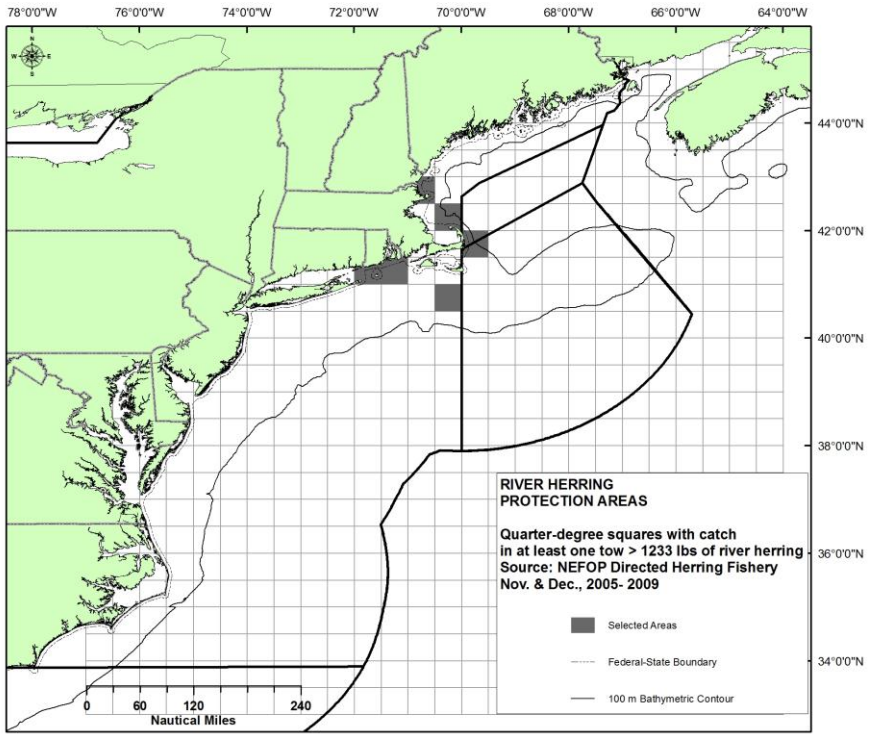
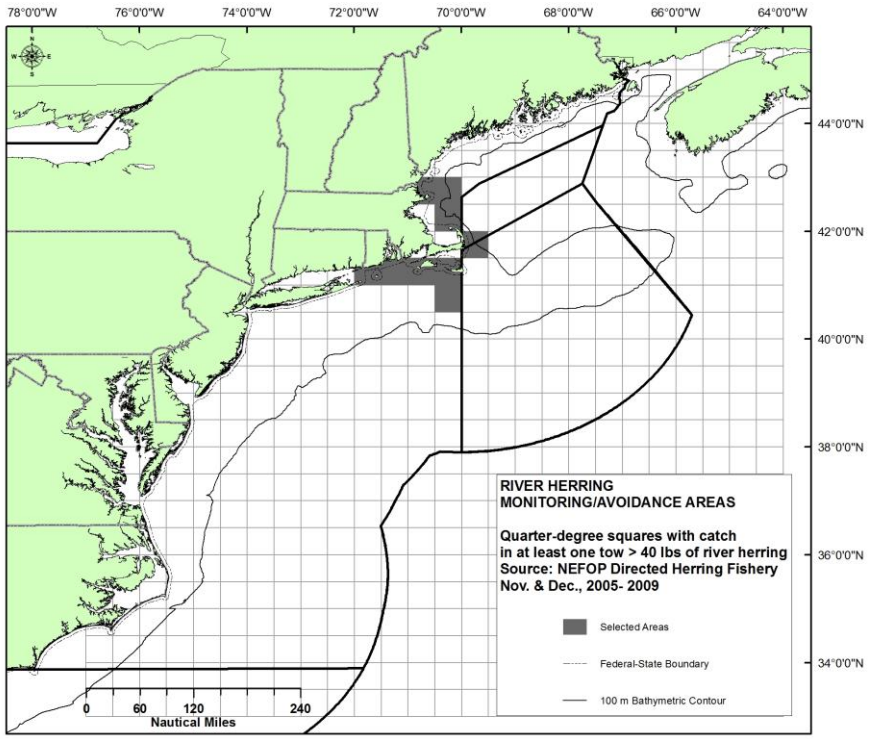


Figure 26. November – December Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area



Management Measures

NOTE ON COMBINATIONS: All of the action alternatives in the set could be adopted individually or together. 8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (8cMack and 8cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

If an overall observer coverage requirement in Alternative Set 5 was selected but did not result in a trip covered by an alternative in this Alternative Set having an observer, this Alternative Set would effectively require additional coverage.

8a. No-action

Under the no-action alternative, there would be no area-based restrictions on the mackerel and/or longfin squid fisheries that are designed to reduce catch of RH/S. State management of RH/S would continue (see 5.9.2) for state catches. The New England and Mid-Atlantic Fishery Management Council's would continue to consider ways to reduce RH/S catch in their at-sea fisheries (and may implement other conservation measures in this amendment or Amendment 5 to the Atl Herring FMP) but there would be no area-based restrictions on the mackerel and/or longfin squid fisheries that are designed to reduce catch of RH/S. There are other area-based closures for bottom trawling already in effect (e.g. black and yellow dashed areas on figures 18-20) related to catch of other fish, habitat, or other issues and these restrictions would remain in effect. Details and charts for existing area-based restrictions may be found at: http://www.nero.noaa.gov/nero/fishermen/charts.html. Some alternatives in the set would require additional observer coverage but under the no-action alternative the current observer coverage levels would continue (see 5.5.2 and 5.5.3).

8b. Make implementing area-based "hotspot closures" to reduce catches (similar to those considered in NEFMC's Amendment 5 to the Atlantic Herring Plan) frameworkable. (PREFERRED)

The wording of this alternative has been modified from the DEIS to clarify the Council's intent but the substance of the alternative has not changed.

The Council chose No Action regarding the hotspot measures but via 8b the Council would make the hotspot requirements considered below frameworkable under a subsequent action. A framework would have to be initiated to consider hotspot measures in the future and additional analysis will be competed if and when additional frameworks are initiated.

8cMack. For Atlantic mackerel permitted vessels, more than an incidental level of fish (20,000 pounds mackerel) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

8cMack would prohibit directed mackerel fishing in a River Herring Monitoring/Avoidance Area without a NMFS-approved and possibly industry funded (if necessary) observer at any point during the trip. See alternative 5f for funding/operational details.

8cLong. For longfin squid permitted vessels, more than an incidental level of fish (2,500 pounds longfin squid) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

8cLong would prohibit directed longfin squid fishing in a River Herring Monitoring/Avoidance Area without a NMFS-approved and possibly industry funded (if necessary) observer at any point during the trip. See alternative 5f for funding/operational details.

8dMack. If a mackerel-permitted vessel is fishing in any River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 non-target catch 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.

8dLong. If a longfin squid-permitted vessel is fishing in a River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 non-target catch 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.

8eMack. Vessels possessing a federal mackerel permit would not be able to retain, possess or transfer more than an incidental level of fish (20,000 pounds mackerel) while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel.

8eMack would prohibit directed mackerel fishing in a River Herring Protection Area unless no mesh smaller than 5.5 inches was onboard the vessel. 5.5 inches was chosen because based on the analysis in this document (see Appendix 2), substantial catch of RH/S appears unlikely at mesh sizes of 5.5 inches or greater.

8eLong. Vessels possessing a federal moratorium longfin squid permit would not be able to retain, possess or transfer 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.

8eLong would prohibit directed longfin squid fishing in a River Herring Protection Area unless no mesh smaller than 5.5 inches was onboard the vessel. 5.5 inches was chosen because based on the analysis in this document (see Appendix 2), substantial catch of RH/S appears unlikely at mesh sizes of 5.5 inches or greater.

8f. Make the above measures 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong only effective if/when they are effective for Atlantic Herring vessels, including if they become effective in the middle of a season because a catch-cap based trigger is reached by the Atlantic Herring fleet under a trigger established by Amendment 5 to the Atlantic Herring FMP.

These same measures are being considered in Amendment 5 to the Atlantic Herring fishery management plan for the Atlantic herring fishery. Given the overlap in the Atlantic mackerel and Atlantic herring fisheries, and given the hotspots in this Alternative Set are focused on RH catch on herring trips, it primarily makes sense for the hotspot provisions to apply if they also apply to Atlantic herring fishing. 8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen.

6.0 Description of the Affected Environment

This section identifies and describes the *valued ecosystem components* (VECs) (Beanlands and Duinker 1984) likely to be affected by the actions proposed in this document. The VECs comprise the affected environment within which the proposed actions will take place. The VECs are identified and described here as a means of establishing a baseline for the impact analysis that will be presented in section 7's "Analysis of Impacts." The significance of the various impacts of the proposed actions on the VECs will also be assessed from a cumulative effects perspective. The range of VECs is described in this section is limited to those for which a reasonable likelihood of meaningful impacts could potentially be expected (CEQ 1997). These VECs are listed below.

1. Managed resources (Atlantic mackerel, longfin squid and *Illex* squid and butterfish)
2. Non-target species (a NEPA-inspired term that includes both discards and incidental catch under MSA)
3. Habitat including EFH for the managed resources and non-target species
4. Endangered and other protected resources
5. Human communities

The physical environment is described next, to establish the context for the VECs, and will be followed by the description of the actual VECs. Appendix D of the 2012 Specifications Environmental Assessment (http://www.mafmc.org/fmp/msb_files/msbSpecs2012.htm) also contains a variety of ecosystem factors considered by the Council.

6.1 Physical Environment

Climate, physiographic, and hydrographic differences separate the Atlantic ocean from Maine to Florida into two distinct areas, the New England-Middle Atlantic Area and the South Atlantic Area, with the natural division occurring at Cape Hatteras, though the division is probably better thought of as a mixing zone rather than as a definitive boundary. The MSB fisheries are prosecuted in the New England-Middle Atlantic Area. The New England-Middle Atlantic area is fairly uniform physically and is influenced by many large coastal rivers and estuarine areas (Freeman and Walford 1974 a-d, 1976 a and b). In the New England-Middle Atlantic area, the continental shelf (characterized by water less than 650 ft in depth) extends seaward approximately 120 miles off Cape Cod, narrows gradually to 70 miles off New Jersey, and is 20 miles wide at Cape Hatteras. Surface circulation is generally southwesterly on the continental shelf during all seasons of the year, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Water temperatures range from less than 33 ^{o}F in the New York Bight in February to over 80 ^{o}F off Cape Hatteras in August.

Within the New England-Middle Atlantic Area, the principal area within which the MSB fisheries are prosecuted is the Northeast Shelf Ecosystem which includes the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Figure 27). A number of distinct subsystems comprise the region. The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and fast-moving currents. The Mid-Atlantic Bight

is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC.

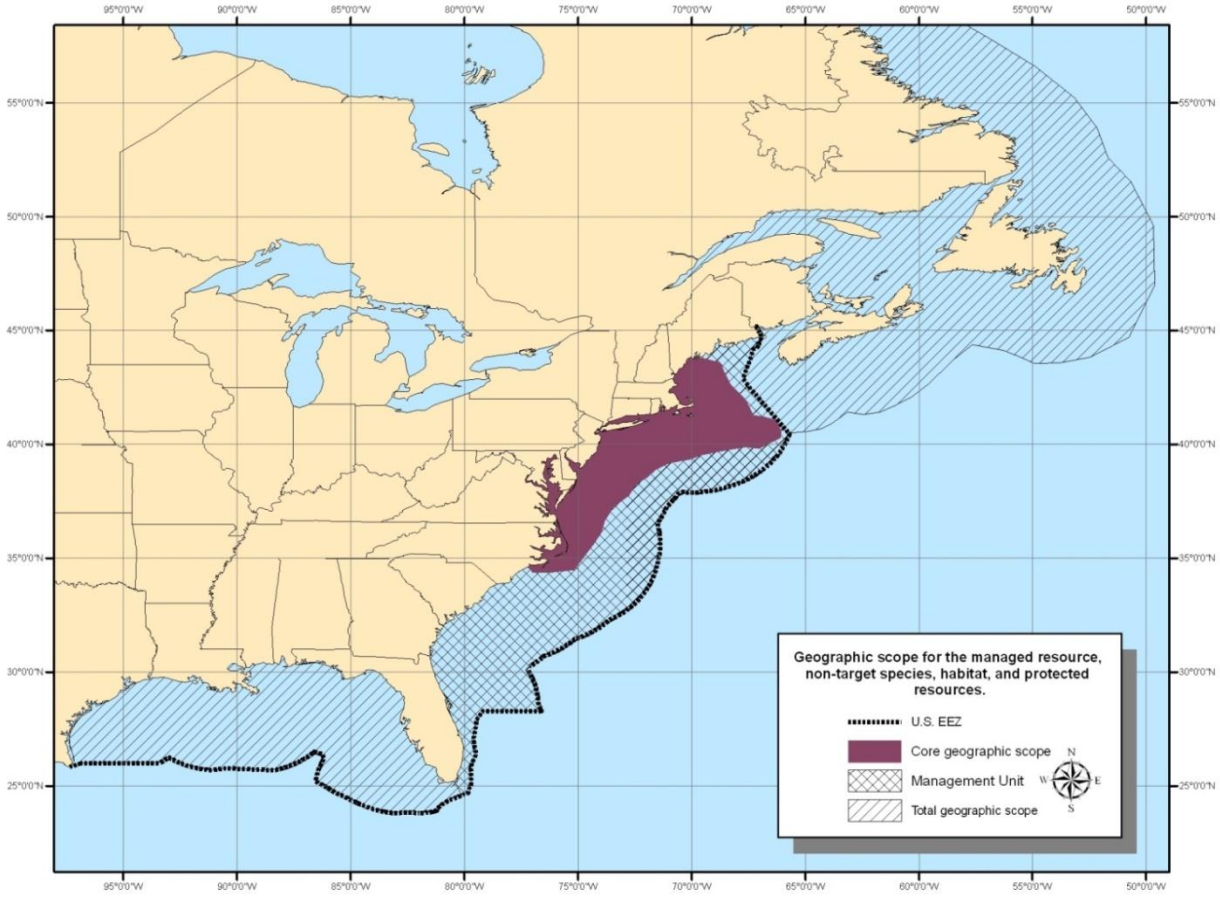


Figure 27. Geographic scope of the mackerel, squid and butterfish fisheries.

Figures 1 describes the geographic scope of the MSB fisheries. Almost all of the MSB catch and related effort occurs within the solid shaded "core geographic scope." Previous public comment has requested that the Council include mention that numerous old dump sites for municipal, industrial, and military waste exist in the management area, specifically the "106-Mile Dump Site" formerly utilized east of Delaware's ocean coastline, beyond the Continental Shelf. Detailed information on the 106-Mile Dump Site can be found in the 1995 EPA report to Congress on the 106-Mile Dump Site available by searching for "106 Mile Dump Site at http://www.epa.gov/history/. The available research generally concluded that sewage sludge did not reach important areas for commercial fisheries and that the 106-Mile Dump Site was not the prime source of the generally low chemical contamination in tilefish, the primary commercially important finfish species resident in the shelf/slope areas adjacent to the 106-Mile Dump Site (EPA 1995).

6.2 Biology of the Managed Resources

6.2.1 Atlantic mackerel (mackerel)

Atlantic mackerel is a pelagic, schooling species distributed between Labrador (Newfoundland, Canada) (Parsons 1970) and North Carolina (Anderson 1976a). Sette (1943; 1950) identified two distinct groups consisting of a northern contingent and a southern contingent. The two contingents overwinter primarily along the continental shelf between the Middle Atlantic and Nova Scotia, although it has been suggested that overwintering occurs as far north as Newfoundland. With the advent of warming shelf water in the spring, the two contingents begin migration, with the northern contingent moving along the coast of Newfoundland and historically into the Gulf of St. Lawrence for spawning from the end of May to Mid-August (Berrien 1982). The southern contingent spawns in the Mid-Atlantic and Gulf of Maine from mid-April to June (Berrien 1982) then moves north to the Gulf of Maine and Nova Scotia. In late fall, migration turns south and fish return to the over-wintering grounds. *Some of the Council's advisers who mackerel fish have questioned if the historical patterns described above are being maintained currently.* Biochemical studies (Mackay 1967) have not established that genetic differences exist between the two groups and precise estimates of the relative contributions of the two groups cannot be made (ICNAF 1975). Atlantic mackerel in the northwest Atlantic are assessed as a unit stock and are considered one stock for fishery management purposes.

Mackerel are 0.1" long at hatching, grow to about 2" in two months, and reach a length of 8" in December, near the end of their first year of growth (Anderson and Paciorkowski 1978). During their second year of growth they reach about 10" in December, and by the end of their fifth year they grow to an average length of 13" FL. Fish that are 10-13 years old reach a length of 15-16" (Grosslein and Azarovitz 1982). MacKay (1973) and Dery and Anderson (1983) have found an inverse relationship between growth and year class size. All Atlantic mackerel are sexually mature by age 3, while about 50% of the age 2 fish are mature. Average size at maturity is about 10.5-11" FL (Grosslein and Azarovitz 1982). The maximum age observed is 17 years (Pentilla and Anderson 1976).

Atlantic mackerel are opportunistic feeders that can ingest prey either by individual selection of organisms or by passive filter feeding (Pepin *et al.* 1988). Larvae feed primarily on zooplankton. Juveniles eat mostly small crustaceans such as copepods, amphipods, mysid shrimp and decapod larvae. They also feed on small pelagic molluscs (*Spiratella* and *Clione*) when available. Adults feed on the same food as juveniles but diets also include a wider assortment of organisms and larger prey items. For example, euphausiid, pandalid and crangonid shrimp are common prey; chaetognaths, larvaceans, pelagic polychaetes and larvae of many marine species have been identified in mackerel stomachs. Immature mackerel begin feeding in the spring; older fish feed until gonadal development begins, stop feeding until spent and then resume prey consumption (Berrien 1982).

Atlantic mackerel are an important prey species and are known to be preyed upon by many pelagic and demersal fish species, as well as by marine mammals and seabirds (Smith and Gaskin 1974; Payne and Selzer 1983; Overholtz and Waring 1991; Montevecchi and Myers 1995; Scott and Tibbo 1968; Maurer and Bowman 1975; Stillwell and Kohler 1982, 1985; Bowman and Michaels 1984). The recent TRAC estimated mortality for a subset of key finfish predators (www.mar.dfo-mpo.gc.ca/science/trac/tsr.html) but estimates for marine mammals and seabirds are not available.

Stock Status

The mackerel stock was most recently assessed via a Transboundary Resource Assessment Committee in 2010 (TRAC 2010), which analyzed data though 2008 (www.mar.dfo-mpo.gc.ca/science/trac/tsr.html). A number of different models and model formulations were evaluated. Given the uncertainty in the assessment results, the TRAC agreed that short term projections and characterization of stock status relative to estimated reference points would not be an appropriate basis for management advice at this time. 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 (80,000 mt) over the last three years (2006-2008) until such time that new information suggests that a different amount is appropriate. Spawning Stock Biomass outputs from the final TRAC model are included below in Figure 28 but were considered useful only for the purposes of indicating likely trends.

While NMFS' official "status of stocks" document technically list mackerel as "not overfished" and "not experiencing overfishing" the results of the 2010 TRAC suggest their true status is unknown with respect to being overfished or not and with respect to experiencing overfishing or not, especially since the 2010 TRAC identified technical issues with the preceding assessment. Efforts are ongoing to determine if a switch to "unknown status" would be more appropriate.

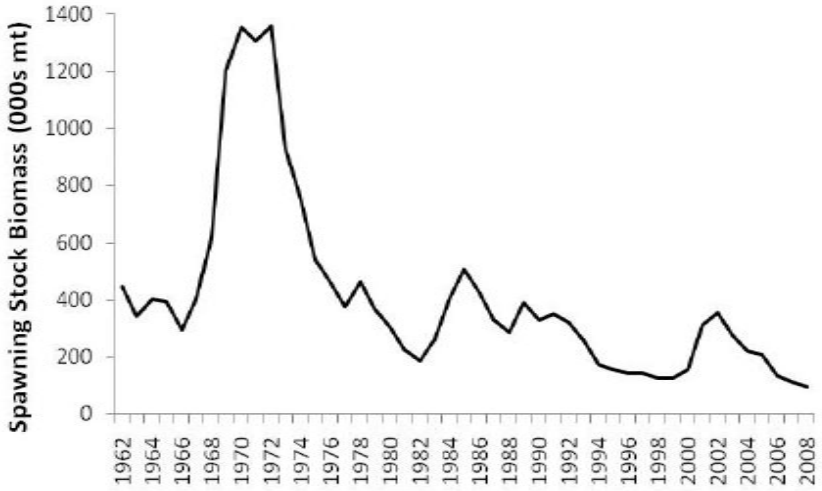


Figure 28. 2010 Mackerel TRAC Spawning Stock Biomass final model output.

NEFSC Spring Survey indices (Geometric Mean) through 2011 (a special request was made for Spring 2011 mackerel data due to concerns about low 2011 catch) for mackerel are included below. Taking the Geometric mean of a given year's values for individual hauls dampens the impact of individual large hauls and was the way the survey data was used in the 2010 TRAC assessment. It is important to note that the 2009-2011 values are adjusted from the raw data of the new Bigelow survey ship based on the calibration study between the Bigelow and its predecessor the Albatross. The calibration factor for this species is one factor for all sizes, and the next assessment may investigate whether size-specific calibration factors are more appropriate. Additional calibration information may be found at: http://www.nefsc.noaa.gov/publications/crd/crd1005/index.html (Miller et al 2010).

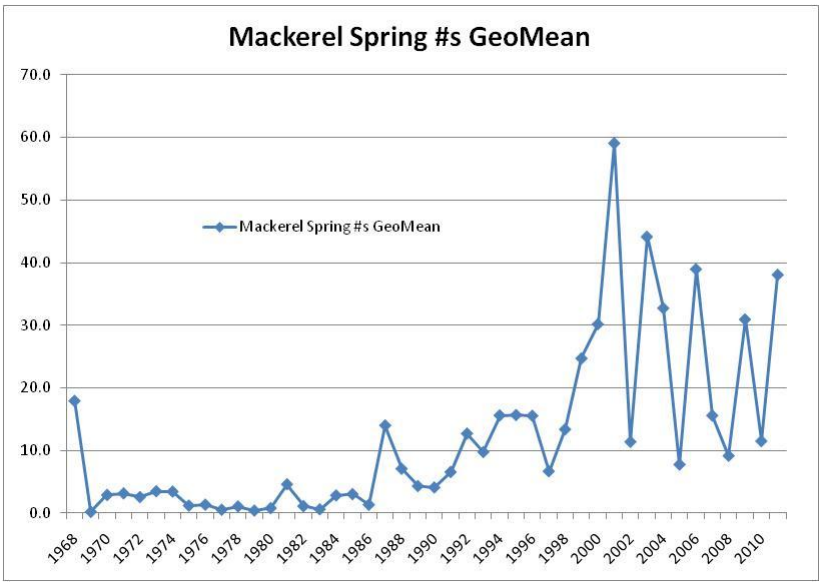


Figure 29. Spring NEFSC Survey Mackerel Indices 1968-2011. Geometric Mean, Numbers per Tow

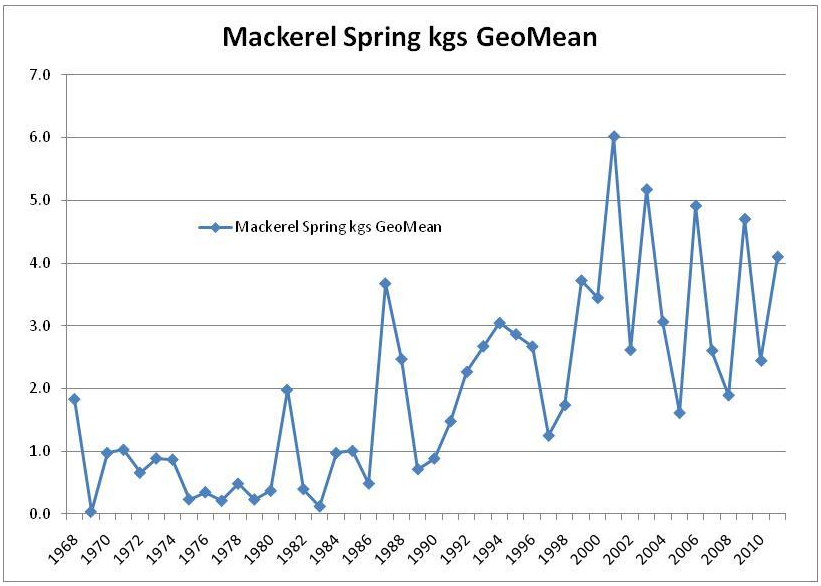


Figure 30. Spring Survey Mackerel Indices 1968-2011. Geometric Mean, kg per Tow

6.2.2 *Illex illecebrosus*

Illex is not a primary concern of this Amendment so only stock status information is provided for reference. Additional details may be found in the specifications environmental assessment which can be downloaded here: http://www.mafmc.org/fmp/msb_files/msbSpecs2012.htm.

Stock Status

The *Illex* stock was most recently assessed at SARC 42 (2006). SARC 42 was publically available in 2006 and included data through 2004. It was not possible to evaluate current stock status because there are no reliable current estimates of stock biomass or fishing mortality rate. The short lifespan of *Illex* greatly complicates assessing the stock with the available survey and assessment resources. In-season assessment and management would be the optimal way to manage any short-lived squid fishery but sufficient resources are not currently available.
NEFSC indices for fall surveys (when *Illex* are available) are included below. It is important to note that the 2009 and 2010 values are adjusted from the raw data of the new Bigelow survey ship based on the calibration study between the Bigelow and its predecessor the Albatross. The calibration factor for this species is one factor for all sizes, and the next assessment may investigate whether size-specific calibration factors are more appropriate.

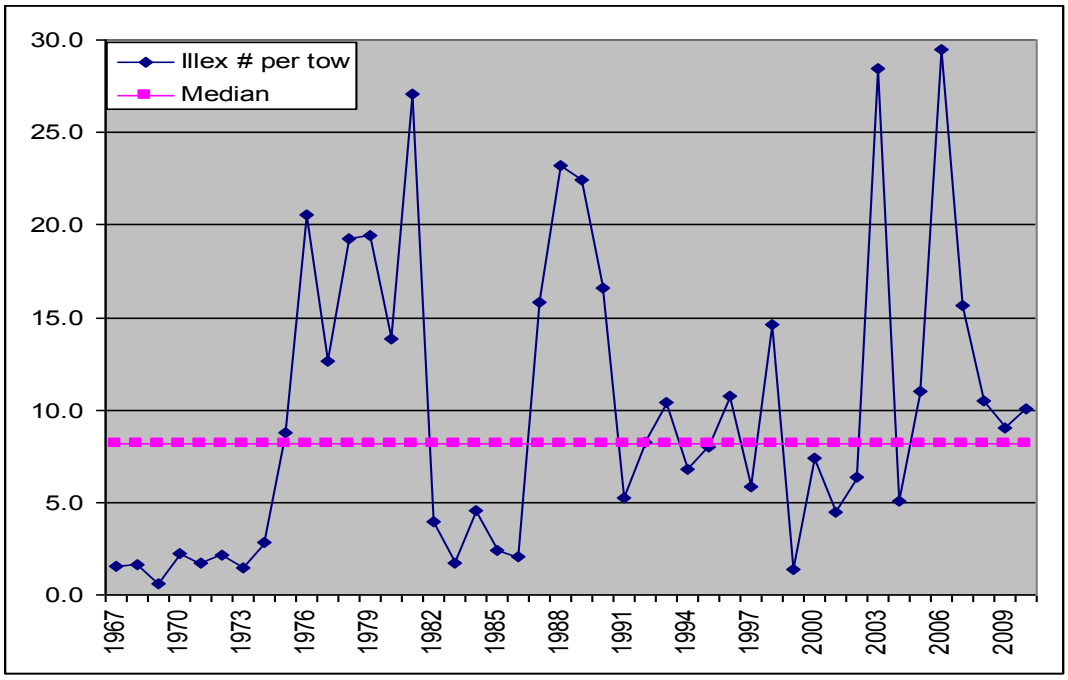


Figure 31. Fall NEFSC Trawl Survey - *Illex* Mean #/tow.

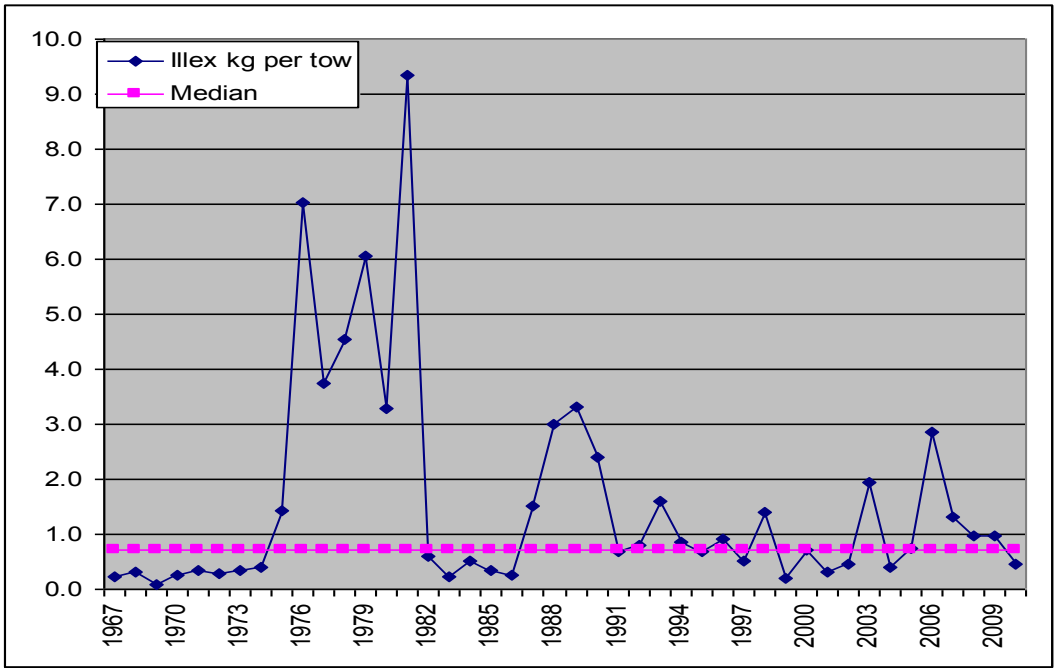


Figure 32. Fall NEFSC Trawl Survey - *Illex* Mean kg/tow.

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6.2.3 Butterfish

Butterfish is not a primary concern of this Amendment so only stock status information is provided for reference. Additional details may be found in the specifications environmental assessment which can be downloaded here: http://www.mafmc.org/fmp/msb_files/msbSpecs2012.htm.

Stock Status

The butterfish stock was most recently assessed at SARC 49 (2010) using data through 2008. The SARC review panel did not accept the adequacy of the redefined Biological reference points or the Biological reference points used for stock status determination in the 2004 butterfish assessment. The review panel questioned the application of MSY theory to a short-lived recruitment-dominated population, particularly the use of equilibrium methods when trends in the data suggest the stock is declining even with low fishing mortality. It was agreed that overfishing was not likely occurring. The review panel concluded that the decline in the butterfish stock appears to be driven by environmental processes and low recruitment. Determination of an overfished versus not overfished condition was not resolved at the meeting, which left the overfished status of butterfish unknown. Final model outputs for biomass, recruitment, and fishing mortality were only accepted in terms of reflecting the appropriate trend (downward).

While NMFS' official "status of stocks" document technically lists butterfish as "overfished" and "not experiencing overfishing" the results of the 2010 assessment suggest their true status is unknown with respect to being overfished or not and unknown with respect to experiencing overfishing or not because of butterfish's short lifespan and because of the concerns raised by the review panel regarding the 2004 assessment's conclusions. Efforts are ongoing to determine if a switch to "unknown status" would be more appropriate.

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6.2.4 Longfin Squid

Longfin squid are distributed primarily in continental shelf waters located between Newfoundland and the Gulf of Venezuela (Cohen 1976; Dawe et al. 1990). In the northwest Atlantic Ocean, longfin squid are most abundant in the waters between Georges Bank and Cape Hatteras, NC where the species is commercially exploited. The stock area extends from the Gulf of Maine to southern Florida. However, the southern limit of the species' distribution in U.S. waters is unknown due to an overlap in geographic distribution with the congener, *Loligo pleii*, which cannot be visually distinguished from longfin squid using gross morphology (Cohen 1976). A recent genetics study indicates that the population inhabiting the waters between Cape Cod Bay, MA and Cape Hatteras, NC is likely a single stock (Shaw et al. 2010). Distribution varies seasonally. North of Cape Hatteras, squid migrate offshore during late autumn to overwinter in warmer waters along the shelf edge and slope, and then return inshore during the spring where they remain until late autumn (Jacobson 2005).

Natural mortality rates are very high, especially after spawning. The species is migrates long distances during its short lifespan; inshore during spring and offshore during late fall. Recruitment occurs throughout the year with seasonal peaks in overlapping "micro-cohorts" which have rapid and different growth rates (Brodziak and Macy 1996; Macy and Brodziak 2001). As a result, seasonally stable biomass estimates may mask substantial population turnover (Guerra et al. 2010). Recruitment of longfin squid is largely driven by environmental factors (Dawe et al. 2007). For most squid species, temperature plays a large role in migrations and distribution, growth, and spawning (Boyle and Rodhouse 2005). For longfin squid, individuals hatched in warmer waters during the summer grow more rapidly than those hatched in winter and males grow faster and attain larger sizes than females (Brodziak and Macy 1996).

Statolith ageing studies of longfin squid have indicated a life span of less than one year (Macy 1992, Brodziak and Macy 1996). Consequently, all recent stock assessments for longfin squid have been conducted under the assumption that the species has a semelparous (i.e., annual) life-cycle and has the capacity to spawn throughout the year (NMFS 1994), as now appears typical of pelagic squid species studied throughout the world (Jereb *et a*l. 1991).

Longfin squid eggs are usually attached to a preexisting cluster of newly spawned eggs (clusters are initiated on rocks, sand, and seaweeds). The female lays between 20 and 30 of these capsules, each containing 150 to 200 large (about 0.05"), oval eggs, for a total of 3,000 to 6,000 eggs. These clusters of demersal eggs, with as many as 175 capsules per cluster, are found in shallow waters (10-100') and may often be found washed ashore on beaches (Jacobson 2005, Grosslein and Azarovitz 1982).

The diet of longfin squid changes with increasing size; small immature individuals feed on small invertebrates and planktonic organisms (Vovk 1972a, Tibbetts 1977) while larger individuals feed on crustaceans and small fish (Vinogradov and Noskov 1979). Cannibalism is observed in individuals larger than 2 in (5 cm) (Whitacker 1978). Maurer and Bowman (1985) demonstrated seasonal and inshore/offshore differences in diet: in the spring in offshore waters, the diet was composed of crustaceans (mainly euphausiids) and fish; in the fall in inshore waters, the diet was composed almost exclusively of fish; and in the fall in offshore waters, the diet was composed of fish and squid.

Longfin squid are an important prey species and are known to be preyed upon by many pelagic and demersal fish species, as well as by marine mammals, seabirds, and *Illex* squid (Lange and Sissenwine 1980, Vovk and Khvichiya 1980, Summers 1983, Waring *et al.* 1990, Overholtz and Waring 1991, Gannon *et al.* 1997, Maurer 1975, Langton and Bowman 1977, Gosner 1978, Lange 1980, Vinogradov 1984).

Stock Status

Based on a new proposed biomass reference point from the 2010 assessment (NEFSC 2011), the longfin inshore squid stock was not overfished in 2009, but overfishing status was not determined because no overfishing threshold was recommended. The 2010 longfin squid assessment (NEFSC 2010) essentially found that the longfin squid stock appears to have successfully supported the range of observed catches (9,600 mt - 26,100 mt) during 1976-2009, as well as relatively high levels of finfish predation during 1977-1984 and 1999-2009. Finfish predation appeared relatively low 1978-1998. Catch divided by biomass was used to evaluate exploitation and the highest exploitation index occurred related to a catch of 23,400mt which was the basis for this year's ABC. This was an important finding for management purposes given all of the squid in a squid as0sessment are dead before the assessment is completed, never-mind when management might actually seek to use the results. In-season assessment and management would be the optimal way to manage any short-lived squid fishery but sufficient resources are not currently available.

A new target Biomass Associated with MSY of 50% of K (0.50*(76,329/0.90) = 42,405 mt) was recommended. The biomass threshold is 50% of the Biomass Associated with MSY (= 21,203 mt). The biomass estimate, which is based on the two-year average of catchability-adjusted spring and fall survey biomass during 2008-2009, was 54,442 mt (80% Confidence Interval = 38,452-71,783 mt). This is greater than the Biomass Threshold and the target Biomass Associated with MSY. The stock exhibits very large fluctuations in abundance from variation in reproductive success and recruitment, expressed as large inter-annual changes (2-3 fold) in survey biomass.

A new threshold reference point for fishing mortality was not recommended in the 2010 assessment because there was no clear statistical relationship between longfin squid catch and annual biomass estimates during 1975-2009. Furthermore, annual catches were low relative to annual estimates of minimum consumption by a subset of fish predators. The 2009 exploitation index of 0.176 (catch divided by the average 2008-2009 spring and fall survey biomasses) was slightly below the 1987-2008 median of 0.237 (80% Confidence Interval = 0.124-0.232). Relevant NEFSC trawl indices are provided in figure 38 though figure 43. 2009 and 2010 values have been calibrated "back" to Albatross units to facilitate comparison with a length-specific calibration factor developed in the recent assessment.

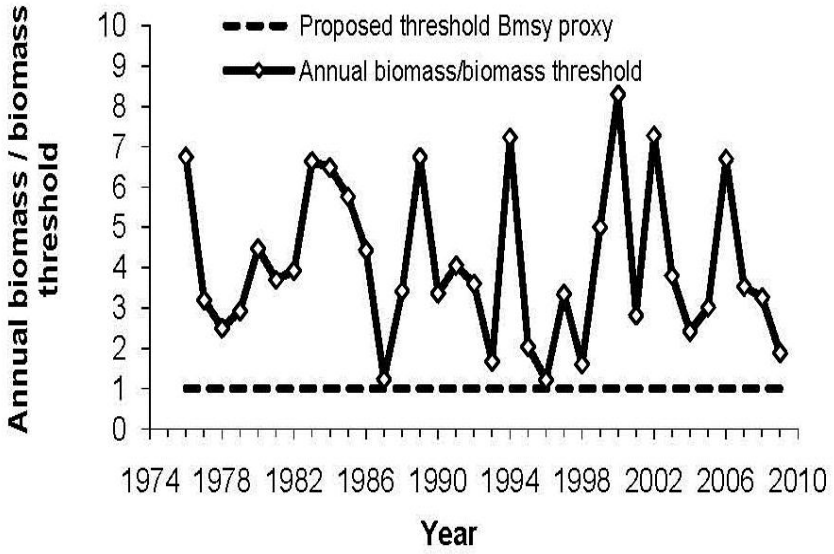

Figure 33. 2010 Assessment Figure B6 - Annual Biomass in Relation to the Proposed Biomass Threshold (which is ½ of the target) - Shown Here as a Relative Value

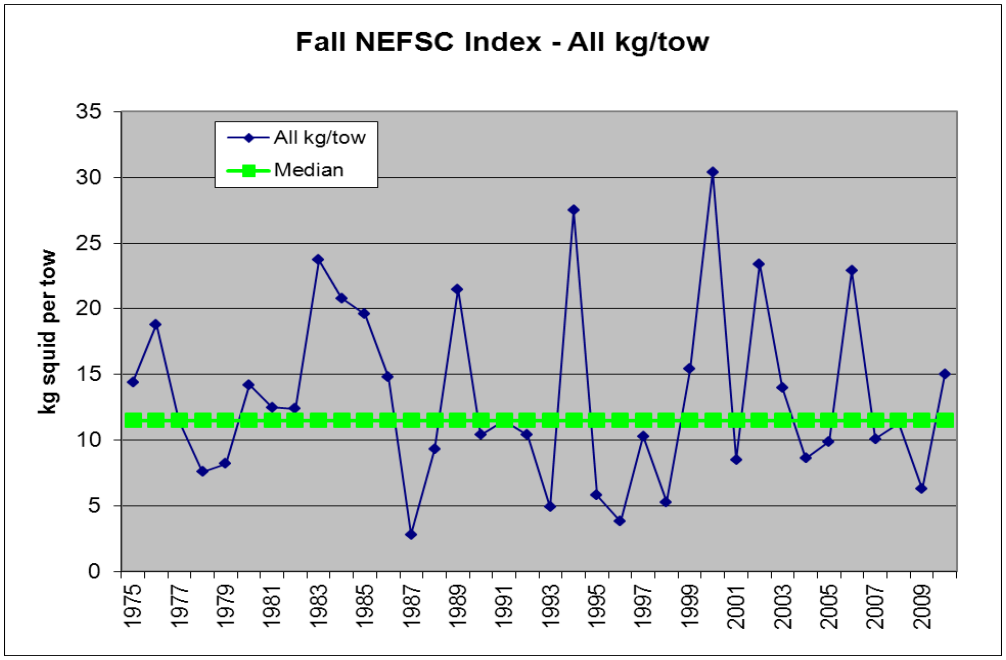

Figure 34. Fall NEFSC Trawl Survey – Longfin Squid Mean kg/tow All Sizes.

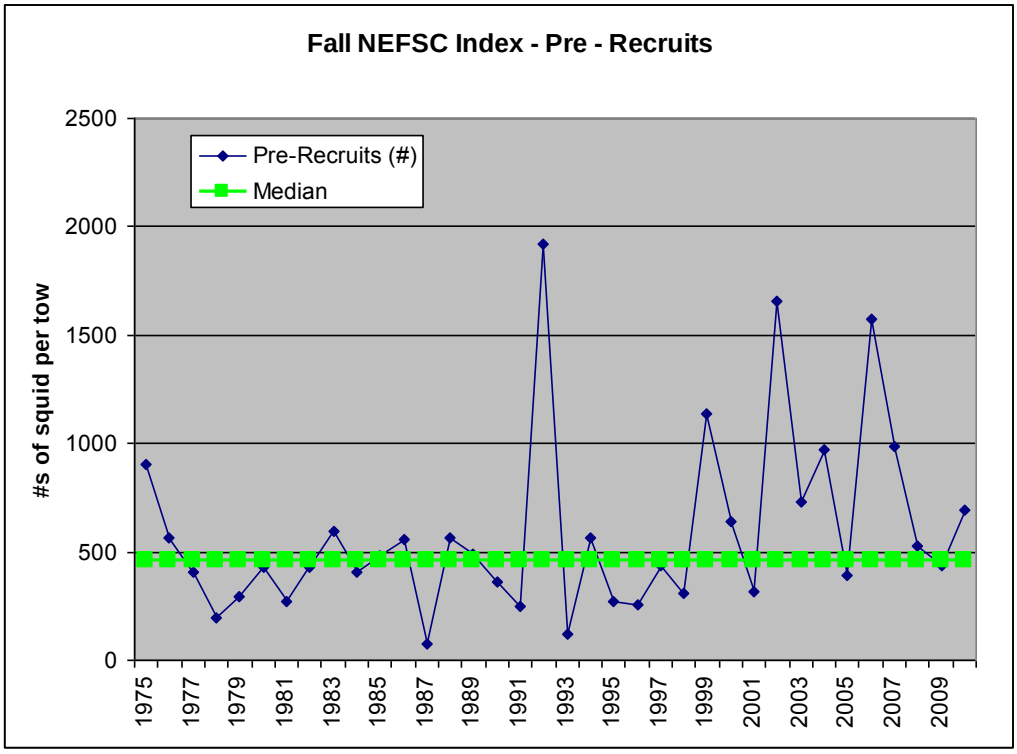

Figure 35. Fall NEFSC Trawl Survey – Longfin Squid Mean #/tow Pre-recruits.

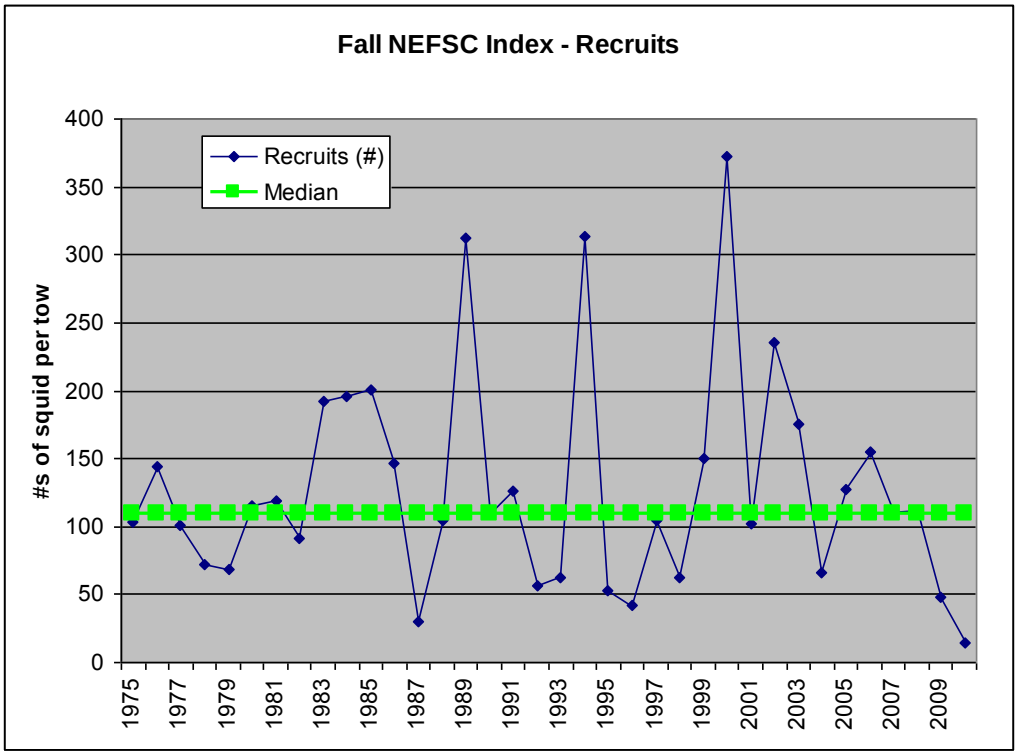

Figure 36. Fall NEFSC Trawl Survey – Longfin Squid Mean #/tow Recruits.

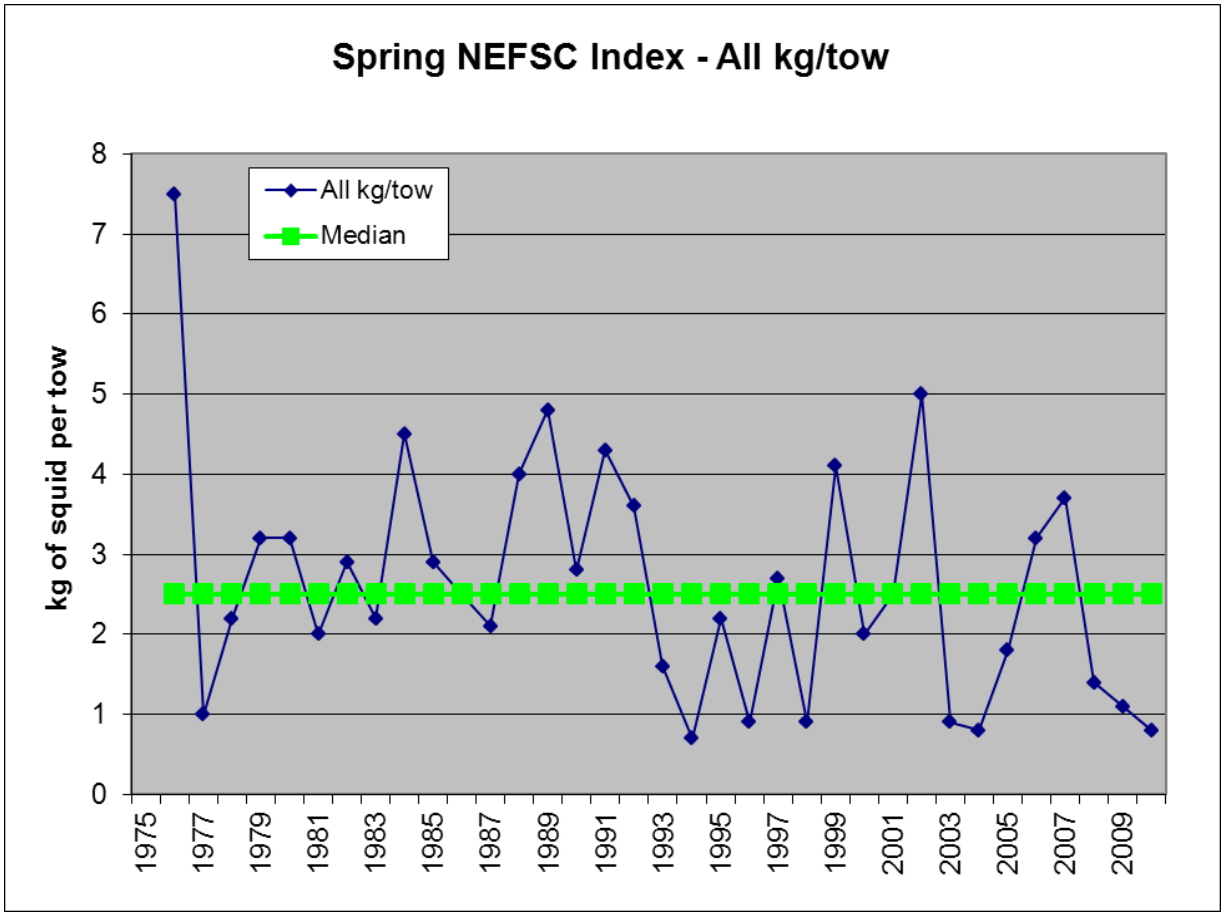

Figure 37. Spring NEFSC Trawl Survey – Longfin Squid Mean kg/tow All Sizes.

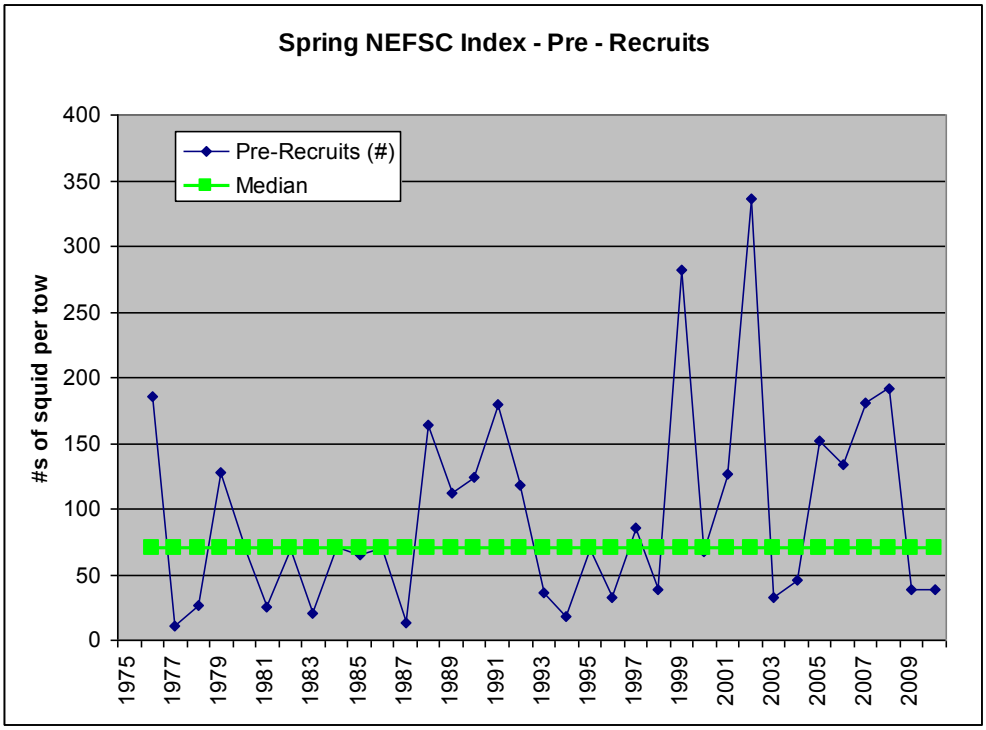

Figure 38. Spring NEFSC Trawl Survey – Longfin Squid Mean #/tow Pre-recruits.

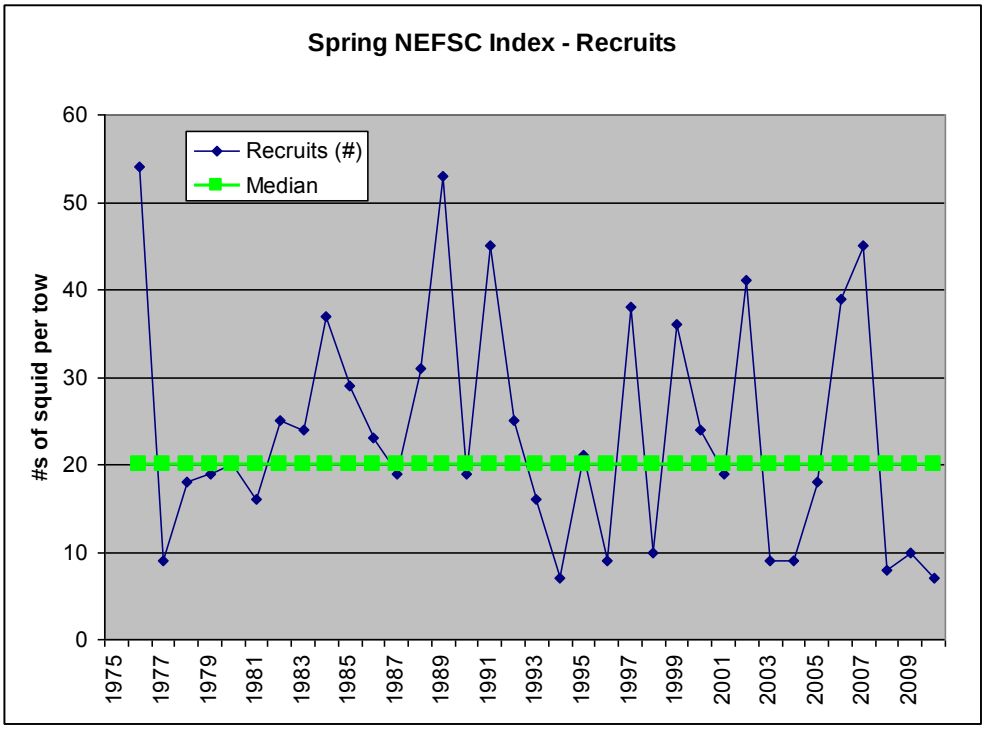

Figure 39. Spring NEFSC Trawl Survey – Longfin Squid mean #/tow Recruits.

6.2.5 Atlantic Herring

Given the mixed nature of the MSB fleets and their co-catch of Atlantic Herring as described elsewhere in this document (see Appendix 2), a brief summary of the status of the Atlantic Herring resource and fishery is provided below. This summary is adapted from the Atlantic Herring Fishery Management Plan's Amendment 5 DEIS, which is available in its entirety at: http://www.nefmc.org/herring/index.html.

The NEFMC manages herring under the Atlantic Herring FMP. 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. 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.

During at least some part of the year, Atlantic herring are 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 – 9 degrees C (Munro 2002; Zinkevich 1967), but may overwinter at temperatures as low as 0o C (Reid et al. 1999).

Stock Status

Currently, the stock complex is not overfished and overfishing is 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 a dishing mortality associated with MSY = 0.27 and the Biomass Associated with 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 the Biomass Associated with MSY (670,600 mt). Fishing mortality has remained relatively low since the early 1990s and averaged 0.17 during 1998-2008, which is below the fishing mortality associated with MSY (0.27).

6.3 Non-Target Species (Fish)

6.3.1 Past Analyses

Discarding has been addressed generally in a number of previous actions, most recently Amendment 10 to the MSB FMP. Discarding across the MSB fisheries is described in the annual specifications from a "directed trip" point of view. The trip definitions used are described below (there is no identifiable directed butterfish fishery):

Mackerel: Directed mackerel trips are defined as all trips that had at least 50% mackerel by weight and all trips over 100,000 pounds of mackerel regardless of the ratio of other species. This definition results in capturing 97.4% of all mackerel landings in the dealer weighout database 2006-2010. The other trips with lower mackerel landings landed a variety of species, mostly Atlantic herring, silver hake, longfin squid, and scup. The set of trips in the observer database with the same mackerel criteria included 12 on average for each year 2006- 2010 (61 total with 73 at least partially unobserved hauls and 204 observed hauls). The observed mackerel caught on these trips accounted for approximately 6.5% of the total mackerel caught.

Illex: Directed *Illex* trips are defined All trips that had at least 50% *Illex* by weight. This definition results in capturing 99.6% of all *Illex* landings in the dealer weighout database 2006-2010 and was applied to the observer database to examine discards in the *Illex* fishery. The resulting set of trips in the observer database included 18 on average for each year 2006-2010 (91 total – 2010 had a relatively high number of observed trips). These 91 trips made 962 hauls of which 94% were fully observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc. Readers will note the high FISH, NK numbers in the associated table. This was caused by one haul in 2009 that was too big to bring aboard a vessel and some had to be dumped (installed net sensors failed). While it had to be recorded as FISH, NK, the observer's log suggests that it was mostly squid ("Unknown as to how much was released, but observer saw a swordfish come out along with the squid."). Also, of the 75,042 pounds that did come aboard from this haul, the observer recorded only 42 pounds of *Illex* discarded and no other species observed. The observed *Illex* caught on these trips accounted for approximately 11.0 % of the total *Illex* caught.

Longfin Squid: All trips that had at least 50% longfin squid by weight and all trips that had at least 10,000 pounds of longfin squid regardless of the ratio to other species. This definition results in capturing almost 91% of all longfin squid landings in the dealer weighout database. This definition was applied to the observer database to examine discards in the longfin squid fishery. The resulting set of trips in the observer database included 83 on average for each year 2006-2010 (413 total – 2009 and 2010 had relatively high numbers of observed trips). These 413 trips made 4186 hauls of which 91% were fully observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc. The observed longfin squid caught on these trips accounted for approximately 3.5% of the total longfin squid caught.

Using the ratios of caught other species to retained directed species, and average landings of the target species, one can make a rough calculation of the annual catch of the relevant non-target species, described in the tables below.

This document includes a technically superior catch estimation methodology for RH/S described below. However, since the tables generated for the specifications list the major other species caught, they are provided below for reference. Also, the lack of substantial RH/S catch in the *Illex* fishery is a primary reason why this Amendment focused on the mackerel and longfin squid fisheries. This finding was reinforced by the new analysis, as described below.

Table 17. Key Species Observed Taken and Discarded in Directed Trips for Mackerel, Based on Unpublished NMFS Northeast Fisheries Observer Program Data and Unpublished Dealer Weighout Data from 2006-2010. (see text for criteria). There Are 2204.6 Pounds in One Metric Ton.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	For every metric ton of mackerel caught, pounds of given species caught.	For every metric ton of mackerel caught, pounds of given species discarded.	D:K Ratio (Ratio of species discarded to Mackerel Kept)	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	Rough Annual Catch (pounds) based on 5-year (2006-2010) average of mackerel catch (29,200 mt)
Directed Mackerel Trip Bycatch and Discards								
DOGFISH SPINY	153,250	143,036	16.1	15.0	0.0068	47%	93%	468,934
HERRING, ATLANTIC	7,300,067	71,601	765.0	7.5	0.0034	23%	1%	22,337,625
SCUP	41,899	41,848	4.4	4.4	0.0020	14%	100%	128,206
FISH, NK	18,800	18,800	2.0	2.0	0.0009	6%	100%	57,527
MACKEREL, ATLANTIC	21,037,906	18,575	2,204.6	1.9	0.0009	6%	0%	NA
HERRING (NK)	2,859	2,859	0.3	0.3	0.0001	1%	100%	8,748
BUTTERFISH	13,151	2,821	1.4	0.3	0.0001	1%	21%	40,240
BASS, STRIPED	1,605	1,605	0.2	0.2	0.0001	1%	100%	4,911
SQUID (ILLEX)	2,709	1,148	0.3	0.1	0.0001	0%	42%	8,290
HAKE, SILVER	16,433	1,032	1.7	0.1	0.0000	0%	6%	50,284
SHAD, AMERICAN	3,502	702	0.4	0.1	0.0000	0%	20%	10,717
HERRING, BLUE BACK	97,416	644	10.2	0.1	0.0000	0%	1%	298,084
DOGFISH (NK)	500	500	0.1	0.1	0.0000	0%	100%	1,530
SEA BASS, BLACK	638	469	0.1	0.0	0.0000	0%	74%	1,952
SEA ROBIN, NORTHERN	330	312	0.0	0.0	0.0000	0%	95%	1,010
ALEWIFE	22,152	305	2.3	0.0	0.0000	0%	1%	67,783

Table 18. Key Species Observed Taken and Discarded in Directed Trips for *Illex*, Based on Unpublished NMFS Northeast Fisheries Observer Program Data and Unpublished Dealer Weighout Data from 2006-2010. (see text for criteria). There Are 2204.6 Pounds in One Metric Ton.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	For every metric ton of Illex caught, pounds of given species caught.	For every metric ton of Illex caught, pounds of given species discarded.	D:K Ratio (Ratio of species discarded to Illex Kept)	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	Rough Annual Catch (pounds) based on 5-year average of Illex landings (15,314 mt)
Directed Illex Trip Bycatch and Discards								
SQUID (ILLEX)	18,560,449	263,257	2,204.6	31	0.0144	64.1%	1%	NA
BUTTERFISH	51,629	37,497	6.1	4	0.0020	9.1%	73%	93,913
FISH, NK	25,994	25,994	3.1	3	0.0014	6.3%	100%	47,282
HAKE, SPOTTED	14,161	14,010	1.7	2	0.0008	3.4%	99%	25,759
DORY, BUCKLER (JOHN)	15,346	10,986	1.8	1	0.0006	2.7%	72%	27,915
HERRING (NK)	10,852	10,852	1.3	1	0.0006	2.6%	100%	19,739
DOGFISH SPINY	9,343	9,341	1.1	1	0.0005	2.3%	100%	16,994
MACKEREL, CHUB	10,226	8,243	1.2	1	0.0005	2.0%	81%	18,602
SQUID (LOLIGO)	75,449	6,648	9.0	1	0.0004	1.6%	9%	137,241
HAKE, SILVER	3,875	3,848	0.5	0	0.0002	0.9%	99%	7,049
SQUID, NK	3,612	3,612	0.4	0	0.0002	0.9%	100%	6,570
BEARDFISH	3,257	3,242	0.4	0	0.0002	0.8%	100%	5,924
HAKE, RED	2,825	2,825	0.3	0	0.0002	0.7%	100%	5,139
DOGFISH SMOOTH	1,257	1,257	0.1	0	0.0001	0.3%	100%	2,287
FLOUNDER, FOURSPOT	1,150	1,150	0.1	0	0.0001	0.3%	100%	2,092
WHITING, BLACK	1,036	1,036	0.1	0	0.0001	0.3%	100%	1,884
ANGLER	1,131	820	0.1	0	0.0000	0.2%	72%	2,057
SHAD, AMERICAN	779	636	0.1	0	0.0000	0.2%	82%	1,417
HADDOCK	582	582	0.1	0	0.0000	0.1%	100%	1,058
ROSEFISH,BLACK BELLY	504	490	0.1	0	0.0000	0.1%	97%	917
REDFISH	454	454	0.1	0	0.0000	0.1%	100%	826

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Table 19. Key Species Observed Taken and Discarded in Directed Trips for Longfin Squid, Based on Unpublished NMFS Northeast Fisheries Observer Program Data and Unpublished Dealer Weighout Data from 2006-2010. (see text for criteria). There Are 2204.6 Pounds in One Metric Ton.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	For every metric ton of Loligo caught, pounds of given species caught.	For every metric ton of Loligo caught, pounds of given species discarded.	D:K Ratio (Ratio of species discarded to Loligo Kept)	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	Rough Annual Catch (pounds) based on 5-year average of Loligo catch (11634 mt)
Directed Loligo Trip Bycatch and Discards								
BUTTERFISH	524,478	490,523	260.3	243.4	0.11	0.17	0.94	3,027,814
DOGFISH SPINY	327,240	326,342	162.4	161.9	0.07	0.11	1.00	1,889,160
SQUID (ILLEX)	651,634	254,007	323.4	126.0	0.06	0.09	0.39	3,761,885
HAKE, SILVER	310,387	240,680	154.0	119.4	0.06	0.08	0.78	1,791,865
HAKE, SPOTTED	227,516	221,705	112.9	110.0	0.05	0.08	0.97	1,313,452
SCUP	225,359	147,507	111.8	73.2	0.03	0.05	0.65	1,301,001
HAKE, RED	151,091	141,791	75.0	70.4	0.03	0.05	0.94	872,248
SKATE, LITTLE	129,078	128,741	64.1	63.9	0.03	0.04	1.00	745,167
FLOUNDER, FOURSPOT	90,270	90,101	44.8	44.7	0.02	0.03	1.00	521,128
SQUID (LOLIGO)	4,442,800	86,808	2204.6	43.1	0.02	0.03	0.02	NA
MACKEREL, ATLANTIC	301,008	75,364	149.4	37.4	0.02	0.03	0.25	1,737,723
FLOUNDER, SUMMER	99,681	50,938	49.5	25.3	0.01	0.02	0.51	575,461
SCALLOP, SEA	55,802	47,427	27.7	23.5	0.01	0.02	0.85	322,145
DOGFISH SMOOTH	48,695	44,503	24.2	22.1	0.01	0.02	0.91	281,118
SEA WEEDS	37,692	37,692	18.7	18.7	0.01	0.01	1.00	217,594
CRAB, LADY	36,931	36,931	18.3	18.3	0.01	0.01	1.00	213,200
BASS, STRIPED	32,826	31,097	16.3	15.4	0.01	0.01	0.95	189,504
HERRING, ATLANTIC	30,188	30,188	15.0	15.0	0.01	0.01	1.00	174,274
SKATE, BIG	27,459	27,057	13.6	13.4	0.01	0.01	0.99	158,519
SKATE, NK	25,968	25,873	12.9	12.8	0.01	0.01	1.00	149,915
FLOUNDER, WINTER	23,383	23,059	11.6	11.4	0.01	0.01	0.99	134,993
HERRING (NK)	20,892	20,882	10.4	10.4	0.00	0.01	1.00	120,610
ANGLER	44,126	18,540	21.9	9.2	0.00	0.01	0.42	254,740
BLUEFISH	43,050	18,402	21.4	9.1	0.00	0.01	0.43	248,530
DORY, BUCKLER (JOHN)	33,895	14,465	16.8	7.2	0.00	0.01	0.43	195,678
SKATE, BARNDOOR	12,720	12,660	6.3	6.3	0.00	0.00	1.00	73,434
SEA BASS, BLACK	18,185	12,433	9.0	6.2	0.00	0.00	0.68	104,984
HAKE, WHITE	13,360	12,255	6.6	6.1	0.00	0.00	0.92	77,125
LOBSTER	15,560	12,093	7.7	6.0	0.00	0.00	0.78	89,830
FISH, NK	6,076	6,033	3.0	3.0	0.00	0.00	0.99	35,078
TAUTOG	6,047	5,617	3.0	2.8	0.00	0.00	0.93	34,910
SHAD, AMERICAN	5,501	5,431	2.7	2.7	0.00	0.00	0.99	31,758
HADDOCK	3,897	3,883	1.9	1.9	0.00	0.00	1.00	22,495
HERRING, BLUE BACK	2,911	2,911	1.4	1.4	0.00	0.00	1.00	16,806
FLOUNDER, YELLOWTAIL	2,244	1,506	1.1	0.7	0.00	0.00	0.67	12,952
ALEWIFE	2,356	1,276	1.2	0.6	0.00	0.00	0.54	13,600
SHAD, HICKORY	1,007	915	0.5	0.5	0.00	0.00	0.91	5,811

6.3.2 **River Herrings (blueback herring and alewife)**

Life history and stock status are summarized below. Additional details may be found in the ASMFC's 2009 Amendment 2 to the Interstate Fishery Management Plan (IFMP) for Shad and River Herring (River Herring Management) available at http://www.asmfc.org/shadRiverHerring.htm (the text below is adapted from that document).

Alewife and blueback herring (collectively known as river herring) are anadromous fishes, spending most of their lives in ocean waters, migrating to their natal freshwater areas in the spring months to spawn. Alewife are most abundant in the Mid-Atlantic and northeastern states.
Blueback herring are found from Nova Scotia to northern Florida and are most abundant in waters from the Chesapeake Bay south (Scott and Scott 1988). Alewife generally spawn earlier than blueback herring in areas where both species occur. Alewife spawn in rivers, creeks, lakes and ponds, over rocks, detritus, submerged aquatic vegetation and sand. Blueback herring generally prefer to spawn over sand or gravel in swift-flowing areas of rivers and tributaries. In more southerly areas where both species exist, blueback herring utilize flooded back swamps, oxbows and stream edges for spawning. For both species, adults return to the ocean after spawning. Juveniles use the rivers and estuaries as nursery areas and migrate to the ocean as water temperatures decline in the fall. River herring reach sexual maturity at 3-6 years of age. Post-spawning mortality is highest in the states south of North Carolina as most populations are considered to be semelparous (i.e., spawn once and die). Little information is available on the life history of river herring once the juveniles emigrate to the ocean and until they return as mature adults to the freshwater areas to spawn, though Appendix 1 describes the distribution of river herring catch in the Northeast Fisheries Science Center (NEFSC) bottom trawl survey data, which takes place in ocean waters. Migration patterns are charted in tables 17 and 18.

Stock Status

In the most recent ASMFC river herring stock assessment, of the 24 river herring stocks for which sufficient data is available to make a conclusion, 23 were depleted relative to historic levels and one was increasing. The status of 28 additional stocks could not be determined because the time-series of available data was too short. Estimates of abundance and fishing mortality could not be developed because of the lack of adequate data. The "depleted" determination was used instead of "overfished" and "overfishing" because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and non-target fishing, but likely also habitat issues (including dam passage), predation, and climate change. It is hard to decipher which factors may be driving river herring abundance trends but the assessment concluded that management actions to reduce total mortality are needed. There are no coast-wide reference points. However, recent Northeast Fisheries Science Center (NEFSC) bottom trawl survey data do suggest possible recent improvement from a coast-wide perspective for both species (see Appendix 1). Both blueback herring and alewife are currently candidate species for ESA listing, with a decision due by NMFS on August 5, 2012 (see Section 6.5.6).

Table 20. Blueback Herring Migration Patterns (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	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	SA											
	spawning									PA	PA	SA													
	incubation									SA	PA	PA	SA												
	juvenile freshwater residence										SA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA				
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration							SA	SA	SA	PA	PA	SA	SA											
	adult emigration									SA	PA	PA	PA	SA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	SA	PA	PA	SA											
	juvenile freshwater residence									SA	PA	PA	PA	PA	PA	PA	SA	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								PA	PA															
	spawning																								
	incubation																								
	juvenile freshwater residence																								
	juvenile emigration																								
Connecticut	adult immigration							SA	SA	PA	PA	SA	SA												
	adult emmigration									SA	PA	SA	PA	PA	SA										
	spawning									SA	PA	PA	SA												
	incubation									SA	PA	SA	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	SA	SA	SA	SA	SA				
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA				

Source: ASMFC

Table 21. Alewife Migration Patterns (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				
	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	PA	SA	SA	SA	SA
New Hampshire	adult immigration								SA	PA	PA	SA	SA												
	adult emmigration									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	SA	SA	SA	SA				
	juvenile emigration														SA	SA	SA	SA	SA	SA	SA				
Massachusetts	adult immigration					SA	SA	PA	PA	SA	PA	PA	SA												
	adult emigration								SA	PA	SA	SA	PA	SA											
	spawning						SA	SA	PA	SA	PA	SA	SA	SA											
	incubation							SA	PA	PA	PA	SA	SA	SA											
	juvenile freshwater residence							SA	SA	PA	PA	PA	PA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA		
	juvenile emigration												SA	PA	PA	SA	SA	PA	PA	PA	PA	SA	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	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	PA	SA	SA	SA	SA
Connecticut	adult immigration			SA	SA	PA	PA	PA	PA	SA															
	adult emmigration			SA	SA	SA	SA	PA	PA	SA															
	spawning			SA	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	SA				
	juvenile emigration									SA	PA	PA	SA	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	SA													
	incubation						SA	PA	PA	PA	PA	SA	SA												
	juvenile freshwater residence						SA	SA	PA	PA	PA	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	PA	PA	PA	SA													
	incubation							SA	PA	PA	PA	SA													
	juvenile freshwater residence											SA	SA	PA	PA	PA	PA	SA	SA	SA	SA	SA	SA		
	juvenile emigration													SA	SA	SA	SA	SA	SA	SA	SA	SA	SA		

Source: ASMFC

6.3.3 Shads (American and hickory)

Life history and stock status are summarized below. Additional details may be found in the ASMFC's 2010 Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management) available at http://www.asmfc.org/shadRiverHerring.htm (the text below is adopted from that document).

The American shad is the largest North American member of the shad and herring family, and historically occurred in all major rivers from Maine through the east coast of Florida. The management units for American shad under this Fishery Management Plan Amendment include all migratory American shad stocks of the Atlantic coast of the United States.

American shad are a migratory anadromous fish that spend most of their life at sea along the Atlantic coast and enter freshwater as adults in the spring to spawn. Most young emigrate from their natal rivers during their first year of life. American shad stocks are river-specific; that is, each major tributary along the Atlantic coast appears to have a discrete spawning stock. In addition to ocean waters, habitats used by American shad include adult spawning sites in coastal tributaries and larval and juvenile nursery areas in the freshwater portions of the rivers and their associated bays and estuaries. American shad migration patterns are charted in table 19.

Less information is available specifically for hickory shad. Although the distribution and movements of hickory shad are essentially unknown after they return to the ocean, due to harvest along the southern New England coast in the summer and fall it is assumed that they also follow a migratory pattern similar to American shad (ASMFC 2010).

Stock Status

No assessments are available for Hickory Shad but many runs are likely below historical levels for reasons similar to those discussed below for Atlantic Shad. The most recent shad stock assessment report identified that shad stocks are highly depressed from historical levels. Of the 24 stocks of American and hickory shad for which sufficient information was available, 11 were depleted relative to historic levels, 2 were increasing, and 11 were stable (but still below historic levels). The status of 8 additional stocks could not be determined because the time-series of data was too short or analyses indicated conflicting trends. Taken in total, American shad stocks do not appear to be recovering. The assessment concluded that current restoration actions need to be reviewed and new ones need to be identified and applied. These include fishing rates, dam passage, stocking, and habitat restoration. There are no coast-wide reference points.

Table 22. Shad Migration Patterns (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	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

6.3.4 Current Analyses

Given the purposes of Amendment 14, new analyses for Amendment 14 centered on River Herrings and Shads. The methods, detailed in Appendix 2, estimated total incidental catch of river herring (alewife and blueback herring) and hickory and American shad (RHS) by fleet. Fleets included in the analyses were those sampled by the Northeast Fisheries Observer Program (NEFOP) and were stratified by region fished (Mid-Atlantic versus New England), time (year and quarter), gear group, and mesh size. Appendix 3, describes the FMAT's recommendations upon reviewing the analysis. The detailed results of these analyses are provided in Appendix 2, but as a summary table A1 from that Appendix is reproduced here for convenience:

Table 23. RH/S Catch Estimates and C.V.s. Midwater trawl starts in 2005.

	Alewife		American shad		Blueback herring		Herring NK		Hickory Shad	
Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
1989	20.35	0.49	58.92	0.60	19.60	0.39	7.08	1.03	0.00	
1990	55.31	0.68	25.81	0.34	78.94	0.44	331.34	0.72	0.00	
1991	68.24	0.48	104.27	0.25	115.41	0.37	110.46	0.48	39.35	0.00
1992	30.56	0.36	79.80	0.29	458.17	0.44	387.54	0.39	0.00	
1993	40.47	0.51	50.96	0.52	210.56	0.40	18.60	0.46	0.00	
1994	5.45	0.30	70.31	0.67	40.16	0.33	9.79	0.59	0.24	0.31
1995	6.36	0.48	17.17	0.41	213.50	0.43	51.89	1.44	0.02	1.42
1996	482.01	1.07	39.99	0.38	1803.43	2.10	28.68	0.43	26.64	0.82
1997	41.25	1.01	37.00	0.67	982.04	0.65	67.60	4.25	18.27	0.90
1998	80.88	1.47	55.31	0.43	49.32	1.27	0.42	0.65	39.19	1.45
1999	3.86	0.96	15.72	0.41	206.66	0.59	128.81	1.26	56.79	0.58
2000	28.37	0.67	74.39	1.82	55.46	0.37	21.96	0.53	0.06	0.80
2001	93.02	1.05	61.92	0.42	120.13	0.47	2.10	0.42	80.62	0.38
2002	2.72	3.86	24.07	0.41	173.23	0.31	76.51	1.85	1.41	1.05
2003	248.43	1.46	21.37	0.91	332.48	0.56	15.31	1.21	14.30	0.89
2004	99.74	0.93	18.16	0.35	81.54	0.47	176.74	0.74	35.03	0.78
2005	347.43	0.42	78.24	0.32	220.04	0.38	7.18	0.60	19.41	0.38
2006	57.61	0.91	29.29	4.37	187.48	0.67	232.02	1.16	13.35	0.81
2007	484.02	0.79	55.08	0.45	180.13	1.47	105.31	2.08	4.77	0.98
2008	145.03	0.43	52.38	0.32	526.59	0.57	327.99	0.40	7.83	0.65
2009	158.66	0.26	59.54	0.45	202.02	0.30	180.05	0.91	10.89	0.83
2010	118.50	0.20	46.12	0.17	125.02	0.20	86.50	0.32	1.12	0.65

As would hopefully be the case, the past and current analyses appear generally consistent to the degree that they can be compared. For example, in the new analyses the total catch of river herrings from 2005-2010 was 2,753 mt, with 32% or 881 mt caught in the Mid-Atlantic in quarter 1 by mid-water trawl vessels, which should be the mackerel fleet/fishery. 881 mt over 6 years is an average of 147 mt per year. This is pretty close to the 166 mt annual average estimated in specifications. The new analysis is substantially superior however in that like vessels are grouped together and then landings from those

similar vessels are used to generate estimates using the RH/S catch rates from those same kinds of grouped vessels.

When discards are subtracted from the catch estimates, the amount of "kept catch" of Atlantic Herring, for 2005-2010, closely matches the landings values in the dealer database, generally validating the catch estimation method. Comparisons for river herring and shad do not match in a similar fashion - this is not surprising given the reported discrepancies in reporting of landings of the four species.

Appendices 1 and 2 contain substantial discussion of estimated RH/S catch and will be referred to when discussing impacts of alternatives. For purposes of additional summary, key strata in terms of RH/S landings are listed below from Appendix 2:

Table 4 of Working Paper II summarizes estimated shad catch, by stratum, as a proportion of the total catch during 2005-2010.

The overall shad catches by gear type are as follows: Midwater Trawl (MWT): 42%; Large Mesh (5.5-8.0 in.) Gillnet: 27%; Small Mesh Bottom Trawl (SMBT): 26%.

The overall shad catches by area are as follows: Mid-Atlantic (M-A): 31%; New England (NE) 69%.

The overall shad catches by key quarter, area, and gear strata are as follows: Quarter 4 NE MWT: 13%; Q1 M-A MWT: 12%; Q3 NE MWT: 8%; Q3 NE Gillnet: (8%)Q4 NE Gillnet: (8%) (50% of total catch came from these 6 strata).

Table 5 of Working Paper II summarizes estimated river herring catch, by stratum, as a proportion of the total catch during 2005-2010.

The overall river herring catches by gear group are as follows: Midwater Trawl (MWT): 76%; Small Mesh (<= 3.5 in.) Bottom Trawl (SMBT): 24%.

The overall river herring catches by area are as follows: Mid-Atlantic (M-A): 44%; New England (NE) 56%.

The overall river herring catches by key quarter, area, and gear strata are as follows: Quarter 1 (Q1) M-A MWT: 35%; Q4 NE MWT: 16%; Q2 NE MWT: 11%; Q1 NE SMBT: 7%; Q3 NE MWT: 6%; Q3 NE SMBT: 5% (80% of total catch came from these 6 strata).

The key summary findings the FMAT concluded from these analyses are included in Appendix 3 and included the following points:

Lack of status information: Catch of river herring appears higher than shad but given the lack of coast-wide productivity and biological reference points for these stocks, it is not possible to quantify the impacts of these catches on stock status. This makes the impact analysis of alternatives extremely uncertain.

Overlap in managed/directed fisheries: Analysis of Atlantic herring and Atlantic mackerel landings suggests strong overlap between the two in terms of gear/mesh/area, especially in Q1 in the Mid-Atlantic.

Spatial-Temporal RH/S catch variability (observer data): GIS analyses of effort and catch rates of river herring and shad combined, by gear group, suggest that while there are some areas that appear to have high catch rates of RH/S and low effort, catch rates were generally highest in the areas where fishing effort was highest. The GIS analyses also indicated that areas with high catch rates during one time period may not show the same pattern in another time period.

Spatial-Temporal Effort and Directed Catch Variability: Analysis of the spatial distribution of effort by paired midwater trawls showed substantial variation among years. Analysis of the spatial distribution of mackerel catches also showed substantial variation when looking at one month to the next or the same month across years.

Spatial-Temporal catch variability in the Northeast Science Center Bottom Trawl RH/S: The results of earlier analyses showing substantial year-to-year variability in trawl survey catches of RH/S were noted. The sizes and locations of standard deviational ellipses that defined the core distributions of each species indicated a high degree of inter-annual variability during both spring and fall.

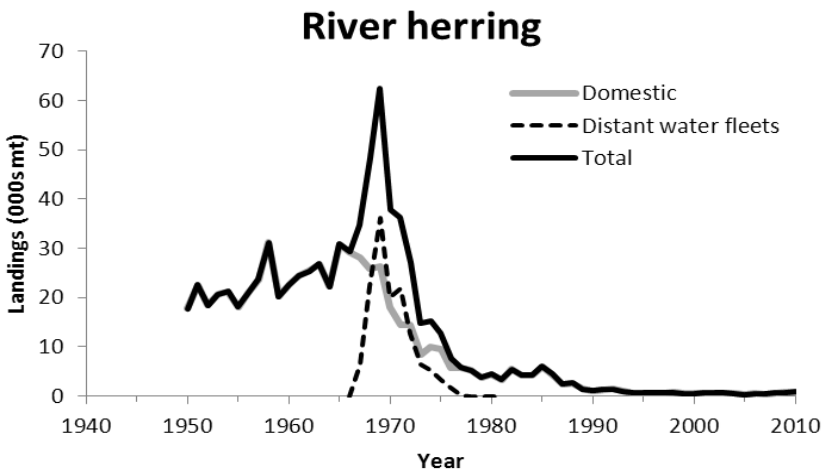
Comparison of catch estimates with landings

For 2005-2010, the ocean-intercept fisheries caught, on average, 63 mt of shad accordingly to the analysis described above. Shad landings provided by ASMFC over the same time period averaged 581 mt so ocean-intercept fisheries would appear to have represented a relatively low part of overall fishing mortality. The numbers in the analysis described above are best conceptualized as catch in ocean-intercept fisheries, which is why landings (much of which is riverine) can be so much higher.

For 2005-2010, the ocean-intercept fisheries caught, on average, 459 mt of river herring according to the analysis described above. River herring landings provided by ASMFC over the same time period averaged 601 mt so ocean-intercept fisheries would appear to have more relevance to river herring fishing mortality than shad fishing mortality. However, given the lack of reference points for any of the RH/S species, it is not possible to determine what effect, if any, these catch and/or landings quantities may be having on RH/S stocks.

For a historical perspective, the following figures provide river herring and shad landings over time per information provided by the ASMFC.

Figure 40. River Herring Landings



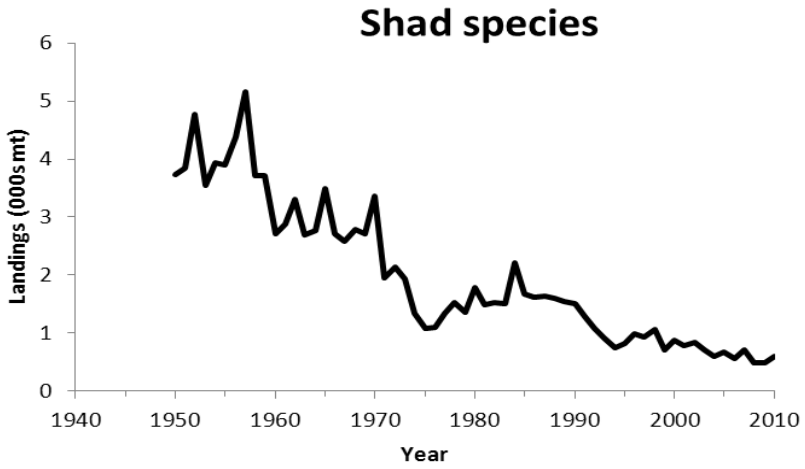


Figure 41. Shad Landings

RH/S Catch in the *Illex* and Longfin Squid Fisheries

The current analyses (Appendix 2) found that small mesh bottom otter trawling in the Mid-Atlantic in quarter 3 appears to account for a very small portion of river herring and shad catch (2.0 % and 4.5%, respectively), confirming preliminary findings that the *Illex* fishery does not appear to substantially catch RH/S. The *Illex* fishery operates almost exclusively with small mesh bottom otter trawling in the Mid-Atlantic during June-Oct (mainly quarter 3). This is also consistent with the small mesh bottom trawl GIS analysis which shows that catch rates of all four species are very low offshore during quarter 3 (Figure 34 in Appendix 2).

The story for longfin squid is more complex. The longfin squid fishery occurs in New England and Mid-Atlantic waters; inshore during May-Oct and offshore during Nov-April (see Amendment 10 to the MSB FMP). In addition to the longfin squid fishery, other bottom trawl fisheries included in the "small-mesh" bottom trawl catch category include Atlantic herring, whiting, and Atlantic mackerel. Across regions, small mesh bottom trawls accounted for about 25% of either river herring or shad catches. Working paper II (Appendix II) found that during 2005-2010, Mid-Atlantic small mesh bottom trawls accounted for 6% of river herring and 12% of shad catches. Working paper II also found that during 2005-2010, New-England small mesh bottom trawl accounted for 18% of river herring and 14% of shad catches.

However, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

Most shad catch for observed bottom small mesh (codend or liner less than 3.5 inches) was not associated with a targeted species so a similar analysis is not feasible but shad catches appear low as described above.

Conclusion

River herring and shad are caught in the MSB fisheries. The mackerel fishery appears to catch the most river herring in the MSB fisheries, which is not surprising given that mid-water trawl gear appears responsible for most river herring catch overall. The mackerel fishery also appears to catch low levels of shad. The longfin squid fishery appears to catch low levels of RH/S, and the *Illex* fishery appears to catch very low levels of shad and little if any river herring. Based on the analysis from Tables 17 and 19, the mackerel fishery likely catches several times more RH/S than the longfin squid fishery, which was primarily why the Council selected more management measures for the mackerel fishery compared to the longfin squid fishery. The gear/region/season-focused analysis conducted for this Amendment (see Appendix 2, especially table 3 of that Appendix) also suggests that small-mesh fishing for longfin squid likely accounts for a relatively small amount of overall RH/S catch.

6.4 Habitat (Including Essential Fish Habitat (EFH))

Pursuant to the Magnuson Stevens Act / EFH Provisions (50 CFR Part 600.815 (a)(1)), an FMP must describe EFH by life history stage for each of the managed species in the plan. This information was previously described in Amendment 8 to the MSB FMP and was updated via Amendment 11 to the MSB FMP. EFH for the managed resource is described using fundamental information on habitat requirements by life history stage that is summarized in a series of documents produced by NMFS and available at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. This series of documents, as well as additional reports and publications, are used to provide the best available information on life history characteristics, habitat requirements, as well as ecological relationships. Matrices of habitat parameters (i.e. temperature, salinity, light, etc.) for eggs/larvae and juveniles/adults were developed in the mackerel, longfin squid and *Illex* squid and butterfish EFH background documents described above. Amendment 8 to the MSB FMP identified and described essential fish habitat for mackerel, longfin squid (except for eggs), *Illex*, and

butterfish, summarized below. Amendment 9 to the MSB FMP identified and described essential fish habitat for longfin squid eggs. Amendment 11 updated all of the EFH designations for MSB species and the associated textual descriptions and maps may be viewed here: http://mafmc.org/fmp/history/smb-hist.htm.

In general, the EFH for the MSB species is the water column itself, and the species have temperature and prey preferences/needs that drive the suitability of any particular area/depth, thus fishing activity has minimal impacts. Longfin squid also use hard bottom, submerged vegetation, other natural or artificial structure, and sand or mud to attach/anchor eggs, but there are no known preferences for different types of substrates or indications that fishing activity may negatively impact longfin squid egg EFH.
The source documents cited above for RH/S and Atlantic herring may be consulted for additional habitat information for those species.

There are other lifestages of federally-managed species that have designated EFH that may be susceptible to adverse impacts from bottom-tending mobile gear as described below:

Table 23b. EFH descriptions for federally-managed species/life stages in the U.S. Northeast Shelf Ecosystem that are vulnerable to bottom tending fishing gear.

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
American plaice	juvenile	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 150	Fine grained sediments, sand, or gravel
American plaice	adult	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 175	Fine grained sediments, sand, or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75	Cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150	Rocks, pebbles, or gravel
Atl halibut	juvenile	GOM and GB	20 - 60	Sand, gravel, or clay
Atl halibut	adult	GOM and GB	100 - 700	Sand, gravel, or clay
Barndoor skate	juvenile/ adult	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0-750, most < 150	Mud, gravel, and sand
Black sea bass	juvenile	GOM to Cape Hatteras, NC, including estuaries from Buzzards Bay to Long Island Sound, Gardiners Bay, Barnegat Bay to Chesapeake Bay, Tangier/ Pocomoke Sound, and James River	1 - 38	Rough bottom, shellfish/ eelgrass beds, manmade structures, offshore clam beds, and shell patches
Black sea bass	adult	GOM to Cape Hatteras, NC, including Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay, and James River	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile/ adult	GOM, along continental shelf to Cape Hatteras, NC, including the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, most < 111	Soft bottom and rocky or gravelly bottom
Haddock	juvenile	GB, GOM, and Mid-Atlantic south to Delaware Bay	35 - 100	Pebble and gravel
Haddock	adult	GB, eastern side of Nantucket Shoals, and throughout GOM	40 - 150	Broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Little skate	juvenile/ adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes estuaries from Buzzards Bay south to mainstem Chesapeake Bay	0-137, most 73 - 91	Sandy or gravelly substrate or mud

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Ocean pout	eggs	GOM, GB, SNE, and Mid-Atlantic south to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay and Cape Cod Bay	<50	Generally sheltered nests in hard bottom in holes or crevices
Ocean pout	juvenile	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, and Cape Cod Bay	< 50	Close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, MA Bay, Boston Harbor, and Cape Cod Bay	< 80	Smooth bottom near rocks or algae
Pollock	adult	GOME, GB, SNE, and Mid-Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., MA Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off SNE, and Mid-Atlantic south to Cape Hatteras, including the following estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, and Chesapeake Bay	< 100	Shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras, these estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130	In sand and mud, in depressions
Redfish	juvenile	GOM, southern edge of GB	25 - 400	Silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50 - 350	Silt, mud, or hard bottom
Rosette skate	juvenile/ adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, most 74-274	Soft substrate, including sand/mud bottoms
Scup	juvenile/ adult	GOM to Cape Hatteras, NC, including the following estuaries: MA Bay, Cape Cod Bay to Long Island Sound, Gardiners Bay to Delaware inland bays, and Chesapeake Bay	0-38 for juv 2-185 for adult	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, ME, MA Bay to Cape Cod Bay	20 – 270	All substrate types
Summer Flounder	juvenile/ adult	GOM to Florida – estuarine and over continental shelf to shelf break	0-250	Demersal/estuarine waters, varied substrates. Mostly inshore in summer and offshore in winter.
Smooth skate	juvenile/ adult	Offshore banks of GOM	31–874, most 110-457	Soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile/ adult	GOM and GB	18-2000, most 111-366	Sand, gravel, broken shell, pebbles, and soft mud
Tilefish	juvenile/ adult	Outer continental shelf and slope from the U.S./Canadian boundary to the Virginia/North Carolina boundary	100 - 300	Burrows in clay (some may be semi-hardened into rock)
White hake	juvenile	GOM, southern edge of GB, SNE to Mid-Atlantic and the following estuaries: Passamaquoddy Bay, ME to Great Bay, NH, Massachusetts Bay to Cape Cod Bay	5 - 225	Seagrass beds, mud, or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, SNE, Mid- Atlantic south to Delaware Bay and the estuaries from Passamaquoddy Bay, ME to Chincoteague Bay, VA	1 - 100	Mud, sand, and gravel
Winter skate	juvenile/ adult	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, most < 111	Sand and gravel or mud
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Fine grained substrate

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Yellowtail flounder	adult	GB, GOM, SNE and Mid-Atlantic south to Delaware Bay and these estuaries: Sheepscot River and Casco Bay, ME, MA Bay to Cape Cod Bay	20 - 50	Sand or sand and mud

For reference purposes, there are two primary gear types in use in the mackerel and longfin squid fisheries, mid-water trawl and bottom-otter trawl. Mid water trawling, as the name suggests, would not be expected to have substantial contact with the bottom. Bottom-otter trawls on the other hand are fished on the bottom. Habitat disturbance depends on how heavily or lightly the gear is fished on the bottom and can occur from the metal doors that spread the net along the bottom or from the net itself or attachments to the net (for example chaff guards) that make contact with the bottom.

The source documents cited above for RH/S and Atlantic herring may be consulted for additional habitat information for those species.

6.5 Endangered and Protected Species

There are numerous species which inhabit the environment within the management unit of this FMP that are afforded protection under the Endangered Species Act (ESA) of 1973 (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA). 18 are classified as endangered or threatened under the ESA, while the rest are protected by the provisions of the MMPA. The subset of these species that are known to have interacted with the MSB fisheries is provided in this document section. The Council has determined that the following list of species protected either by the Endangered Species Act of 1973 (ESA), the Marine Mammal Protection Act of 1972 (MMPA), or the Migratory Bird Treaty Act of 1918 may be found in the environment utilized by Atlantic mackerel, squid and butterfish fisheries:

This list 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 candidate species known to occur within the action area of the MSB fisheries and have documented interactions with types of gear used in MSB fisheries.

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. The Protected Resources Division of the NMFS Northeast Regional Office has initiated review of recent stock assessments, discards information, and other information for these candidate species which will be incorporated in the status review reports for both candidate species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information from these reviews. Please note that the conference provisions apply only if a candidate species is proposed for listing (and thus, becomes a proposed species) (see 50 CFR 402.10)."

* = Known to have interacted with MSB fisheries or gear types

Cetaceans

Species	Status
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Beaked whales (*Ziphius and Mesoplodon spp*.)	Protected
*Risso's dolphin (*Grampus griseus*)	Protected
*Pilot whale (*Globicephala spp*.)	Protected
*White-sided dolphin (*Lagenorhynchus acutus*)	Protected
*Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella spp*.)	Protected
*Bottlenose dolphin (*Tursiops truncatus*)	Protected

Pinnipeds

Species	
*Harbor Seal (Phoca vitulina concolor)	Protected
*Gray Seal (Halichoerus grypus grypus)	Protected
*Harp Seal (Pagophilus groenlandicus)	Protected

Sea Turtles

Species	Status
*Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
*Loggerhead sea turtle (*Caretta caretta*)	Threatened (Northwest Atlantic DPS)

Fish

Species	Status
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered (Gulf of Maine DPS)
*Atlantic sturgeon (*Acipenser oxyrinchus*)	
Gulf of Maine DPS	Threatened
New York Bight DPS	Endangered
Chesapeake Bay DPS	Endangered
Carolina DPS	Endangered
South Atlantic DPS	Endangered
Cusk (*Brosme brosme*)	Candidate
Alewife (*Alosa pseudoharengus*)	Candidate

Blueback herring (*Alosa aestivalis*)	Candidate

Birds

Species	Status
*Northern Gannet (*Morus bassanus*)	Protected

Protected Species Interactions with the Managed Resources – Includes Fishery Classification under Section 118 of Marine Mammal Protection Act

Species	Status
Common dolphin (*Delphinus delphis*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Harbor, Grey, and Harp Seals	Protected

Under section 118 of the MMPA, the NMFS must publish and annually update the List of Fisheries, which places all U.S. commercial fisheries in one of three categories based on the level of serious injury and mortality of marine mammals in each fishery (arranging them according to a two tiered classification system). The categorization of a fishery in the List of Fisheries determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, NEFOP observer coverage, and take reduction plan requirements. The classification criteria consists of a two tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock (Tier 1) and then addresses the impact of the individual fisheries on each stock (Tier 2). If the total annual mortality and serious injury of all fisheries that interact with a stock is less than 10% of the Potential Biological Removal for the stock then the stock is designated as Tier 1 and all fisheries interacting with this stock would be placed in Category III. Otherwise, these fisheries are subject to categorization under Tier 2. Potential Biological Removal is the product of minimum population size, one-half the maximum productivity rate, and a "recovery" factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The current (2011) list of fisheries is available at: http://www.nmfs.noaa.gov/pr/interactions/lof/.

Under Tier 2, individual fisheries are subject to the following categorization:

Category I. Annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50% of the Potential Biological Removal level;

Category II. Annual mortality and serious injury of a stock in a given fishery is greater than one percent and less than 50% of the Potential Biological Removal level; or

Category III. Annual mortality and serious injury of a stock in a given fishery is less than one percent of the Potential Biological Removal level.

Note: unlike the rest of this document, incidental take of marine mammals or endangered species does not mean that they were retained or landed.

In Category I, there is documented information indicating a "frequent" mortality and injury of marine mammals in the fishery. In Category II, there is documented information indicating an "occasional" mortality and injury of marine mammals in the fishery. In Category III, there is information indicating no more than a "remote likelihood" of an incidental taking of a marine mammal in the fishery or, in the absence of information indicating the frequency of incidental taking of marine mammals, other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, and species and distribution of marine mammals in the area suggest there is no more than a remote likelihood of an incidental take in the fishery. "Remote likelihood" means that annual mortality and serious injury of a stock in a given fishery is less than or equal to 10% of the Potential Biological Removal level or, which it is highly unlikely that any marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period or, in the absence of reliable information it is at the discretion of the Assistant Administrator for Fisheries to determine whether the injury or mortality qualifies (or not) for a specific category.

Marine Mammal Stock Assessment Reports:

As required by the Marine Mammal Protection Act (MMPA), NMFS has incorporated earlier public comments into revisions of marine mammal stock assessment reports (SARs). These reports contain information regarding the distribution and abundance of the stock, population growth rates and trends, the stock's Potential Biological Removal level, estimates of annual human-caused mortality and serious injury from all sources, descriptions of the fisheries with which the stock interacts, and the status of the stock. The MMPA requires these assessments to be reviewed at least annually for strategic stocks and stocks for which significant new information is available, and at least once every 3 years for non-strategic stocks. The most recent SARs are available at: http://www.nmfs.noaa.gov/pr/sars/.

NMFS elevated the (mid-water) MSB fishery to Category I in the 2001 List of Fisheries but it was reduced to a Category II fishery in 2007 (see discussion below describing the Atlantic Trawl Gear Take Reduction Plan). The reduction in interactions documented between the MSB fisheries and several species/stocks of marine mammals compared to previous years led to the re-classification. No classification changes have occurred since 2007

6.5.1 Description of species that are known to interact with MSB fisheries

The following is a description of species that are protected under the MMPA and, as discussed above, have had documented interactions with fishing gears used to harvest species managed under this FMP (i.e. may interact with the Atlantic Mackerel Squid and Butterfish fisheries):

Common dolphin (PBR = 1000, all fisheries annual take 2005-2009 = 164)

The common dolphin may be one of the most widely distributed species of cetaceans, as it is found worldwide in temperate, tropical, and subtropical seas. They are widespread from Cape Hatteras

northeast to Georges Bank (35 to 42 North latitude) in outer continental shelf waters from mid-January to May. Exact total numbers of common dolphins off the US or Canadian Atlantic coast are unknown, although the most recent Stock Assessment Report considers the best abundance estimate for common dolphins to be 120,743 animals (Coefficient of Variation (CV) =0.23). This is the sum of the estimates from two 2004 U.S. Atlantic surveys, where the estimate for the northern U.S. Atlantic is 90,547 (CV=0.24) and 30,196 (CV=0.54) for the southern U.S. Atlantic. PBR for the western North Atlantic common dolphin is 1000. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/) for more life history information.

Fishery Interactions - The following fishery interaction information was taken from the latest stock assessment for common dolphin contained in Waring *et al.* (2011) which summarizes incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2011).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2005-2009 average annual mortality attributed to the northeast bottom trawl was 23 animals (CV=0.13). The 2005-2009 average annual mortality attributed to the Mid-Atlantic bottom trawl was 110 animals (CV=0.13). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality of common dolphin during the five year period 2005-2009 in the Mid-Atlantic bottom trawl fishery was 110 animals (CV=0.13). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 1 (CV=0.7) during the five year period 2005-2009. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Atlantic white-sided dolphin (*Lagenorhynchus acutus*) (PBR = 190, all fisheries annual take 2005-2009 = 245)

Atlantic white-sided dolphins (*Lagenorhynchus acutus)* are found in temperate and sub-polar waters of the North Atlantic, primarily in continental shelf waters to the 100m depth contour. The exact total number of white-sided dolphins (*Lagenorhynchus acutus)* along the eastern US and Canadian Atlantic coast is unknown, although the best available current abundance estimate for white-sided dolphins in the western North Atlantic stock is 23,390 (CV=0.23), the sum of the 2006 and 2007 surveys. PBR for the western North Atlantic stock of white-sided dolphin (*Lagenorhynchus acutus)* is 190. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/)for more life history information.

Fishery Interactions - The following information was taken from the latest stock assessment for white-sided dolphin (*Lagenorhynchus acutus)* contained in Waring *et al* (2011) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2011).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2005-2009 average annual mortality attributed to the northeast bottom trawl was 160 animals (CV=0.14). The 2005-2009 average annual mortality attributed to the Mid-Atlantic

bottom trawl was 23 animals (CV=0.12). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during the five year period 2005-2009 in the Mid-Atlantic bottom trawl fishery was 23 animals (CV=0.12). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 24 (CV=0.55) during the five year period 2005-2009. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Long-finned (*Globicephala melas*) and short-finned (*Globicephala macrorhynchus*) pilot whales (PBR = 265, all fisheries annual take 2005-2009 = 162)

There are two species of pilot whales in the Western Atlantic - the Atlantic (or long-finned) pilot whale, *Globicephala melas*, and the short-finned pilot whale, *G. macrorhynchus*. These species (sp.) are difficult to identify to the species level at sea. Preliminary analysis suggests the following distribution of the two species: sightings south of the mouth of the Chesapeake Bay are likely short-finned pilot whales, as are offshore (near the 4,000m depth contour) sightings from off the mouth of the Chesapeake Bay through off New Jersey. Sightings from the mouth of the Chesapeake Bay to the Southern Edge of Georges Bank along the 100/1,000 m depth contours are likely mixed. Sightings in the Gulf of Maine and east and north of Cape Cod are likely long-finned pilot whales, as are sightings in shelf waters immediately southeast of Nantucket. The minimum population size for short-finned pilot whales is estimated to be 17,190 and the minimum population size for long-finned pilot whales is estimated to be 9,333. PBR for short-finned pilot whales is estimated to be 172 and PBR for long-finned pilot whales is estimated to be 93 (total is 265). See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/) for more life history information.

Fishery Interactions - The following information was taken from the latest stock assessment for pilot whales (*Globicephala* sp.) contained in Waring *et al* (2011) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2011).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2005-2009 average annual mortality attributed to the northeast bottom trawl was 12 animals (CV=0.14). The 2005-2009 average annual mortality attributed to the Mid-Atlantic bottom trawl was 30 animals (CV=0.16). The portion attributable to the directed *Illex*/longfin squid fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during the five year period 2005-2009 in the Mid-Atlantic bottom trawl fishery was 30 animals (CV=0.16). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 2.4 (CV=0.99) during the five year period 2005-2009. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Risso's dolphin (*Grampus griseus*) (PBR = 124, all fisheries annual take 2005-2009 = 18)

Risso's dolphins are distributed worldwide in tropical and temperate seas, and in the Northwest Atlantic occur from Florida to eastern Newfoundland. Off the northeast U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during spring, summer, and autumn. In winter, the range is in the Mid-Atlantic Bight and extends outward into oceanic waters. The minimum population estimate for the western North Atlantic Risso's dolphin is 12,920. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm219/) for more life history information.

Fishery Interactions - NMFS foreign-fishery observers reported four deaths of Risso's dolphins incidental to squid and mackerel fishing activities in the continental shelf and continental slope waters between March 1977 and December 1991. In the pelagic pair trawl fishery, one mortality was observed in 1992.

Mid-Atlantic Mid-water Trawl

One Risso's dolphin mortality was observed in this fishery for the first time in 2008. No discards estimate has been generated.

Bottlenose dolphin (*Tursiops truncatus*) Offshore Form. (PBR = 566, all fisheries take is unknown)

There are two morphologically and genetically distinct bottlenose dolphin morphotypes described as the coastal and offshore forms. Both inhabit waters in the western North Atlantic Ocean along the U.S. Atlantic coast. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/) for more life history information.

Fisheries Information

During 2007-2011, five offshore bottlenose dolphins were observed in the Northeast bottom trawl fishery: 4 in 2007 and 1 in 2010. In this same 5-year period, eight animals were observed in the mid-Atlantic bottom trawl fishery: 1 in 2009, 5 in 2010, and 2 in 2011. The offshore bottlenose dolphin stock assessment is presently under revision and will be published in the 2013 stock assessment report.

Earlier Interactions

Thirty-two bottlenose dolphin mortalities were observed in the pelagic pair trawl fishery between 1991 and 1995. Estimated annual fishery-related mortality (CV in parentheses) was 13 dolphins in 1991 (0.52), 73 in 1992 (0.49), 85 in 1993 (0.41), 4 in 1994 (0.40) and 17 in 1995 (0.26).

Although there were reports of bottlenose dolphin mortalities in the foreign squid mackerel butterfish fishery during 1977-1988, there were no fishery-related mortalities of bottlenose dolphins reported in the self-reported fisheries information from the mackerel trawl fishery during 1990-1992.

One bottlenose dolphin mortality was documented in the North Atlantic bottom trawl in 1991 and the total estimated mortality in this fishery in 1991 was 91 (CV=0.97).

Harbor Seals

The harbor seal is found in all nearshore waters of the North Atlantic and North Pacific Oceans and adjoining seas above about 30ºN. In the western North Atlantic, they are distributed from the eastern Canadian Arctic and Greenland south to southern New England and New York, and occasionally to the Carolinas. Present data are insufficient to calculate a minimum population estimate for this stock. There are insufficient data to determine the population trends for this stock.

In Northeast Bottom Trawl fisheries, seven harbor seal mortalities were observed between 2001 and 2007, 1 in 2002, 1 in 2005, 3 in 2007, 0 in 2008, and 1 in 2009. The estimated annual fishery-related mortality and serious injury attributable to this fishery has not been generated. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/) for more information.

Grey Seals

The gray seal is found on both sides of the North Atlantic, with three major populations: eastern Canada, northwestern Europe and the Baltic Sea. The western North Atlantic stock is equivalent to the eastern Canada population, and ranges from New York to Labrador. Current estimates of the total western Atlantic gray seal population are not available. Gray seal abundance is likely increasing in the U.S. Atlantic Exclusive Economic Zone (EEZ), but the rate of increase is unknown.

Vessels in the North Atlantic bottom trawl fishery, a Category III fishery under MMPA, were observed in order to meet fishery management, rather than marine mammal management needs. No mortalities were observed prior to 2005, when four mortalities were attributed to this fishery. No mortalities were observed in 2006. The estimated annual fishery-related mortality and serious injury attributable to this fishery was 0 between 2001 and 2004, and for 2006. Nine gray seal mortalities were attributed to this fishery in 2007, 4 in 2008 and 8 in 2009. Total estimates have not been generated. See Waring *et al*. 2011 (http://www.nefsc.noaa.gov/publications/tm/tm221/) for more information.

Harp Seals

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans. Since the early 1990s, numbers of sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey. These usually occur in January-May when the western North Atlantic stock of harp seals is at its most southern point of migration. The best estimate of abundance for western North Atlantic harp seals is 6.9 million. The minimum population estimate based on the 2008 pup survey results is 6.5 million seals. Data are insufficient to calculate the minimum population estimate for U.S. waters.

Four mortalities were observed in the Northeast bottom trawl fishery between 2002 and 2009. The estimated annual fishery-related mortality and serious injury attributable to this fishery (CV in parentheses) was 0 between 1991 and 2000, 49 (CV=1.10) in 2001, and 0 in 2002-2004, and 0 in 2006–2008. Estimates have not been generated for 2005 or 2009.

6.5.2 Atlantic Trawl Gear Take Reduction Plan

In September 2006, the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) convened the Atlantic Trawl Gear Take Reduction Team (ATGTRT) under the Marine Mammal Protection Act (MMPA). The ATGTRT was convened to address incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in several trawl gear fisheries operating in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic Mid-Water Trawl, the Mid-Atlantic Bottom Trawl, Northeast Mid-Water Trawl and the Northeast Bottom Trawl fisheries.

Section 118 of the MMPA establishes a method for managing incidental interactions between marine mammals and commercial fisheries. Under section 118, Take Reduction Plans (Take Reduction Plans) are developed to identify actions necessary to conserve and protect strategic marine mammal stocks[1] that interact with Category I and II fisheries.[2] The immediate goal of a Take Reduction Plan is to reduce, within six months of implementation, the incidental serious injury or mortality of marine mammals from commercial fishing to levels less than Potential Biological Removal. The long-term goal is to reduce, within five years of its implementation, the incidental serious injury and mortality of marine mammals from commercial fishing operations to insignificant levels approaching a zero serious injury and mortality rate, taking into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans.

Take Reduction Teams (TRTs) consisting of representatives from the fishing industry, fishery management councils, state and federal resource management agencies, the scientific community and conservation organizations develops the Take Reduction Plan while NMFS is responsible for its implementation. After a Take Reduction Plan is finalized, the Take Reduction Team and NMFS meet periodically to monitor implementation of the plan and update as necessary. Take reduction plans must recommend regulatory or voluntary measures for the reduction of incidental mortality and serious injury; and recommend dates for achieving the specific objectives of the plan.

Presently, none of these marine mammal stocks under consideration by the ATGTRT are classified as a strategic stock nor do they currently interact with a Category I fishery.
At its first meeting the ATGTRT raised several issues critical to the take reduction planning process and the development of an Atlantic Trawl Gear Take Reduction Plan. The ATGTRT requested clarification of the requirements under the MMPA for development of a take reduction plan for marine mammal stocks that are non-strategic and that do not interact with Category I fisheries. Specifically, the ATGTRT wanted to know if the 11 month timeline specified in the MMPA for the development of a Take Reduction Plan and the 5 year timeline for reaching Zero Mortality Rate Goal apply under the specific circumstances of

[1] The MMPA defines the term "strategic stock" to mean a marine mammal stock (A) for which the level of direct human-caused mortality exceeds the potential biological removal level; (B) …..is declining and is likely to be listed as a threatened species under the Endangered Species Act (ESA) of 1973 within the foreseeable future; or (C) ….is listed as a threatened or endangered species under the ESA or is designated as a depleted stock under this Act. The term "potential biological removal level" means 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.

[2] NMFS must publish, at least annually, a List of Fisheries that classifies U.S. commercial fisheries into one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals in each fishery:
• Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing;
• Category II designates fisheries with occasional serious injuries and mortalities;
• Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

the ATGTRT. The ATGTRT also requested that NMFS conduct a Tier Analysis for the 2007 annual List of Fisheries to verify whether the Squid, Mackerel Butterfish Fishery (Mid-Atlantic Midwater Trawl Fishery) should remain as a Category I fishery or be reclassified as a Category II fishery.

NOAA General Counsel provided detailed legal guidance regarding the Take Reduction Plan timeline and requirements for development of a Take Reduction Plan for marine mammal stocks that are non-strategic in response to questions raised by the ATGTRT. In short, NOAA's General Counsel legal guidance stated that neither the 11 month timeline for the development of a Take Reduction Plan nor the 5 year goal for reaching a Zero Mortality Rate Goal apply to non-strategic stocks that do not interact with Category I fisheries.

The ATGTRT agreed that while a Atlantic Trawl Gear Take Reduction Plan may not be required at this time[3], efforts should be made to identify and conduct research necessary to identify measures to reduce serious injury and mortality of marine mammals in Atlantic trawl fisheries and, ultimately, to achieve the MMPA's Zero Mortality Rate Goal through a trawl take reduction research plan. This information is captured in the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS).[4]

In addition, the ATGTRT recommended that certain voluntary measures be implemented immediately for the Atlantic trawl fisheries in defined areas. NMFS funded outreach placards highlighting these voluntary measures. The placards were designed in collaboration with Garden State Seafood Association, who is also a member of the ATGTRT.

The ATGTRT recommended that two plans be developed to achieve the overall goal of the Take Reduction Strategy to reduce the incidental take of marine mammals in Atlantic trawl fisheries. These include an Education and Outreach Plan and a Research Plan as part of an overall take reduction strategy. The ATGTRT established two sub-groups to develop the Education and Outreach and Research Plans. The Education and Outreach Plan identifies activities that promote the exchange of information necessary to reduce the catch of marine mammals in Atlantic trawl fisheries. The Research Plan identifies information and research needs necessary to improve our understanding of the factors resulting in catch in Atlantic trawl fisheries. The results of the identified research will be used to direct additional research and/or identify measures to reduce the serious injury and mortality of short- and long-finned pilot whales, Atlantic white-sided dolphins, and common dolphins in trawl fisheries to levels approaching the Zero Mortality Rate Goal . The Atlantic Trawl Gear Take Reduction Strategy is available at: http://www.nero.noaa.gov/prot_res/atgtrp/.

[3] At the April 2007 meeting, the ATGTRT tabled the discussion of the NOAA General Counsel legal guidance without reaching consensus, with some members questioning the conclusions reached by NOAA General Counsel. The ATGTRT agreed to focus on areas of consensus; specifically the need to identify and implement research and education and outreach initiatives to reduce serious injury and mortality of marine mammals in Atlantic trawl fisheries and ultimately to achieve the MMPA goal of reducing marine takes to Zero Mortality Rate Goal (ZMRG).

[4] The Atlantic Trawl Gear Take Reduction Strategy (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 has identified several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. The tasks identified by this ATGTRS are necessary to make reasoned management decisions that could provide the basis for any future take reduction plan should it be determined that a Take Reduction Plan is needed.

6.5.3 Description of Turtle Species with Documented Interactions with the MSB Fisheries

The October 2010 Biological Opinion for the MSB (http://www.nero.noaa.gov/prot_res/section7/NMFS-signedBOs/MSB%20BIOP%202010.pdf) fisheries contains detailed information on sea-turtle interactions with trawl gear in the MSB fisheries, and updated information is provided in Warden (2011a, 2011b). Summary information is provided below.

The primary species likely to be adversely affected by the MSB fishery would be loggerhead sea turtles, as they are the most abundant species occurring in U.S. Atlantic waters. Sea sampling and observer data indicate that fewer interactions occur between fisheries that capture MSB and leatherback, Kemp's ridley, and green sea turtles. The primary area of impact of the directed commercial fishery for MSB on sea turtles is likely bottom otter trawls in waters of the Mid-Atlantic from Virginia through New York, from late spring through fall (peak longfin squid abundance July-October). In New England, interactions with trawl gear may occur in summer through early fall (peak squid abundance August -September), although given the level of effort, the probability of interactions is much lower than in the Mid-Atlantic.

There were 9 observed sea turtle takes in the MSB fishery during 2001-2011 (using top species landed). All sea turtle takes have occurred in bottom otter trawl gear participating in the squid fishery. Based on data collected by observers for the reported sea turtle captures in or retention in MSB trawl gear, the NEFSC estimated loggerhead catch in the MSB trawl fishery between 2000-2004 (Murray 2008) was 62 animals annually. NMFS estimates 2 leatherback, 2 green, and 2 Kemp's ridley turtles are taken each year based on the very low encounter rates for these species and/or unidentified turtles.

On July 12, 2007, NMFS and U.S. Fish and Wildlife Service (Services) received a petition from Center for Biological Diversity and Turtle Island Restoration Network to list the ''North Pacific populations of loggerhead sea turtle'' as an endangered species under the ESA. In addition, on November 15, 2007, the Services received a petition from Center for Biological Diversity and Oceana to list the ''Western North Atlantic populations of loggerhead sea turtle'' as an endangered species under the ESA. NMFS published notices in the *Federal Register*, concluding that the petitions presented substantial scientific information indicating that the petitioned actions may be warranted (72 FR 64585, November 16, 2007; 73 FR 11849; March 5, 2008). In 2008, a Biological Review Team (BRT) was established to assess the global population structure to determine whether DPSs exist and, if so, the status of each DPS. The BRT identified nine loggerhead DPSs, distributed globally (Conant et al. 2009). On March 16, 2010, the Services announced 12-month findings on the 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 September 22, 2011, NMFS and U.S. Fish and Wildlife Service issued a final rule (76 FR 58868), determining that the loggerhead sea turtle is composed of nine DPSs (as defined in Conant et al., 2009) that constitute species that may be listed as threatened or endangered under the ESA. Five DPSs were listed as endangered (North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Northeast Atlantic Ocean, and Mediterranean Sea), and four DPSs were listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean). Note that the Northwest Atlantic Ocean (NWA) DPS and the Southeast Indo-Pacific Ocean DPS were original proposed as endangered. The NWA DPS was determined to be threatened based on review of nesting data

available after the proposed rule was published, information provided in public comments on the proposed rule, and further discussions within the agencies. The two primary factors considered were population abundance and population trend. NMFS and U.S. Fish and Wildlife Service found that an endangered status for the NWA DPS was not warranted given the large size of the nesting population, the overall nesting population remains widespread, the trend for the nesting population appears to be stabilizing, and substantial conservation efforts are underway to address threats.

The September 2011 final rule also noted that critical habitat for the two DPSs occurring within the U.S. (NWA DPS and North Pacific DPS) will be designated in a future rulemaking. Information from the public related to the identification of critical habitat, essential physical or biological features for this species, and other relevant impacts of a critical habitat designation was solicited.

This proposed action only occurs in the Atlantic Ocean. As noted in Conant et al. (2009), the range of the four DPSs occurring in the Atlantic Ocean are as follows: NWA DPS – north of the equator, south of 60° N latitude, and west of 40° W longitude; Northeast Atlantic Ocean (NEA) DPS – north of the equator, south of 60° N latitude, east of 40° W longitude, and west of 5° 36' W longitude; South Atlantic DPS – south of the equator, north of 60° S latitude, west of 20° E longitude, and east of 60° W longitude; Mediterranean DPS – the Mediterranean Sea east of 5° 36' W longitude. These boundaries were determined based on oceanographic features, loggerhead sightings, thermal tolerance, fishery data, and information on loggerhead distribution from satellite telemetry and flipper tagging studies. Sea turtles from the NEA DPS are not expected to be present over the North American continental shelf in U.S. coastal waters, where the proposed action occurs (P. Dutton, NMFS, personal communication, 2011). Previous literature (Bowen et al. 2004) has suggested that there is the potential, albeit small, for some juveniles from the Mediterranean DPS to be present in U.S. Atlantic coastal foraging grounds.

These data should be interpreted with caution however, as they may be representing a shared common haplotype and lack of representative sampling at Eastern Atlantic rookeries. Given that updated, more refined analyses are ongoing and the occurrence of Mediterranean DPS juveniles in U.S. coastal waters is rare and uncertain, if even occurring at all, for the purposes of this assessment we are making the determination that the Mediterranean DPS is not likely to be present in the action area. Sea turtles of the South Atlantic DPS do not inhabit the action area of this subject fishery (Conant et al. 2009). As such, the remainder of this assessment will only focus on the NWA DPS of loggerhead sea turtles, listed as threatened.

6.5.4 Birds

Northern Gannet (*Morus bassanus*)

The Northern gannet is a migratory seabird federally protected in the U.S. and Canada. Gannets spend the boreal summer along coastal Canada and the winter along the U.S. East Coast continental shelf waters. North American breeding colonies exist at 6 main sites in the Gulf of St. Lawrence and along the Atlantic coast of Newfoundland. During the nesting season, March – November, birds forage throughout the North Atlantic from the Bay of Fundy, off the coasts of Newfoundland, Labrador and Greenland and throughout the Gulf of St. Lawrence. Dispersal from breeding sites begins in September, where gannets migrate south along the Northeast Atlantic coast and are considered common winter residents off most

Northeast coastal states. Primary prey of the Northern gannet include herring, mackerel and squids. North American breeding population has been increasing since the early 1970's and in 2000 the population was estimated at 144,596 individuals. Northern gannets were not listed as a species of conservation concern by the U.S. Fish and Wildlife Service in 2008.

Northern gannet Fishery Interactions:

Illex squid: No interactions observed for 2004 – 2008.

Longfin squid: For 2004 to 2008, one Northern Gannet take was observed in March of 2004.

Atlantic mackerel: For 2004 to 2008 a total of 62 Northern Gannets have been observed (2004, n = 17; 2005, n = 1; 2006, n = 2; 2007, n = 30; 2008, n = 12).

Butterfish: Given recent restrictions on butterfish landings it is difficult to even define a directed butterfish fishery – landings are generally incidental to other fishing.

6.5.5 Atlantic Sturgeon

In 2012 NOAA's Fisheries Service announced a final decision to list five distinct population segments (DPS) of Atlantic sturgeon under the Endangered Species Act. The Chesapeake Bay, New York Bight, Carolina, and South Atlantic DPSs of Atlantic sturgeon were listed as endangered, while the Gulf of Maine DPS was listed as threatened. Atlantic sturgeon from any of the five DPSs could occur in areas where MSB fisheries operate, and the species has been captured in gear targeting longfin squid (Stein et al. 2004a, ASMFC 2007). Therefore, this Environmental Assessment includes background information on Atlantic sturgeon in this section and considers the anticipated effects of the action on Atlantic sturgeon in Section 7 of this Environmental Assessment.

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. There are no total population size estimates for any of the 5 Atlantic sturgeon DPSs at this time. However, there are two estimates of spawning adults per year for two river systems (e.g., 863 spawning adults for the Hudson River, and 343 spawning adults per year for the Altamaha River). The Altamaha estimate represent only a fraction of the total population size of this subpopulation as Atlantic sturgeon do not spawn every year. Additionally, neither of these estimates include subadults 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.

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths are rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown. For the years 2006 through 2010, an average of 775 Atlantic sturgeon encounters with small mesh otter trawl gear occurred in all areas (759 in the 600 series of statistical areas).

In an updated analysis, NEFSC was able to use data from the Northeast Fishery Observer Program database to provide updated estimates for the 2006 to 2010 timeframe. For reference, estimated total

annual takes for all gear types (otter trawl and sink gillnet) ranged from 1536 to 3221 (average 2,215). For small-mesh otter trawls, total annual takes from 2006 to 2010 ranged from 394 to 1546 (average 775). Estimated annual mortalities for all gear types ranged from 37 to 376 sturgeon.

It should be noted that other fisheries, such as the small-mesh multispecies (whiting) fishery, utilize the small-mesh otter trawl gear and fish in the same area where MSB species occur. Accordingly, it is likely that actual encounters with Atlantic sturgeon by the MSB fisheries are lower than the totals for the gear type. However, because the Northeast Fishery Observer Program data available for this analysis did not identify the species targeted, a more precise evaluation of encounters in only the MSB fisheries cannot be specified at this time.

A comparison of the location of the MSB fisheries (see Section 6.1) and with the known-preferred habitat of Atlantic sturgeon (shallow inshore areas, primarily less than 50 m), suggests that the portion of 2006-2010 small-mesh otter trawl interactions attributable to MSB fisheries could likely have occurred in the summer/fall inshore longfin squid fishery, which occurs nearshore in waters less than 40 fathoms. The longfin squid quota is allocated in trimesters (43% for Trimester 1; 17% for Trimester 2; 40% for Trimester 3), so roughly half of the quota is available during the summer and fall period. The nearshore effort in the summer and fall longfin squid fishery overlaps with the water depths in which most observed sturgeon encounters occur. This is supported by the Stein et al. (2004a) analysis, which showed sturgeon encounters with the longfin squid and butterfish fisheries during the period from 1989-2000, but showed no encounters with *Illex* squid and mackerel fisheries.

Atlantic sturgeon interactions with small-mesh otter trawl are distributed throughout the year. On average, the most estimated small-mesh otter trawl encounters with Atlantic sturgeon in the 600 series of statistical areas occur during Quarter 2 (April through June), and the fewest occur during Quarter 3 (July – September). However, the contribution of each quarter to total estimated encounters differs from year to year.

Compared to gillnet gear, small-mesh otter trawl gear accounts for relatively few sturgeon mortalities. The number of small-mesh otter trawl takes resulting in mortality remained at less than 5% of total estimated encounters for the entire period, with estimated annual mortalities ranging from 4 to 90 (total mortalities for all gear types ranged from 37 to 376). Between 2006 and 2010, there were no estimated Atlantic sturgeon mortalities in small-mesh otter trawl gear during Quarters 2 and 3, and an average of 11 estimated mortalities in Quarters 1. Estimated Quarter 4 mortalities in small-mesh otter trawl gear only occurred 2006 (61 total estimated mortalities). All mortalities in small-mesh otter trawl gear occurred in the 600 series of statistical areas. It is important to note that the information provided on mortality rates may be an underestimate as the rate of post-release mortality for those reportedly released alive is unknown. An analysis of observer data has suggested that the proportions of these mortalities by DPS are approximately: 11% Gulf of Maine, 49% New York Bight, 14% Chesapeake Bay, 4% Carolina, 20% South Atlantic, and 2% Canada (which are not listed). NMFS is undertaking a biological opinion to determine what fishery restrictions might be necessary for Council fisheries. The Council has established a Sturgeon Advisory Panel to help guide its efforts and will consider appropriate measures once the biological opinion is finalized.

NMFS has reinitiated formal consultation regarding Atlantic sturgeon and the MSB fisheries but also found that the continued operation of these fisheries during the reinitiation period is not likely to jeopardize the continued existence of any Atlantic sturgeon DPS. This is based on the NMFS determination that the number of interactions with Atlantic sturgeon that may occur during this period is

low and will only occur for a short period of time. Thus, this is not expected to increase the risk that the fisheries and associated research are jeopardizing any Atlantic sturgeon DPS.

6.5.6 Description of Candidate Species for Listing Under the ESA

Cusk

Cusk are not expected to be impacted by actions in this amendment, but more information may be found at: http://www.nmfs.noaa.gov/pr/species/fish/cusk.htm.

Alewife and Blueback Herring

On August 5, the Natural Resources Defense Council submitted a petition to NOAA requesting that the agency consider river herrings, alewife and blueback herring, for listing. Within 12 months of receipt of this petition, NOAA is required to make a determination of whether alewife and blueback herring should be listed as endangered or threatened, or not at all.

Both alewife and blueback herring are found in coastal waters and rivers from Canada to North Carolina, although blueback herring's range extends farther south to Florida. Both species are managed by the Atlantic States Marine Fisheries Commission.

Blueback herring and alewife are both now considered candidate species under the Endangered Species Act. NOAA has determined that a petition to list alewife and blueback herring, collectively referred to as river herring, under the Endangered Species Act presents enough scientific and commercial information to merit further review. As a result, the agency will conduct a formal review of river herring population status and trends. A decision regarding whether listing is warranted is due on August 5, 2012.

The Atlantic States Marine Fisheries Commission has been conducting a stock assessment for river herring since 2008, covering over 50 river specific stocks throughout the species U.S. range. This represents a significant effort on behalf of the ASMFC and the coastal states from Maine to Florida. NOAA recognizes this extensive effort to compile the most current information on the status of these stocks throughout their range in the United States and intends to work cooperatively with the ASMFC to utilize this information in the ongoing review of the status of these two keystone species.

NOAA will also consider information contained in the petition, published literature, and other information about the historic and current range of river herring, their physical and biological habitat requirements, population status and trends, and threats. If NOAA determines that a listing is appropriate, the agency will publish a proposed rule and take public comment before publishing a final decision. However, if NOAA determines that that listing these species is not appropriate, the process ends.

6.6 Fishery, Port, and Community Description (Human Communities)

Detailed information about landings, revenues, gear, permits, area fished, recreational catch, etc. for mackerel, *Illex*, butterfish, and longfin squid is described in section 6.6. Detailed information on the Atlantic herring fishery is available in Amendment 5's DEIS, available here: http://www.nefmc.org/herring/index.html. Basic community profiles for all Mid-Atlantic and New-England Ports are available at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/. These profiles generally contain landings information through 2006. The table below provides an update for the importance of mackerel, longfin squid, and Atlantic herring (species most impacted by this Amendment) for all ports where cumulative ex-vessel revenues 2007-2010 totaled more than $50,000 and the proportion of revenues from mackerel, longfin squid, and Atlantic herring combined accounted for at least 5% of all revenues. New Bedford is also included because even though the percentage is small, the value of Atl Herring, Atl Mackerel, and longfin squid is still relatively large (the value of scallops dominates in New Bedford). This identifies the ports most dependent on the fisheries that may be impacted by the actions considered in this document.

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Table 24. MSB Ports

PORTNAME	Total Ex-Vessel Value of All Landings in Port (2007-2010)	Percent of Value from Atl Herring	Percent of Value from Mackerel	Percent of Value from Loligo	Percent of Value from Atl Herring, Mackerel, Loligo Combined
PROSPECT, MAINE	$330,577	92%	0%	0%	92%
NORTH KINGSTOWN, RHODE ISLAND	$42,493,380	4%	14%	27%	45%
ROCKLAND, MAINE	$35,664,669	36%	0%	0%	36%
POINT JUDITH, RHODE ISLAND	$137,980,732	1%	0%	22%	24%
HAMPTON BAYS, NEW YORK	$20,374,542	0%	0%	22%	22%
OTHER BARNSTABLE, MASSACHUSETTS	$6,490,882	0%	0%	22%	22%
SHINNECOCK, NEW YORK	$2,591,042	0%	0%	21%	21%
FALL RIVER, MASSACHUSETTS	$13,294,843	9%	10%	0%	19%
MONTAUK, NEW YORK	$64,864,533	0%	0%	19%	19%
PROSPECT HARBOR, MAINE	$9,405,037	18%	0%	0%	18%
NEW YORK CITY, NEW YORK	$971,180	0%	1%	17%	17%
GREENPORT, NEW YORK	$1,538,865	0%	0%	15%	15%
GLOUCESTER, MASSACHUSETTS	$207,497,454	12%	3%	0%	15%
NIANTIC, CONNECTICUT	$1,006,529	0%	1%	13%	14%
PORTLAND, MAINE	$84,423,991	14%	0%	0%	14%
WOODS HOLE, MASSACHUSETTS	$2,756,724	0%	0%	12%	12%
POINT LOOKOUT, NEW YORK	$10,002,397	0%	0%	11%	11%
EAST HAVEN, CONNECTICUT	$2,562,075	0%	0%	8%	8%
FREEPORT, NEW YORK	$1,637,244	0%	0%	7%	7%
NEWPORT, RHODE ISLAND	$33,081,171	2%	0%	5%	7%
BELFORD, NEW JERSEY	$10,984,338	0%	0%	5%	6%
CAPE MAY, NEW JERSEY	$266,247,723	1%	2%	3%	5%
OTHER NEWPORT, RHODE ISLAND	$794,742	0%	0%	5%	5%
HYANNISPORT, MASSACHUSETTS	$8,718,830	0%	0%	5%	5%
NEW BEDFORD, MASSACHUSETTS	$1,057,316,970	1%	1%	0%	2%

Source: NMFS Dealer Weighout Database Unpublished Data

The Council employed a new procedure for gathering information from its Squid-Mackerel-Butterfish Advisory Panel during the 2012 specifications setting process. The Advisory Panel created a "Fishery Performance Report" for each species based on the advisors' personal and professional industry experiences as well as reactions to an "informational document" for each species created by Council staff. The Fishery Performance Reports, while not reviewed by NMFS technical staff in the same fashion as this environmental assessment, may be of additional interest to the reader and may be found here: http://www.mafmc.org/meeting_materials/SSC/2011-05/SSC_2011-05.htm. The staff informational document, while also not reviewed and containing some preliminary information, was constructed using the same basic analytical techniques as this document and also may be of interest to readers looking for additional descriptive fishery information (available via same link as above).

6.7 Fishery and Socioeconomic Description

6.7.1 Atlantic mackerel (mackerel)

Historical Commercial Fishery

The modern northwest mackerel fishery began with the arrival of the European distant-water fleets in the early 1960's. Total international commercial landings (Northwest Atlantic Fisheries Organization Subareas 2-6,) peaked at 437,000 mt in 1973 and then declined sharply to 77,000 by 1977 (Overholtz 1989). The MSA established control of the portion of the mackerel fishery occurring in U.S. waters (Northwest Atlantic Fisheries Organization Subareas 5-6) under the auspices of the Council. Reported foreign landings in U.S. waters declined from an unregulated level of 385,000 mt in 1972 to less than 400 mt from 1978-1980 under the MSFCMA (the foreign mackerel fishery was restricted by NOAA Foreign Fishing regulations to certain areas or "windows." Under the MSB FMP foreign mackerel catches were permitted to increase gradually to 15,000 mt in 1984 and then to a peak of almost 43,000 mt in 1988 before being phased out again (Figure 42).

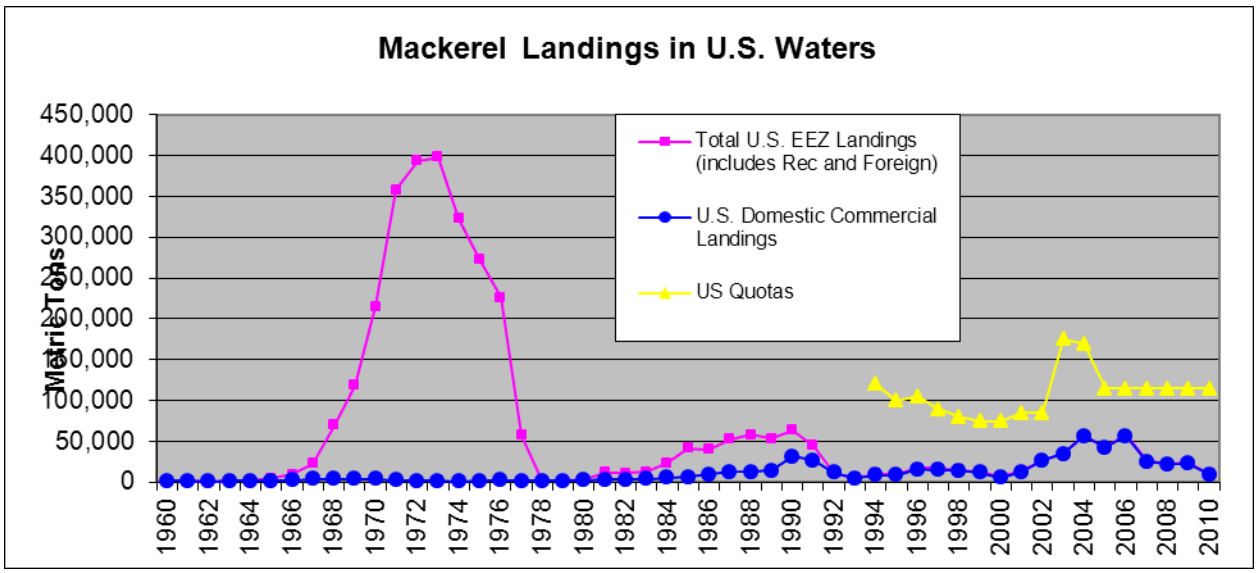

Figure 42. Historical Alt. Mackerel Landings in the U.S. EEZ.

U.S. commercial landings of mackerel increased steadily from roughly 3000 mt in the early 1980s to greater than 31,000 mt by 1990. U.S. mackerel landings declined to relatively low levels 1992-2000 before increasing in the early 2000's. The most recent years have seen a significant drop-off in harvest. Price (nominal) has fluctuated without trend since 1982 and averaged $323/mt in 2010.

Analysis of NMFS weighout data is used to chart annual estimates for U.S. mackerel landings (mt), ex-vessel value ($), and nominal (not inflation adjusted) prices 1982-2010 ($/mt) in the figures below.

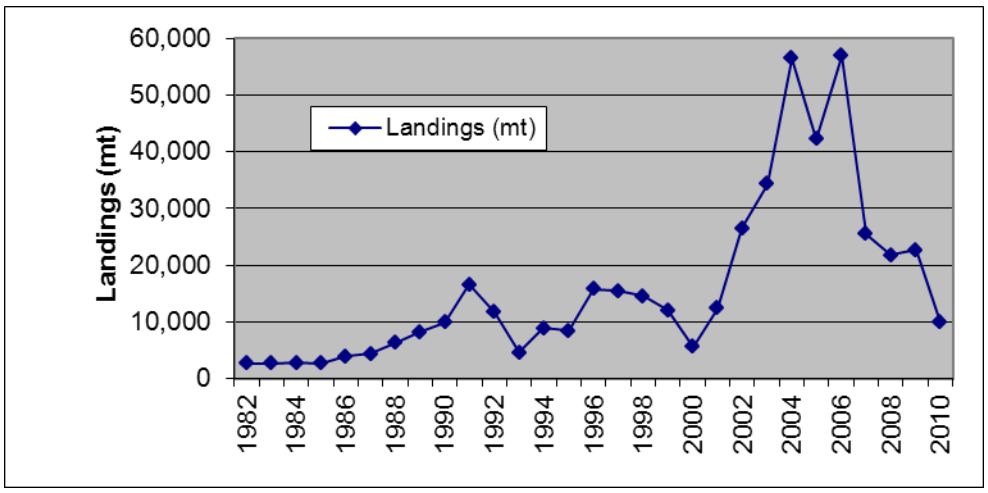

Figure 43. U.S. Mackerel Landings.
Source: Unpublished NMFS dealer reports

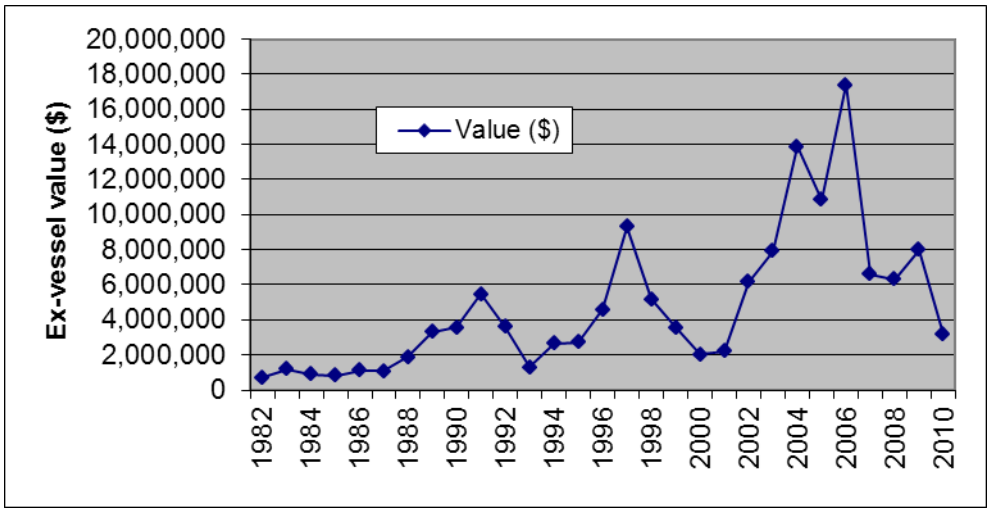

Figure 44. U.S. Mackerel Ex-vessel Revenues.
Source: Unpublished NMFS dealer reports

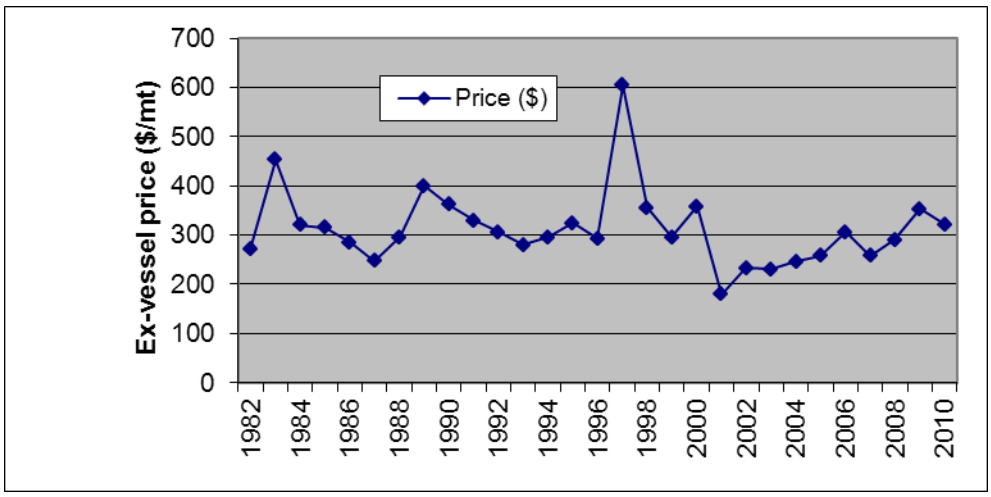

Figure 45. U.S. Mackerel Ex-Vessel Prices.
Source: Unpublished NMFS dealer reports

Specification Performance

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 25 lists the performance of the mackerel fishery (commercial and recreational together) compared to its DAH. There have been no quota overages.

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Table 25. Mackerel DAH Performance. (mt)

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	10,669	115,000	9%

Source: Unpublished NMFS dealer reports

Commercial Fishery and Community Analysis

The following tables describe, for mackerel in 2010, the total landings, value, numbers of vessels making landings, numbers of trips landing mackerel, price per metric ton (Table 26), landings by state (Table 27), landings by month (Table 28), landings by gear (Table 29), numbers of permitted and active vessels by state (Table 30), numbers of uncanceled permits over time (Figure 46), numbers of permitted and active dealers by state (Table 31), and landings by NMFS federal permit category (Table 32). Previous Specification EA's have included port information but because of confidentiality concerns such tables are not able to include much relevant information and have been deleted.

Table 26. 2010 Total Mackerel Landings, Value, Active Vessels, Trips, and Price.

(Based on unpublished NMFS dealer reports. For Vessels and Trips, only landing records with recorded NERO Permits or Hull Numbers landing over 1,000 pounds annually for "Vessels" and 100 pounds on a trip for "Trips" are considered. Since some state records do not include permit/hull information, the vessel and trip numbers are somewhat underestimated but account for the vast majority of landings.)

	Landings (mt)	Value ($)	Vessels	Trips	$/mt
Mackerel	9,891	3,195,962	74	588	$323

Source: Unpublished NMFS dealer reports

Table 27. Mackerel Landings (mt) by State in 2010.

State	Landings (mt)	Pct_of_Total
Massachusetts	5,514	56%
New Jersey	2,128	22%
Rhode Island	1,976	20%
Maine	161	2%
New York	51	1%
Connecticut	31	0%
North Carolina	21	0%
Virginia	9	0%
Maryland	0	0%
New Hampshire	0	0%
Total	9,891	100%

Source: Unpublished NMFS dealer reports

Table 28. Mackerel Landings (mt) by Month in 2010.

MONTH	Landings (mt)	Pct of Total
January	5,635	57%
February	2,655	27%
March	1,188	12%
April	165	2%
May	105	1%
June	57	1%
July	10	0%
August	4	0%
September	6	0%
October	54	1%
November	2	0%
December	10	0%
Total	9,891	100%

Source: Unpublished NMFS dealer reports

Table 29. Mackerel Landings (mt) by Gear Category in 2010.

GEAR_NAME	Landings (mt)	Pct of Total
TRAWL,OTTER,MIDWATER PAIRED	4,149	42%
TRAWL,OTTER,BOTTOM,FISH	2,744	28%
TRAWL,OTTER,MIDWATER	1,992	20%
Other	1,006	10%
Total	9,891	100%

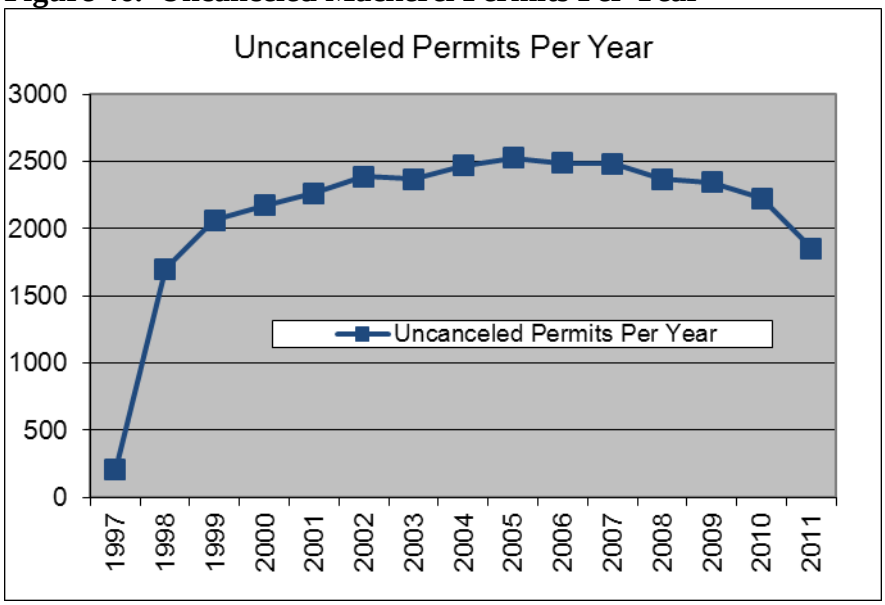
Source: Unpublished NMFS dealer reports

Table 30. Mackerel Vessel Permit Holders and Active Permit Holders in 2010 by Homeport State (HPST).

HPST	Permitted Vessels	Active Vessels
MA	891	52
NJ	294	37
ME	253	5
NY	230	34
RI	142	41
NH	95	11
VA	94	6
NC	91	10
CT	37	6
MD	30	2
Other	44	2
Total	2201	206

Source: unpublished NMFS permit and dealer data.

Figure 46. Uncanceled Mackerel Permits Per Year



Source: Unpublished NMFS dealer reports

Table 31. Mackerel, Squid, and Butterfish Dealer Permit Holders and Those that Made Mackerel Purchases in 2010 by State.

State	Permitted Dealers	Active Dealers
MA	109	27
NY	87	17
RI	39	12
NC	24	9
ME	19	7
VA	17	5
NJ	39	4
NH	8	3
CT	6	2
MD	8	2
Other	10	0
Total	366	88

Source: unpublished NMFS permit and dealer reports.

Table 32. Mackerel Landings by Permit Category for the Period 2001-2010.

Year	Atlantic Mackerel Permit		Party/Charter		No Permit/ Unknown		Total	
	mt	%	mt	%	mt	%	mt	Quota
2001	12,063	98%	0	0%	277	2%	12,340	85,000
2002	25,887	98%	0	0%	643	2%	26,530	85,000
2003	33,969	99%	0	0%	329	1%	34,298	175,000
2004	56,100	99%	0	0%	339	1%	56,439	170,000
2005	42,122	100%	0	0%	148	0%	42,270	115,000
2006	56,705	100%	0	0%	155	0%	56,860	115,000
2007	24,898	97%	0	0%	649	3%	25,546	115,000
2008	21,312	98%	0	0%	422	2%	21,734	115,000
2009	22,508	99%	0	0%	127	1%	22,635	115,000
2010	9,769	99%	0	0%	122	1%	9,891	115,000

Source: unpublished NMFS permit and dealer reports.

Description of Areas Fished in VTR Reports

Vessel Trip Reports (VTRs) represent captains' estimates of kept weight of fish/squid. VTR reports, which are a subset of the landings data, provide the approximate location of kept fish/squid. VTR reports for mackerel in 2010 by NMFS three digit statistical area (see Figure 47) are given in Table 33.

Table 33. Statistical Areas from Which 1% or More of Mackerel Were Kept in 2010 According to VTR Reports.

Stat Area	Landings (mt)	Percentage from Area
612	5759.73	59%
622	1260.21	13%
621	1130.75	12%
615	399.21	4%
616	383.22	4%
613	292.74	3%
625	118.25	1%

Source: Unpublished NMFS VTR reports.

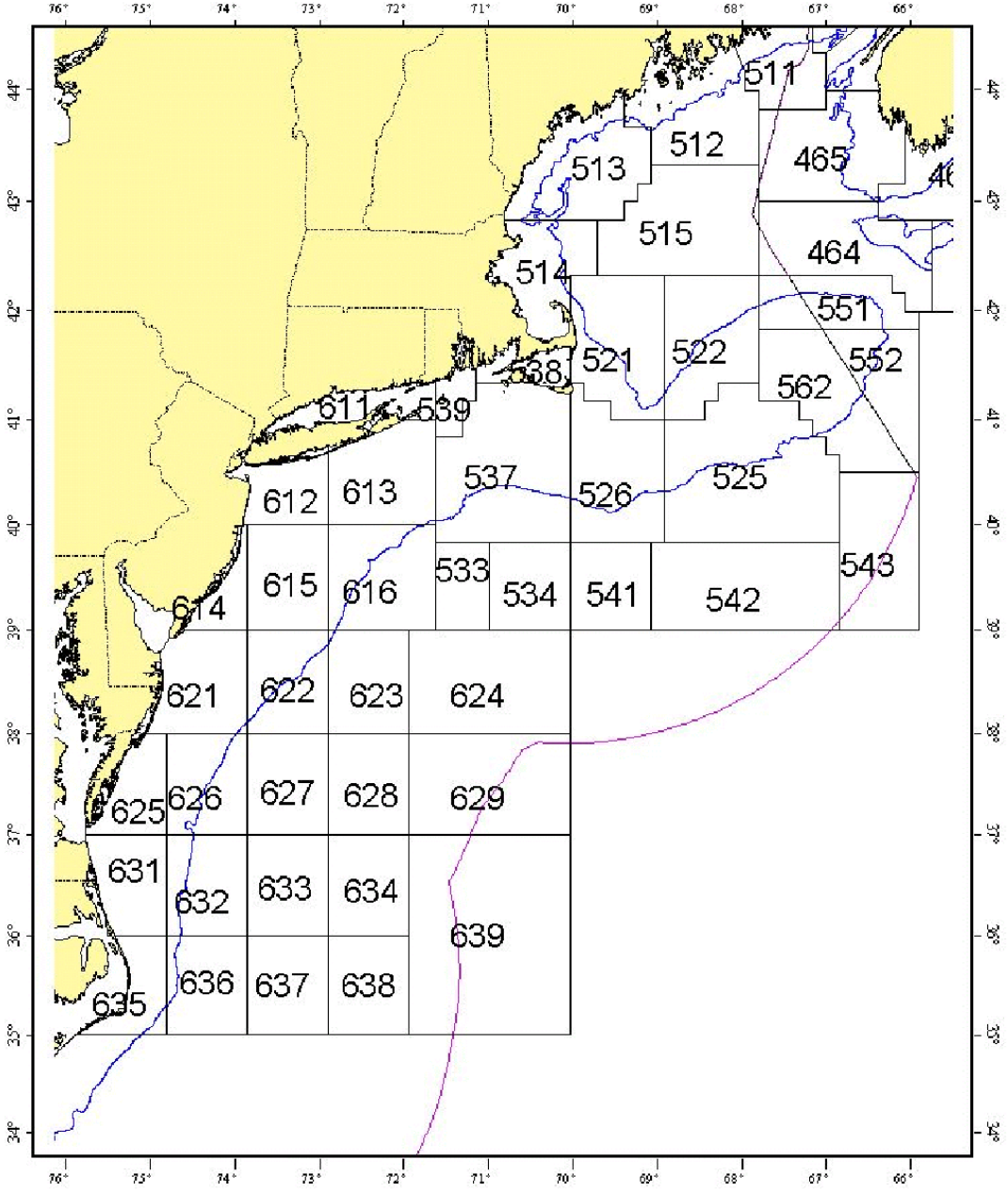


Figure 47. NMFS Statistical Areas

Current Market Overview for Mackerel

The Management Plan for mackerel, squid, and butterfish Fisheries requires that specific evaluations be made in the specification setting process before harvest rights are granted to foreign interests in the form of foreign fishing or joint venture allocations. The Council has concluded in recent years that conditions in the world market for mackerel have changed only slightly from year to year.

World Production and Prices

According to the U.N. Food and Agriculture Organization, world landings of mackerel dramatically increased in the 1960s, peaked at 1,092,759 mt in 1975, and have been between 550,000 mt and 850,000 mt since 1977. (Figure 48) (http://www.fao.org/fishery/statistics/). Prices for imported and exported U.S. mackerel, likely good indications of prices on the world market, averaged $1,118 per mt in 2010 for exports and 3,204 per mt in 2010 for imports (NMFS 2010; *http://www.st.nmfs.noaa.gov/st1/trade/documents/TRADE2010.pdf*).

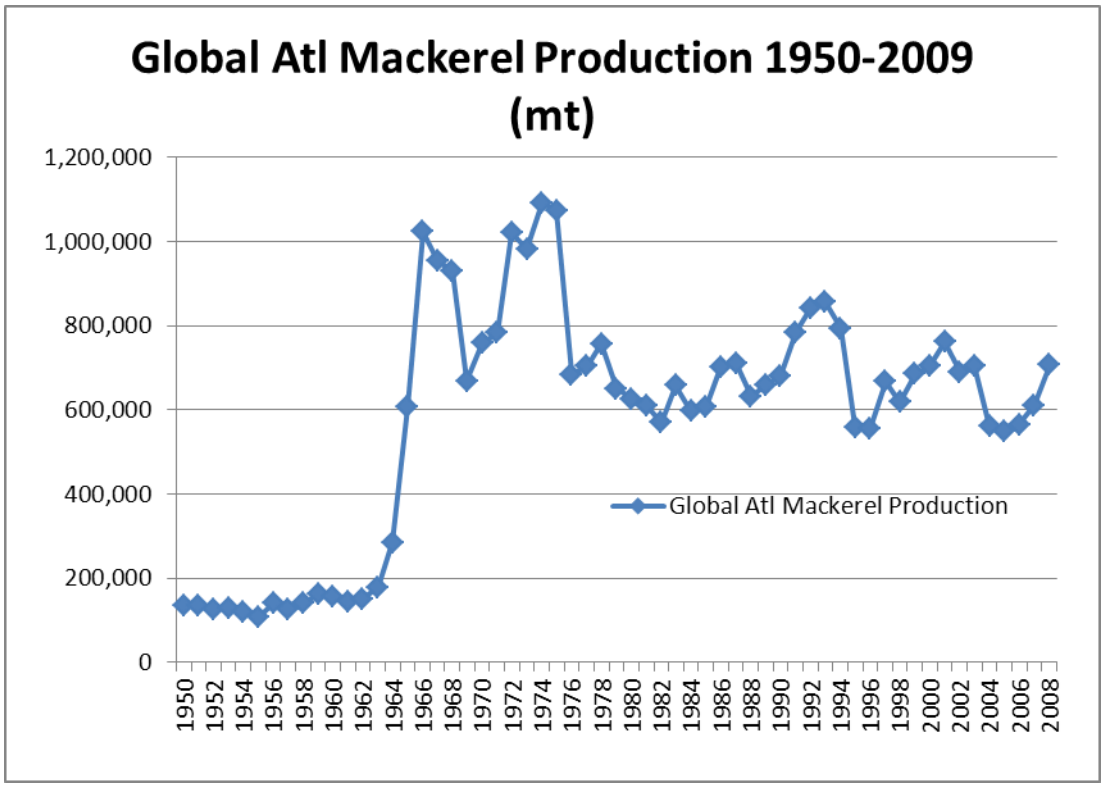


Figure 48. World production of Mackerel, 1950-2008 based on U.N. Food and Agriculture Organization (2010).

Future Supplies of and Demand for Mackerel

Mackerel produced in the U.S. is a substitute for European produced mackerel. The quantity of European mackerel supplied to the market declined in 2006 and 2007 [Chetrick 2006: http://www.fas.usda.gov/info/fasworldwide/2006/10-2006/EUMackerel.pdf]. As a result, the quantity of U.S. mackerel demanded increased. In addition to the price of European mackerel, there are many factors which affect the worldwide demand for mackerel, including income, tastes, and the price of substitute goods. There has also been controversy in 2011 regarding high levels of mackerel fishing by Iceland and the Faroe Islands in areas that have not recently produced mackerel.

U.S. Exports of Mackerel

In 2010, U.S. exports of all mackerel products (fresh, frozen, and prepared/preserved) totaled 10,340 mt, valued at $11.6 million.

Recreational Fishery

Mackerel are seasonally important to the recreational fisheries of the Mid-Atlantic and New England regions. They may be available to recreational anglers in the Mid-Atlantic primarily during the spring migration although this fishery has not been as robust in recent years. Historically, mackerel first appear off Virginia in March and gradually move northward. Christensen *et al.* 1979 found mackerel to be available to the recreational fishery from Delaware to New York for about three weeks (generally from early April to early May). As a result, the annual recreational catch of mackerel appears to be sensitive to changes in their migration and subsequent distribution pattern (Overholtz *et al.* 1989).

Recreational landings of mackerel for the last 10 years (since 2001), as estimated from the NMFS Marine Recreational Fishery Statistics Survey, are given in Table 34 and Table 35. In recent years, recreational mackerel harvest has varied from roughly 1,633 mt in 1997 to 530 in 2004. The highest landings occur from Massachusetts to Maine. Most mackerel are taken from boats. Also, over the same time period approximately 10% of all mackerel caught (by number) were released.

Estimates for mackerel recreational harvest are relatively uncertain due to low encounter rates. From 2001-2010 annual estimates had an average Proportional Standard Error (PSE) of 16%. Based on how PSEs are calculated, this means that on average we were approximately 95% sure that the real number for weight of mackerel harvest was within 32% (+ or -) of our estimate (best was ± 20%, worst was ± 47%). Breakouts by state or mode would have greater uncertainty. In addition, the uncertainty is even higher in reality because of sampling problems with Marine Recreational Fisheries Statistical Survey. The Marine Recreational Information Program (MRIP) is trying to figure out by just how much and to implement improved procedures – see countmyfish.noaa.gov. MRIP will be generating new less-biased estimates soon but they were not available at the time this document was developed.

Table 34. Recreational Harvest (rounded to nearest metric ton) of Mackerel by State, 2001-2010.

Year	ME	MD	MA	NH	NJ	NY	NC	RI	VA	DE	CT	Annual Total
2001	287	22	885	224	78	18	0	7	2	13	0	1,536
2002	387	2	728	65	60	0	0	47	0	3	1	1,294
2003	123	0	510	79	29	19	0	8	1	0	0	770
2004	207	0	291	27	2	0	0	0	0	3	0	530
2005	181	0	768	74	10	0	0	0	0	0	0	1,033
2006	109	0	1,488	31	0	0	0	1	0	0	3	1,633
2007	280	0	561	43	0	0	0	0	0	0	0	884
2008	148	0	413	129	0	0	0	0	0	0	0	691
2009	320	0	155	272	0	0	0	0	0	0	0	747
2010	250	0	465	62	0	0	0	0	0	0	0	778

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division.

Table 35. Recreational Harvest (rounded to nearest metric ton) of Mackerel by Mode and Total, 2000-2010.

Year	PARTY-CHARTER	PRIVATE or RENTAL	SHORE	Annual Total
2001	164	1,290	82	1,536
2002	23	1,172	98	1,294
2003	53	594	123	770
2004	21	395	115	530
2005	25	994	14	1,033
2006	11	1,560	62	1,633
2007	20	801	63	884
2008	9	646	35	691
2009	171	435	141	747
2010	26	610	142	778

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division.

6.7.2 *Illex illecebrosus*

Historical Commercial Fishery

Foreign fishing fleets became interested in exploitation of the neritic squid stocks of the Northwest Atlantic Ocean when the Union of Soviet Socialist Republics first reported squid catches in the mid-1960's. By 1972, foreign fishing fleets reported landing 17,200 thousand mt of *Illex* from Cape Hatteras to the Gulf of Maine (Figure 49). During the period 1973-1982, foreign landings of *Illex* in U.S. waters averaged about 18,000 mt, while U.S. fisherman averaged only slightly more than 1,100 mt per year. Foreign landings from 1983-1986 were part of the U.S. joint venture fishery which ended in 1987 (NMFS 1994a). The domestic fishery for *Illex* increased fitfully during the 1980's as foreign fishing was eliminated in the U.S. EEZ. *Illex* landings are heavily influenced by year-to-year availability and world-market activity. Price (nominal) has increased fitfully since 1982 and averaged $525/mt in 2010.

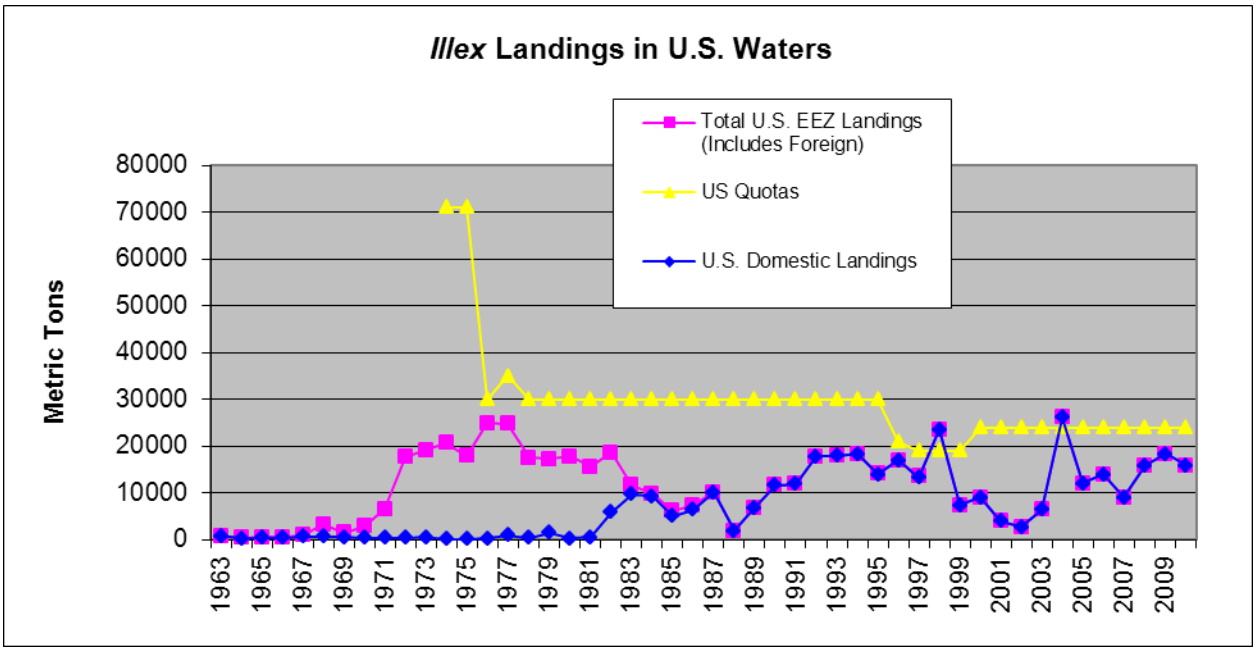


Figure 49. Historical *Illex* Landings in the U.S. EEZ.

Analysis of NMFS dealer weighout data 1982-2010 is used to chart annual averages for U.S. landings (mt), ex-vessel value ($), and nominal prices ($/mt) in the figures below.

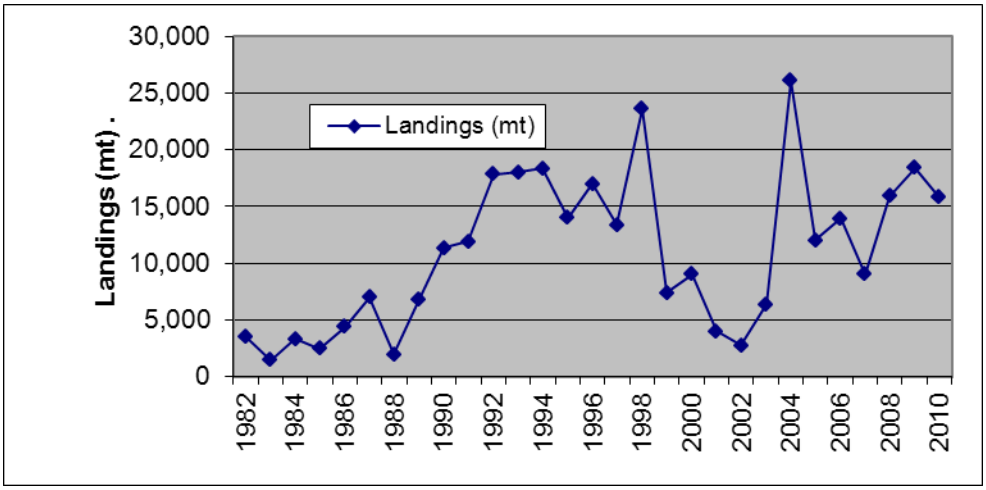


Figure 50. U.S. *Illex* Landings.
Source: Unpublished NMFS dealer reports

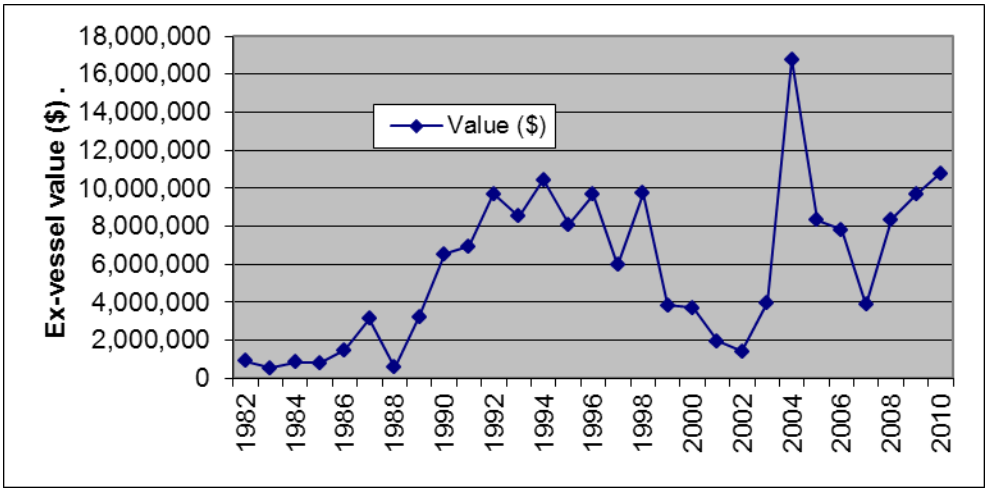


Figure 51. U.S. *Illex* Ex-vessel Revenues.
Source: Unpublished NMFS dealer reports

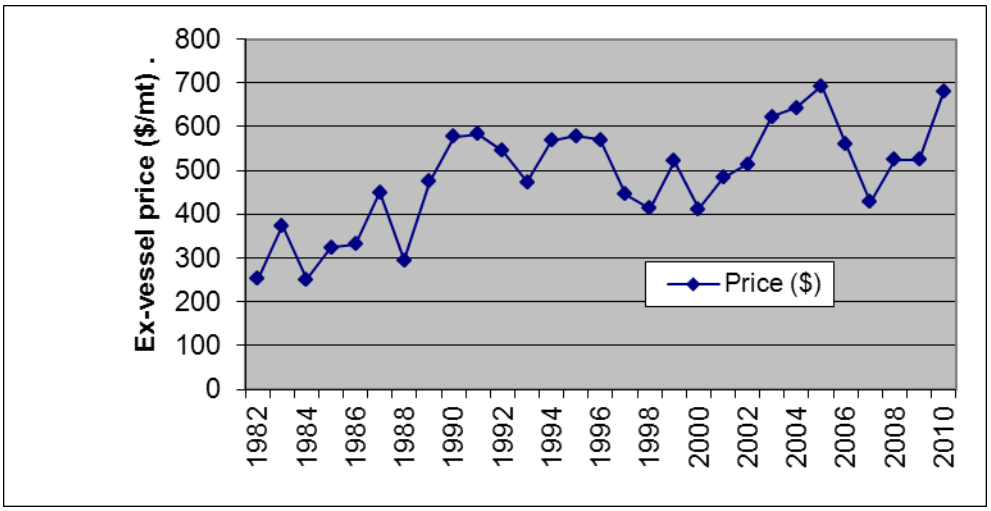


Figure 52. U.S. *Illex* Ex-vessel Prices.
Source: Unpublished NMFS dealer reports

Specification Performance

The principle measure used to manage *Illex* 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 95% of the DAH is landed. Mandatory reporting for *Illex* was fully instituted in 1997 so specification performance since 1997 is most relevant. Table 36 lists the performance of the *Illex* fishery compared to its DAH. There was an overage in 1 of the last 10 years (a 9% overage in 2004) and 2 of the last 12 years (the 9% overage and a 24% overage in 1998). NMFS is continually augmenting its projecting procedures so presumably future overages would be even less likely.

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Table 36. *Illex* DAH Performance. (mt)

Year	Landings	Quota	Percent of Quota Landed
1997	13,629	19,000	72%
1998	23,597	19,000	124%
1999	7,388	19,000	39%
2000	9,011	24,000	38%
2001	4,009	24,000	17%
2002	2,750	24,000	11%
2003	6,389	24,000	27%
2004	26,097	24,000	109%
2005	12,011	24,000	50%
2006	13,944	24,000	58%
2007	9,022	24,000	38%
2008	15,900	24,000	66%
2009	18,418	24,000	77%
2010	15,825	24,000	66%

Source: Unpublished NMFS dealer reports

Commercial Fishery and Community Analysis

The following tables describe, for *Illex* in 2010, the total landings, value, numbers of vessels making landings, numbers of trips landing *Illex* (Table 37), landings by state (Table 38), landings by month (Table 39), landings by gear (Table 40), numbers of permitted and active vessels by state (Table 41), numbers of permitted and active dealers by state (Table 42), and landings by NMFS federal permit category (Table 43). Previous Specification EA's have included port information but because of confidentiality concerns such tables are not able to include much relevant information and have been deleted.

Table 37. Total Landings and Value of *Illex* During 2010.
(Based on unpublished NMFS dealer reports. For Vessels and Trips, only landing records with recorded NERO Permits or Hull Numbers landing over 1,000 pounds annually for "Vessels" and 100 pounds on a trip for "Trips" are considered. Since some state records do not include permit/hull information, the vessel and trip numbers are somewhat underestimated but account for the vast majority of landings.)

	Landings (mt)	Value ($)	Vessels	Trips	$/mt
Illex	15,825	10,758,235	24	248	$680

Source: Unpublished NMFS dealer reports

Table 38. *Illex* Landings (mt) by State in 2010.

State	Landings_mt	Pct_of_Total
New Jersey	9,224	58%
Rhode Island	5,639	36%
North Carolina	521	3%
Virginia	435	3%
Other	5	0%
Total	15,825	100%

Source: Unpublished NMFS dealer reports

Table 39. *Illex* Squid Landings (mt) by Month in 2010.

MONTH	Landings (mt)	Pct of Total
January	1	0%
February	0	0%
March	0	0%
April	0	0%
May	264	2%
June	4,841	31%
July	6,164	39%
August	3,597	23%
September	620	4%
October	275	2%
November	22	0%
December	40	0%
Total	15,825	100%

Source: Unpublished NMFS dealer reports

Table 40. *Illex* Landings (mt) by Gear Category in 2010.

GEAR_NAME	Landings (mt)	Pct of Total
TRAWL,OTTER,BOTTOM,FISH	11,066	70%
TRAWL,OTTER,MIDWATER	4,232	27%
TRAWL,OTTER,BOTTOM,OTHER	520	3%
Other	7	0%
Total	15,825	100%

Source: Unpublished NMFS vessel trip reports

Table 41. *Illex* Moratorium Vessel Permit Holders and Active Vessels in 2010 by Homeport State (HPST).

HPST	Permitted Vessels	Active Vessels
NJ	28	11
MA	12	3
RI	11	6
NC	7	5
NY	6	1
Other	12	0
Total	76	26

Source: Unpublished NMFS dealer reports.

Table 42. Mackerel, Squid, Butterfish Dealer Permit Holders and Permitted Dealers Who Bought *Illex* in 2010 by State.

State	Permitted Dealers	Active Dealers
NC+VA	41	12
MA	109	6
RI	39	5
NY+NJ	126	6
Others	51	0

Source: Unpublished NMFS dealer reports

Table 43. *Illex* Landings by Permit Category for the Period 2000-2010.

Year	Illex Moratorium Permit		Party/ Charter		Incidental		No Permit/ Unknown		Total	
	mt	%	mt	%	mt	%	mt	%	mt	Quota
2001	3,922	98%	0	0%	0	0%	86	2%	4,009	24,000
2002	2,743	100%	0	0%	2	0%	5	0%	2,750	24,000
2003	6,389	100%	0	0%	0	0%	2	0%	6,391	24,000
2004	25,046	99%	0	0%	140	1%	237	1%	25,422	24,000
2005	11,146	95%	0	0%	23	0%	548	5%	11,717	24,000
2006	13,778	100%	0	0%	52	0%	7	0%	13,837	24,000
2007	9,019	100%	0	0%	1	0%	2	0%	9,022	24,000
2008	15,863	100%	0	0%	1	0%	36	0%	15,900	24,000
2009	18,409	100%	0	0%	9	0%	0	0%	18,419	24,000
2010	15,818	100%	0	0%	1	0%	6	0%	15,825	24,000

Source: Unpublished NMFS dealer reports

Description of the Areas Fished in VTR Reports

Vessel Trip Reports (VTRs) represent captains' estimates of kept weight of fish/squid. VTR reports, which are a subset of the landings data, provide the approximate location of kept fish/squid. VTR reports for *Illex* in 2010 by NMFS three digit statistical area (see Figure 47) are given in Table 44.

Table 44. Statistical Areas from Which 1% or More of *Illex* Were Kept in 2010 According to VTR Reports.

Stat Area	Landings (mt)	Percentage from Area
622	10444.06	68%
632	1748.89	11%
626	1187.52	8%
628	752.52	5%
537	393.77	3%
616	325.39	2%
615	171.91	1%

Source: Unpublished NMFS VTR reports.

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6.7.3 Atlantic butterfish

Historical Commercial Fishery

Atlantic butterfish were landed exclusively by U.S. fishermen from the late 1800's (when formal record keeping began) until 1962 (Murawski and Waring 1979). Reported landings averaged about 3,000 mt from 1920-1962 (Waring 1975). Beginning in 1963, vessels from Japan, Poland and the Union of Soviet Socialist Republics began to exploit butterfish along the edge of the continental shelf during the late-autumn through early spring. Reported foreign catches of butterfish increased from 750 mt in 1965 to 15,000 mt in 1969, and then to about 32,000 mt in 1973. With the advent of extended jurisdiction in U.S. waters, reported foreign catches declined sharply from 14,000 mt in 1976 to 2,000 mt in 1978 (Figure 53). Foreign landings were completely phased out by 1987.

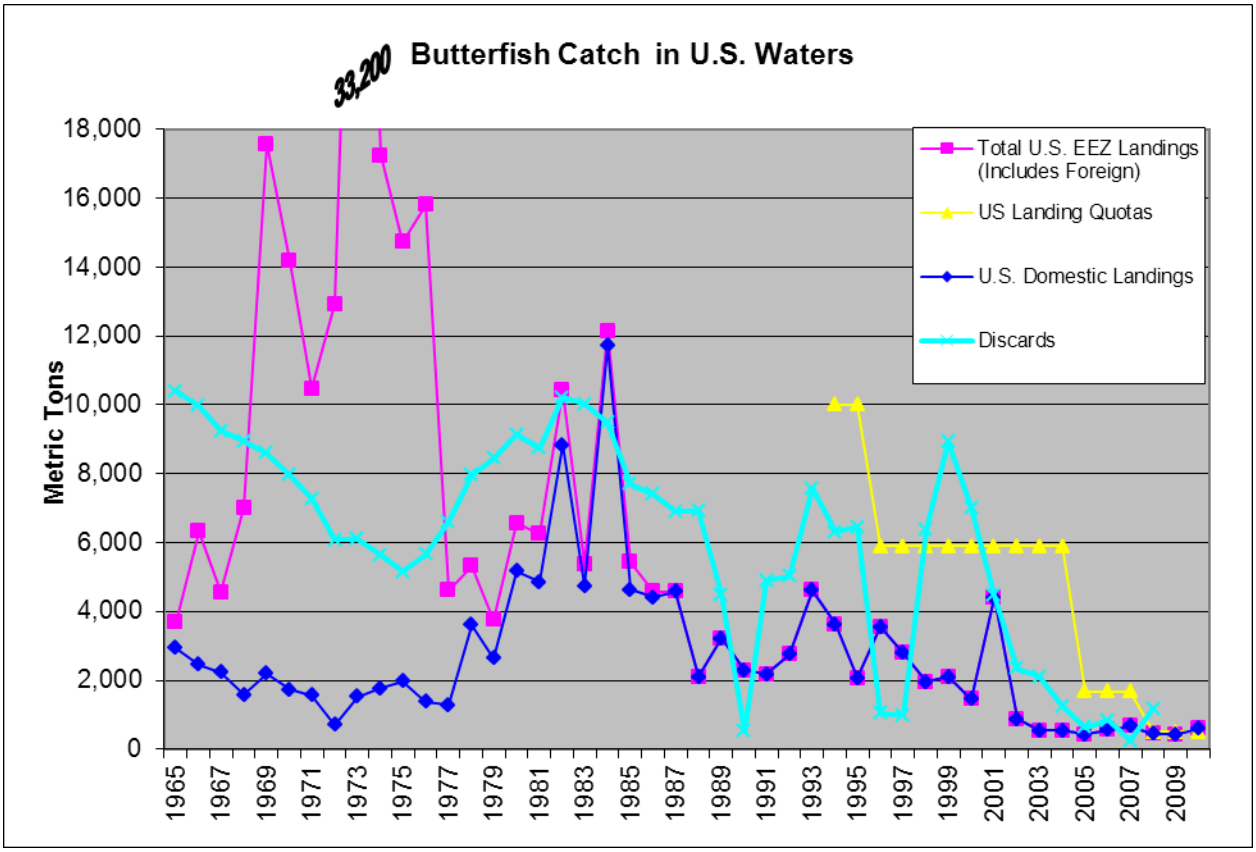

Figure 53. Historical Butterfish Landings in the U.S. EEZ.

During the period 1965-1976, U.S. Atlantic butterfish landings averaged 2,051 mt. From 1977-1987, average U.S. landings doubled to 5,252 mt, with a historical peak of slightly less than 12,000 mt landed in 1984. Since then U.S. landings have declined sharply. Low abundance and reductions in Japanese demand for butterfish has probably had a negative effect on butterfish landings. Price (nominal) has increased fitfully since 1982 and averaged $1,404/mt in 2010.

Analysis of NMFS weighout data 1982-2010 is used to chart annual averages for U.S. landings (mt), ex-vessel value ($), and prices ($/mt) in the figures below.

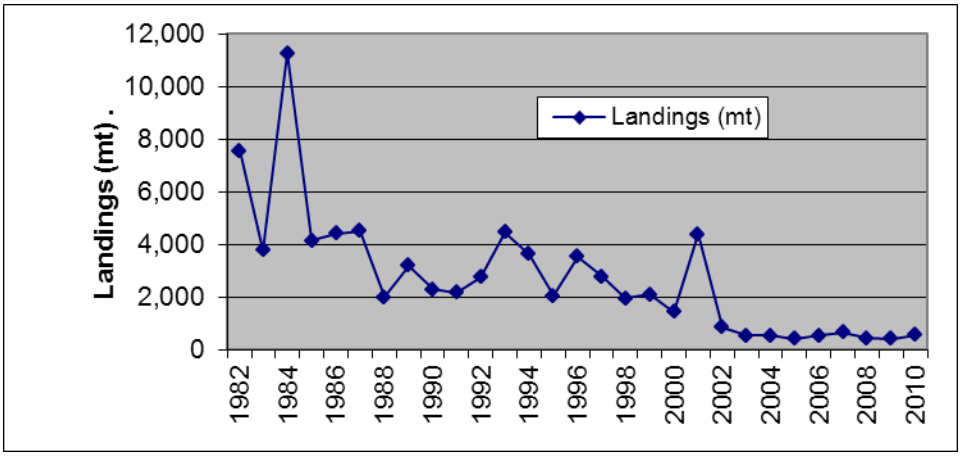

Figure 54. U.S. Butterfish Landings.
Source: Unpublished NMFS dealer reports

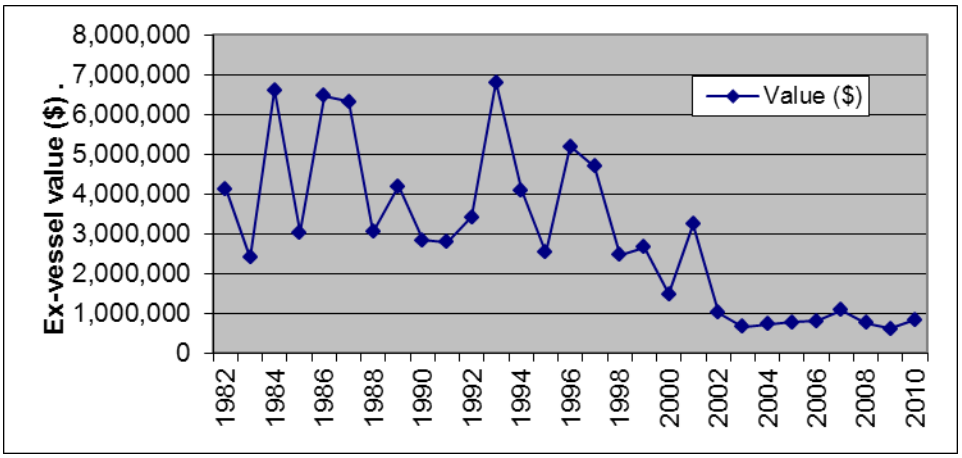

Figure 55. U.S. Butterfish Ex-vessel Revenues.
Source: Unpublished NMFS dealer reports

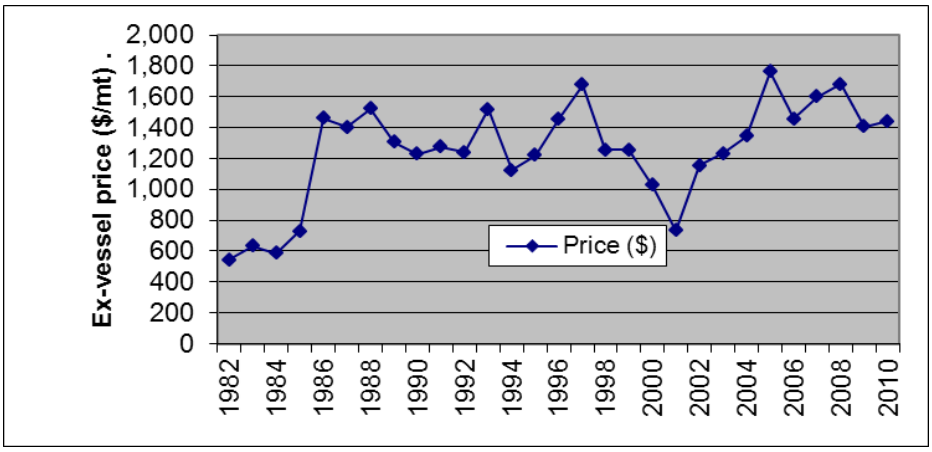

Figure 56. U.S. Butterfish Ex-vessel Prices.
Source: Unpublished NMFS dealer reports

Specification Performance

The principle measure used to manage butterfish landings 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 80% of the DAH is landed. Mandatory reporting for butterfish was fully instituted in 1997 so performance since 1997 is most relevant. Table 45 lists the performance of the butterfish fishery compared to its DAH. There had been no overages before 2010. There were closures in 2008 and 2009 but the closure threshold and the trip limits performed as designed and prevented an overage. It is unclear why there was an overage in 2010 but prospects for 2012 are discussed in the impacts section.

Table 45. Butterfish DAH Performance (mt)

Year	Harvest (only commercial)	Quota	Percent of Quota Landed
1997	2,795	5,900	47%
1998	1,966	5,900	33%
1999	2,110	5,900	36%
2000	1,449	5,900	25%
2001	4,404	5,897	75%
2002	872	5,900	15%
2003	536	5,900	9%
2004	537	5,900	9%
2005	428	1,681	25%
2006	554	1,681	33%
2007	678	1,681	40%
2008	451	500	90%
2009	435	500	87%
2010	603	500	121%

Source: Unpublished NMFS dealer reports

Commercial Fishery and Community Analysis

The following tables describe, for butterfish in 2010, the total landings, value, numbers of vessels making landings, numbers of trips landing butterfish (Table 46), landings by state (Table 47), landings by month (Table 48), landings by gear (Table 49), landings by port (Table 50), numbers of permitted vessels by state (Table 51), numbers of permitted dealers by state (Table 52), and landings by NMFS federal permit category (Table 53). Previous Specification EA's have included additional port information (dependence) but because of confidentiality concerns such tables are not able to include much relevant information and have been deleted.

Table 46. Total Landings and Value of Butterfish During 2010.
(Based on unpublished NMFS dealer reports. For Vessels and Trips, only landing records with recorded NERO Permits or Hull Numbers landing over 1,000 pounds annually for "Vessels" and 100 pounds on a trip for "Trips" are considered. Since some state records do not include permit/hull information, the vessel and trip numbers are somewhat underestimated but account for the vast majority of landings.)

	Landings (mt)	Value ($)	Vessels	Trips	$/mt
Butterfish	603	865,703	131	2,567	$1,435

Source: Unpublished NMFS dealer reports

Table 47. Butterfish Landings (mt) by State in 2010.

State	Landings_mt	Pct_of_Total
Rhode Island	254	42%
New York	184	30%
Massachusetts	79	13%
Connecticut	31	10%
New Jersey	20	3%
Virginia	5	1%
New Hampshire	2	0%
Maryland	1	0%
Delaware	0	0%
Maine	0	0%
Total	576	100%

Source: Unpublished NMFS dealer reports.

Table 48. Butterfish Landings (mt) by Month in 2010.

MONTH	Landings mt	Pct of Total
January	34	6%
February	19	3%
March	25	4%
April	49	8%
May	84	14%
June	94	16%
July	66	11%
August	74	12%
September	44	7%
October	58	10%
November	39	6%
December	19	3%
Total	603	100%

Source: Unpublished NMFS dealer reports

Table 49. Butterfish Landings (mt) by Gear Category in 2010.

GEAR_NAME	Landings (mt)	Pct of Total
TRAWL,OTTER,BOTTOM,FISH	408	68%
UNKNOWN	119	20%
Other	76	13%
Total	603	100%

Source: Unpublished NMFS dealer data.

Table 50. Butterfish Landings by Port in 2010.

name	ST_Name	Landings_mt	Pct_of_Total
POINT JUDITH	RHODE ISLAND	190	31%
MONTAUK	NEW YORK	131	22%
NEW BEDFORD	MASSACHUSETTS	54	9%
STONINGTON	CONNECTICUT	23	7%
NEWPORT	RHODE ISLAND	32	5%
LITTLE COMPTON	RHODE ISLAND	28	5%
HAMPTON BAYS	NEW YORK	24	4%
AMAGANSETT	NEW YORK	11	2%
Other	Various	90	15%
Total	Total	583	100%

Source: Unpublished NMFS dealer reports

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Table 51. Longfin Squid/Butterfish Moratorium Vessel Permit Holders in 2010 by Homeport State (HPST) and How Many of Those Vessels Were Active.

HPST	Permitted Vessels	Active Vessels
MA	96	16
NJ	84	31
NY	54	39
RI	51	44
NC	22	4
ME	17	.
VA	13	.
CT	7	5
MD	2	2
NH	2	.
PA	2	.
WV	1	1
Total	351	142

Source: Unpublished NMFS dealer reports and NMFS permit database data

Table 52. Mackerel, Squid, Butterfish Dealer Permit Holders and How Many Were Active (bought butterfish) in 2010 by State.

State	Permitted Dealers	Active Dealers
NY	87	32
RI	39	17
MA	109	12
VA	17	7
NJ	39	6
Others	75	5

Source: Unpublished NMFS dealer reports and NMFS permit database data

Table 53. Butterfish Landings by Permit Category for the Period 2001-2010.

Year	Loligo/Butterfish Moratorium Permit		Party/Charter		Incidental		No Permit/ Unknown		Total	
	mt	%	mt	%	mt	%	mt	%	mt	Quota
2001	3,991	91%	0	0%	52	1%	360	8%	4,403	5,900
2002	653	75%	0	0%	39	4%	180	21%	872	5,897
2003	367	69%	0	0%	17	3%	151	28%	536	5,900
2004	329	61%	0	0%	22	4%	186	35%	537	5,900
2005	265	62%	0	0%	13	3%	150	35%	428	5,900
2006	386	70%	0	0%	36	7%	131	24%	554	1,681
2007	535	79%	0	0%	43	6%	99	15%	678	1,681
2008	350	78%	0	0%	32	7%	69	15%	451	500
2009	345	79%	0	0%	41	9%	49	11%	435	500
2010	454	75%	0	0%	67	11%	82	14%	602	500

Source: Unpublished NMFS dealer reports and NMFS permit database data

Description of the Areas Fished in VTR Reports

Vessel Trip Reports (VTRs) represent captains' estimates of kept weight of fish/squid. VTR reports, which are a subset of the landings data, provide the approximate location of kept fish/squid. VTR reports for butterfish in 2010 by NMFS three digit statistical area (see Figure 47 except as noted in table below) are given in Table 54.

Table 54. Statistical Areas from Which 1% or More of Butterfish were Kept in 2010 According to VTR Reports.

Stat Area	Landings (mt)	Percentage from Area
537	126.917	26%
539	65.393	13%
611	54.078	11%
616	36.06	7%
613	28.928	6%
562	27.249	6%
525	25.546	5%
522	20.464	4%
148	16.927	3%
612	12.249	2%
514	11.496	2%
538	10.073	2%
622	6.35	1%
166	5.659	1%
121	5.302	1%

Source: Unpublished NMFS VTR reports

6.7.4 Longfin Squid

Historical Commercial Fishery

United States fishermen have been landing squid along the Northeastern coast of the U.S. since the 1880's (Kolator and Long 1978). The early domestic fishery utilized fish traps and otter trawls but was of relatively minor importance to the U.S. fishery due to low market demand. The squid taken were used primarily for bait (Lux et al. 1974). However, squid have long been a popular food fish in various foreign markets and therefore a target of the foreign fishing fleets throughout the world, including both coasts of North America (Okutani 1977). Union of Soviet Socialist Republics vessels first reported catches of squid off the Northeastern coast of the United States in 1964. Fishing effort directed at the squids began in 1968 by the Union of Soviet Socialist Republics and Japanese vessels. By 1972, Spain, Portugal and Poland had also entered the fishery. Reported foreign landings of longfin squid increased from 2000 mt in 1964 to a peak of 36,500 mt in 1973. Foreign longfin squid landings averaged 29,000 mt for the period 1972-1975 (Figure 57).

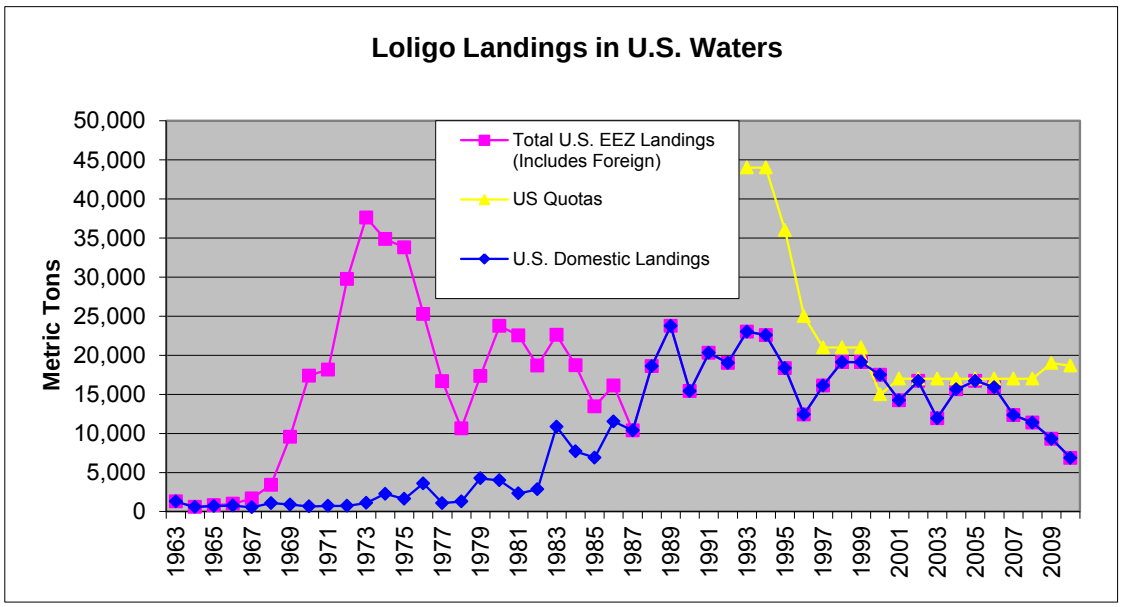

Figure 57. Historical Longfin Squid Landings in the U.S. EEZ.

Foreign fishing for longfin squid began to be regulated with the advent of extended fishery jurisdiction in the U.S. in 1977. Initially, U.S. regulations restricted foreign vessels fishing for squid (and other species) to certain areas and times (the so-called foreign fishing "windows"), primarily to reduce spatial conflicts with domestic fixed gear fishermen and minimize discards of non-target species. The result of these restrictions was an immediate reduction in the foreign catch of longfin squid from 21,000 mt in 1976 to 9,355 mt in 1978.

By 1982, foreign longfin squid landings had again risen above 20,000 mt. At this time, U.S. management of the squid resources focused on the Americanization of these fisheries. This process began with the development of joint ventures between U.S. fishermen and foreign

concerns. Domestic annual harvest (DAH) was increased from 7,000 mt in the 1982-83 fishing year to 22,000 mt for 1983-84. Foreign allocations were reduced from 20,350 mt during 1982-83 to 5,550 mt during 1983-84 (Lange 1985). The foreign catch of longfin squid fell below 5,000 mt by 1986, to 2 mt in 1987 and finally to zero in 1990. Price (nominal) has increased fitfully since 1982 and averaged $1,968/mt in 2010.

The development and expansion of the U.S. squid fishery was slow to occur for several reasons. First, the domestic market demand for squid in the U.S. had traditionally been limited to the bait market. Secondly, the U.S. fishing industry lacked both the catching and processing technology necessary to exploit squid in offshore waters. In the late 19th and early 20th centuries, squid were taken primarily by pound nets. Even though bottom otter trawls eventually replaced pound nets as the primary gear used to capture squid during this century, the U.S. industry did not develop the appropriate technology to catch and process squid in offshore waters until the 1980's. Analysis of NMFS weighout data 1982-2010 is used to chart annual averages for U.S. landings (mt), ex-vessel value ($), and prices ($/mt) in the figures below.

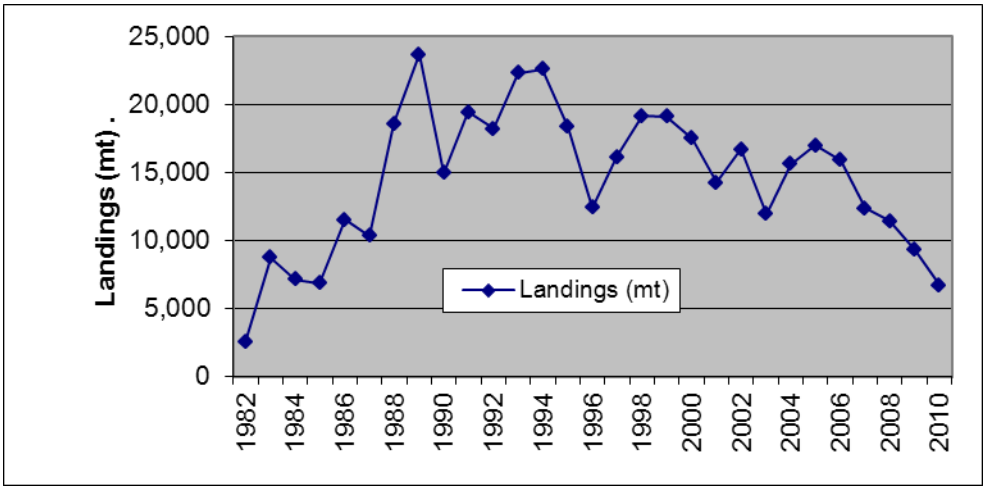

Figure 58. U.S. Longfin Squid Landings.
Source: Unpublished NMFS dealer reports

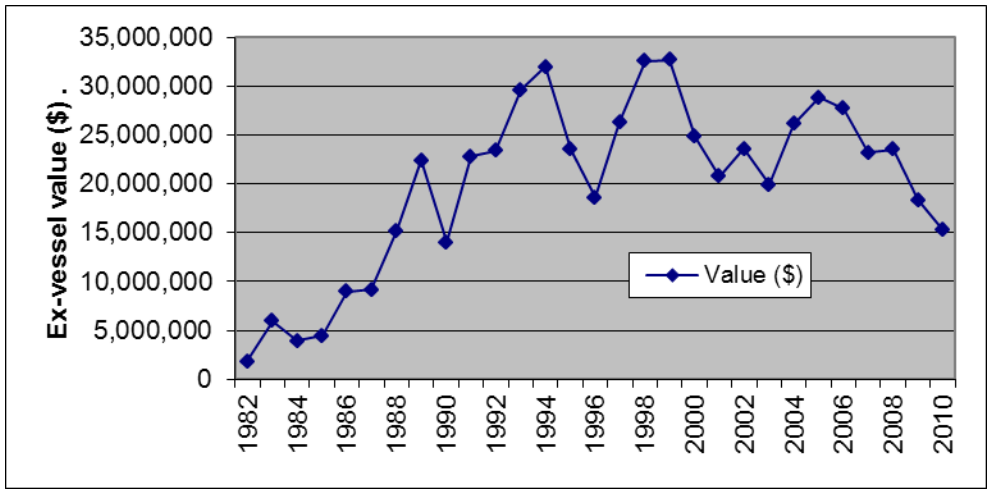

Figure 59. U.S. Longfin Squid Ex-vessel Revenues.
Source: Unpublished NMFS dealer reports

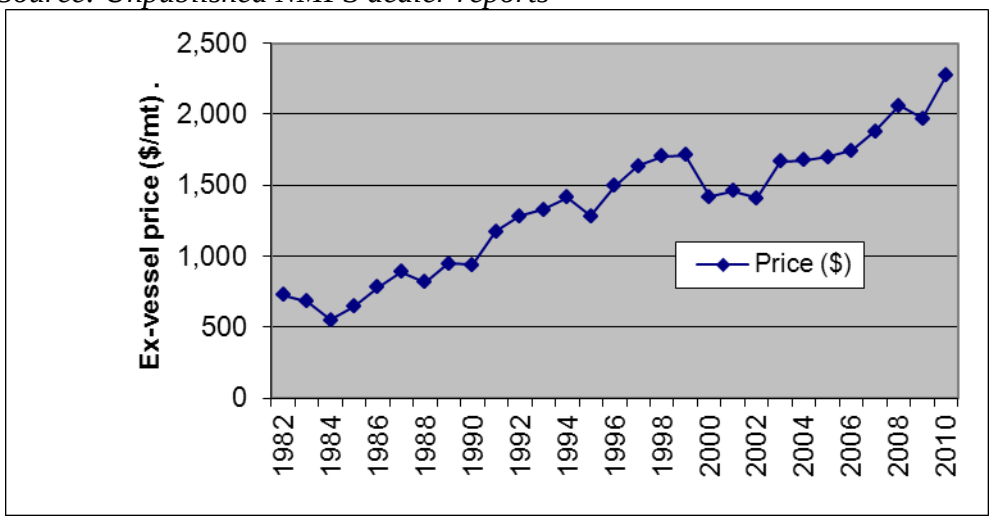

Figure 60. U.S. Longfin Squid Ex-vessel Prices.
Source: Unpublished NMFS dealer reports

Specification Performance

The principle measure used to manage longfin squid is Trimester quota 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 Trimester quotas are reached in Trimesters 1 and 2 and when 95% of the annual DAH is reached in Trimester 3. Mandatory reporting for longfin squid was fully instituted in 1997 so performance since 1997 is most relevant. Table 55 lists the performance of the longfin squid fishery compared to its DAH. There has been one overage in the last 12 years, a 17% overage in 2000. NMFS is continually augmenting its quota projecting procedures so presumably future overages would be even less

likely. There are occasional overages of the trimester quotas, but these are typically minor and should have negligible effects since Trimester 1 and 2 overages are applied to Trimester 3.

As described in the alternatives, the longfin squid DAH is currently divided up into trimesters and has been since 2007. 2000 also had Trimester management while 2001-2006 had quarterly management. Each seasonal time period closes at a threshold of the seasonal allocation, which can result in seasonal closures. The seasonal closures that have occurred are **2000**: March 25-Apr 30; Jul 1-Aug 31; Sep 7-Dec 31; **2001**: May 29-Jun 30; **2002**: May 28-Jun30, Aug 16-Sep 30, Nov 2 -Dec 11, Dec 24-Dec31; **2003**: Mar 25-Mar 31; **2004**: Mar 5- Mar 31; **2005**: Feb 20-Mar 31, April 25-Jun 30, Dec 18-Dec 31; **2006**: Feb 13-Mar 31, April 21-April 26, May 23-June 30, Sept 2-Sept 30; **2007**: April 13-April 30; **2008**: July 17 - Aug 31; **2009**: Aug 6 - Aug 31; **2010**: No closures.

Table 55. Longfin Squid DAH Performance (mt)

Year	Harvest (Commercial and Recreational)	Quota	Percent of Quota Landed
1997	16,113	21,000	77%
1998	19,123	21,000	91%
1999	19,109	21,000	91%
2000	17,475	15,000	117%
2001	14,238	17,000	84%
2002	16,703	17,000	98%
2003	11,935	17,000	70%
2004	15,628	17,000	92%
2005	16,716	17,000	98%
2006	15,907	17,000	94%
2007	12,343	17,000	73%
2008	11,385	17,000	67%
2009	9,307	19,000	49%
2010	6,855	18,667	37%

Source: Unpublished NMFS dealer reports

Commercial Fishery and Community Analysis

The following tables describe, for longfin squid in 2010, the total landings, value, numbers of vessels making landings, numbers of trips landing longfin squid (Table 56), landings by state (Table 57), landings by month (Table 58), landings by gear (Table 59), landings by port (Table 60), numbers of permitted and active vessels by state (Table 61), numbers of permitted and active dealers by state (Table 62), and landings by NMFS federal permit category (Table 63). Previous Specification EA's have included additional port information (dependence) but because of confidentiality concerns such tables are not able to include much relevant information and have been deleted.

Table 56. Total Landings and Value Longfin Squid During 2010.
(Based on unpublished NMFS dealer reports. For Vessels and Trips, only landing records with recorded NERO Permits or Hull Numbers landing over 1,000 pounds annually for "Vessels" and 100 pounds on a trip for "Trips" are considered. Since some state records do not include permit/hull information, the vessel and trip numbers are somewhat underestimated but account for the vast majority of landings.)

	Landings (mt)	Value ($)	Vessels	Trips	$/mt
Longfin squid	6,855	15,675,661	197	4,479	$2,287

Source: Unpublished NMFS dealer reports

Table 57. Longfin Squid Landings (mt) by State in 2010.

State	Landings_mt	Pct_of_Total
Rhode Island	3,342	49%
New York	1,769	26%
New Jersey	713	10%
Massachusetts	701	10%
Connecticut	303	4%
Virginia	25	0%
Maryland	1	0%
Maine	0	0%
Total	6,855	100%

Source: Unpublished NMFS dealer reports

Table 58. Longfin Squid Landings (mt) by Month in 2010.

MONTH	Landings_mt	Pct_of_Total
January	544	8%
February	345	5%
March	296	4%
April	278	4%
May	790	12%
June	543	8%
July	644	9%
August	280	4%
September	730	11%
October	1,075	16%
November	738	11%
December	590	9%
Totals	6,855	100%

Source: Unpublished NMFS dealer reports

Table 59. Longfin squid Landings (mt) by Gear Category in 2010.

GEAR_NAME	Landings (mt)	Pct of Total
TRAWL,OTTER,BOTTOM,FISH	5,359	78%
UNKNOWN	1,043	15%
TRAWL,OTTER,MIDWATER	215	3%
Other	237	3%
Totals	6,855	100%

Source: Unpublished NMFS dealer reports

Table 60. Longfin Squid Landings by Port in 2010.

Port	State	Landings mt	Pct of Total
POINT JUDITH	RHODE ISLAND	2,713	40%
MONTAUK	NEW YORK	1,109	16%
NORTH KINGSTOWN	RHODE ISLAND	591	9%
CAPE MAY	NEW JERSEY	530	8%
NEW BEDFORD	MASSACHUSETTS	373	5%
HAMPTON BAYS	NEW YORK	351	5%
OTHER BARNSTABLE	MASSACHUSETTS	200	3%
STONINGTON	CONNECTICUT	177	3%
POINT LOOKOUT	NEW YORK	174	3%
POINT PLEASANT	NEW JERSEY	109	2%
BELFORD	NEW JERSEY	74	1%
Others	NA	455	7%
Total	NA	6,855	100%

Source: Unpublished NMFS dealer reports

Table 61. Longfin Squid-Butterfish Moratorium Vessel Permit Holders in 2010 by Homeport State (HPST) and How Many of Those Vessels Were Active (landed longfin squid)

HPST	Permitted Vessels	Active Vessels
MA	96	22
NJ	84	46
NY	54	43
RI	51	44
NC	22	8
ME	17	0
VA	13	1
CT	7	6
MD	2	2
NH	2	0
PA	2	0
WV	1	1
Total	351	173

Source: Unpublished NMFS dealer reports

Table 62. Mackerel, Squid, Butterfish Dealer Permit Holders by State and How Many Were Active (bought longfin squid) in 2010 by State.

State	Permitted Dealers	Active Dealers
NY	87	36
RI	39	19
MA	109	15
NJ	39	9
VA	17	5
CT	6	2
MD	8	2
ME	19	2
NC	24	0
Others	18	0
Total	366	90

Source: Unpublished NMFS dealer reports

Table 63. Longfin Squid Landings by Permit Category for the Period 2000-2010.

Year	Loligo/Butterfish Moratorium Permit		Party/Charter		Incidental		No Permit/ Unknown		Total	
	mt	%	mt	%	mt	%	mt	%	mt	Quota
2001	13,423	94%	0	0%	170	1%	640	4%	14,232	17,000
2002	15,275	91%	4	0%	408	2%	1,016	6%	16,703	17,000
2003	10,988	92%	0	0%	98	1%	850	7%	11,935	17,000
2004	14,183	91%	1	0%	163	1%	1,281	8%	15,628	17,000
2005	15,068	90%	0	0%	73	0%	1,562	9%	16,703	17,000
2006	14,318	90%	0	0%	294	2%	1,295	8%	15,907	17,000
2007	11,360	92%	0	0%	230	2%	753	6%	12,343	17,000
2008	10,833	95%	0	0%	319	3%	233	2%	11,385	17,000
2009	8,719	94%	0	0%	266	3%	322	3%	9,307	19,000
2010	6,392	93%	1	0%	253	4%	207	3%	6,853	18,667

Source: Unpublished NMFS dealer reports and Permit database

Description of Areas Fished in VTR Reports

Vessel Trip Reports (VTRs) represent captains' estimates of kept weight of fish/squid. VTR reports, which are a subset of the landings data, provide the approximate location of kept fish/squid. VTR reports for longfin squid in 2010 by NMFS three digit statistical area (see Figure 47 except as noted in table below) are given in Table 64.

Table 64. Statistical Areas From Which 1% or More of Longfin Squid Were Kept in 2010 According to VTR Reports.

Stat Area	Landings (mt)	Percentage from Area
616	2,470	33%
622	1,040	14%
537	595	8%
613	466	6%
612	465	6%
525	339	5%
539	333	4%
632	275	4%
611	226	3%
562	209	3%
538	197	3%
626	173	2%
121	86	1%

Source: Unpublished NMFS VTR reports

Butterfish Catch/Mortality Cap

Beginning in 2011 the longfin squid fishery was subject to closure if it caught too much butterfish (amounts are set annually - 1,436 mt in 2011), with the cap divided up such that closures could occur in Trimesters 1 (Jan-Apr) and 3 (Sept-Dec). The cap is important for the longfin squid fishery because changes in the butterfish specifications, and the resulting cap amount, can have effects related to the "shadow value" of butterfish for the longfin squid fishery (longfin Squid and butterfish are often caught together). Because of the butterfish cap, a constraint on total butterfish catch may limit production in the squid fishery, so butterfish takes on a "shadow value" in terms of the indirect impact on the longfin squid fishery. While the exact relationship between butterfish and longfin squid catches is unknown ahead of time for any given year, the "shadow value" of butterfish could be quite large; that is, the longfin squid fishery may recognize large increases in landings/revenues/profits from relatively small increases in the butterfish specifications (and vice-versa with decreases).

There was not a closure in Trimester 1 of 2011. As of December 1, 2011 the cap had not yet caused any closures of the longfin squid fishery and had utilized 56% of the total annual cap. The longfin squid fishery will close if 90% of the annual cap is utilized. Given the average 2011 rates of squid and butterfish catch, a cap closure probably will not occur in 2011 but the final result will depend on the observed catch rates in the final months of 2011. The cap operates in near real-time so operation in 2012 will depend on the total and relative amounts of longfin squid and butterfish caught in 2012. Additional details on the cap may be found here: http://www.nero.noaa.gov/nero/regs/frdoc/11/11SMB2011ButterfishSpecsRevisedCAP.pdf.

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7.0 Analysis of the Impacts of the Alternatives

For all Alternative Sets (1-8) and all valued ecosystem components (VECs), the first alternative ("a") equals no-action, which is what is predicted to happen with the status quo management measures. Subsequent alternatives are the action alternatives and diverge from the status quo management measures as described in Section 5. The impact analysis focuses on the valued ecosystem components (VECs) that were identified for Amendment 14 and described in detail in Section 6.0 of this document. These VECs include:

1. Managed Resources
   - Atlantic mackerel stock
   - *Illex* stock
   - Longfin squid stock
   - Atlantic butterfish stock

2. Non-target species
   -Non-Target species include river herrings (blueback and alewife) and shads (American and hickory), collectively referred to as RH/S. Given the lack of information on how these species travel and mix in the ocean, different impacts are generally not discernible between these species but are noted where appropriate (for example in caps that are placed on particular species)

3. Habitat including EFH for the managed resources and non-target species

4. Endangered and other protected resources

5. Human Communities

While in previous MSB FMP EISs the impacts from all alternatives are grouped together for each VEC, with the large number of alternatives in this amendment (about 80), the result would that one would start with managed resources, have ~80 associated impacts, then have ~80 impacts for non-target species, and so on with the other VECs. This format seemed to lead to a disconnect in evaluating each alternative in terms of its overall positive and negative impacts across different VECs. As a result, the impact analysis in this EIS proceeds alternative by alternative with impacts for each VEC described for a given alternative before moving on to the next alternative's impacts (Sections 7.1-7.8). Section 7.9 summarizes combined effects of the Council's preferred alternatives by VEC.

In this section, a variety of terms (e.g. positive or negative) have specific meanings for each VEC and are described below.

Managed Species, Non-Target Species, Protected Species:

Note: Often impacts are indirect in that an action may change overall effort, which would decrease impacts if effort goes down or increase impacts if effort goes up.

Neutral/negligible: actions that are expected to have no discernible impact on stock/population size.

Positive: actions that increase stock/population size

Negative: actions that decrease stock/population size

Habitat:

Note: Often impacts are indirect in that an action may change overall effort, which would decrease impacts if effort goes down or increase impacts if effort goes up.

Neutral/negligible: actions that are expected to have no discernible impact on habitat

Positive: actions that improve the quality or reduce disturbance of habitat

Negative: actions that degrade the quality or increase disturbance of habitat

Human Communities:

Neutral/negligible: actions that are expected to have no discernible impact on human communities

Positive: actions that increase revenue and well-being of fishermen, associated businesses, or other interested parties.

Negative: actions that decrease revenue and well-being of fishermen, associated businesses, or other interested parties.

Mixed: The action would create benefits for some and costs for others. Generally in such cases there are costs to MSB fishery participants but potential benefits to other fishermen (commercial or recreational) or other interested parties who value MSB or RH/S resources.

Impact Qualifiers:

The following qualifiers are also used in the impact analysis:

Low (as in *low* positive or *low* negative): to a lesser or small degree
High (as in *high* positive or *high* negative) to a greater or large degree
Potentially: A relatively higher degree of uncertainty is associated with the impact. Often this qualifier is used when an action may lead to better data, but future actions would have to actually use that data in decision making in order for there to be a concrete benefit.

If impacts are expected to be isolated to a particular species, usually either mackerel, longfin squid, *Illex* squid, butterfish, or river herrings and shads (RH/S) then this fact will be noted as well.

All comparisons are in reference to changes from the no-action alternative or relative to other alternatives in the document. To some extent, the operation of the MSB fisheries is currently negatively affecting the target stocks, RH/S stocks, other non-target species, habitat, and protected resources compared to if there was no fishery. Thus, the theoretical "lost opportunities" of not taking action compared to taking action are also described under impacts for the "no-action" alternative within each Alternative Set.

Note on the Difficulties in Linking Impacts from Amendment 14 and Benefits Related to RH/S Conservation:

To the extent that alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other species, then choosing such alternatives might result in long term benefits to society related to future commercial revenues (profit information is unavailable), recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). The benefits of rebuilding fisheries for even just commercial utilization are generally well documented and accepted, for example as in Costello et al 2012. While recreational anglers can usually substitute species when one is unavailable (thereby minimizing welfare losses) there are still likely some benefits for every additional species that is available (Haab et al 2000) and there are potentially many anglers (there were about 7 million total coast-wide (Atlantic) participating in-state anglers from Atlantic Coast states in 2010) who could realize such benefits. RH/S also support many predator populations that may provide related recreational benefits (from additional angling opportunities to bird and whale watching). Coupled with the positive benefits related to various cultural events (river herring and shad festivals), and existence values, the benefits of rebuilt RH/S populations are likely quite large.

One would expect that higher related benefits would result from actions that were more likely to restore RH/S populations. However, due to the uncertainty about how the productivity of RH/S is impacted by current catch levels overall and in the MSB fisheries in particular, it is difficult to quantity how such benefits may relate to measures considered in this document. The amount of benefit to RH/S stocks from any action affecting the MSB fisheries is unknown, so even though one might contemplate what the value of rebuilt RH/S fisheries might be, it is not possible to

know if an action in this document might actually lead or even substantially contribute to rebuilt RH/S fisheries because of the range of issues likely affecting RH/S stocks (ASMFC 2012, ASMFC 2007). This theme is repeated as appropriate in the Impacts Sections below.

7.1 Alternative Set 1: Additional Vessel Reporting Measures

Statement of Problem/Need for Action:

Relatively low levels of catch monitoring have resulted in relatively high uncertainty about catch of RH/S in Mid-Atlantic and New England fisheries, especially mid-water trawl (MWT) and small mesh bottom trawl (SMBT), both of which are used in the MSB fisheries. The Council is therefore considering actions to decrease uncertainty so as to improve the management of RH/S catches.

Background:

The measures in Alternative Set 1 would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. While some of the focus may appear to be on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries, because extrapolations are often made based on total landings, accurate monitoring of the target species can be as important as determining the encounter rates of RH/S. This is because when estimations of non-target catch (including discards) such as RH/S are made with observer data, they are made based on the ratio of RH/S to total retained catch applied to landings data. For example, if it was found that in observer data, 1 pound of RH/S was caught for every 100 pounds of fish landed by mackerel vessels, and those same vessels landed 1,000,000 pounds of fish, one could estimate that 10,000 pounds of RH/S were caught. While small differences in the total landings number will not affect the estimate substantially, it is still important for both the ratio ***and*** the total landings number to be as accurate as feasibly possible.

NOTE ON COMBINATIONS: Most of the Alternative Set 1 action alternatives could be implemented individually or collectively. However, 1c (weekly VTRs for all MSB permits) would encompass 1bMack and 1bLong so these would not be selected together. The 48-hr mackerel pre-trip notification (1d48) and 72-hr mackerel pre-trip notification (1d72) would also be mutually exclusive – only one would be chosen if either. The VMS reporting alternatives (1f's and 1g's) would need the respective 1e's (that require VMS) for each fishery as a prerequisite before requiring VMS reporting.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

1a. No-action

If this alternative is selected, then no measures from Alternative Set 1 would be implemented and the existing reporting measures (as described in section 5.1) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 1 would somewhat improve reporting timeliness and accuracy, provide for better observer placement on directed mackerel trips, and potentially facilitate dockside monitoring and/or enforcement, there would be some foregone benefits if the no-action alternative is chosen. However, since the current reporting requirements are anticipated to be sufficient for quota monitoring of the managed species (there are no reported problems with current quota monitoring), it is not anticipated there would be any impacts on the managed resources. Dealer data is currently used to monitor MSB quotas, but due to the timeliness of dealer data (weekly) and VTR data (monthly), cross-checking data can take quite a long time. Implementing the no-action alternative compared to the other alternatives would forgo the benefit of being able to cross-check and reconcile data on a more real-time basis if weekly VTR reporting was implemented.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A negative impact would be expected compared to the action alternatives. Observer data is the primary source of data for discards, which are often non-target species. Since alternatives in Alternative Set 1 would provide for better observer placement there would be some foregone benefits to non-target species if the no-action alternative is chosen since better non-target catch information could lead to better management decisions. Alternatives in Alternative Set 1 could also potentially facilitate dockside monitoring (via VMS landings notifications), which could improve knowledge about retained non-target catch. Also, while monitoring of the managed species has not been a problem, to the degree that managed species catch is used in extrapolations for non-target species catch (see background above), more timely and accurate reporting of managed resources can also have an indirect benefit for non-target species and these indirect benefits would be forgone by selection of the no-action alternative.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the action alternatives. The action alternatives in Alternative Set 1 would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing

fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes in gear interactions with habitat, over time.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the action alternatives. The action alternatives in Alternative Set 1 would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with protected species, over time.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants of the additional reporting requirements would be avoided, which is a positive impact. These costs include additional VTR mailings, departure delays related to waiting for observers following pre-trip notifications, VMS costs, and the time taken to complete these requirements.

On the other hand, to the extent that Alternative Set 1 alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits.

These could include lost commercial revenues, lost recreational opportunities, lost cultural values for RH/S, and/or other lost non-market existence values (i.e. value related to the knowledge that these species are being conserved successfully) resulting from diminished stocks compared to optimally productive stocks. Due to the uncertainty about how the mackerel and longfin squid fisheries are impacting either the managed species or RH/S, these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

<u>1bMack</u>. Institute weekly vessel trip reporting (VTR) for mackerel permits.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate mackerel quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. In situations where NMFS might have otherwise over-projected landings and issued a premature fishery closure, more frequent VTR reporting could allow additional landings, but not more than should be sustainable for each target fishery because overall landings are limited by a hard quota. In situations where NMFS might have otherwise under-projected landings and issued a closure for the fishery after the closure threshold had truly been reached, more frequent VTR reporting would avoid exceeding catch limits (by closing fisheries earlier). Since there is overlap in permits (some vessels have permits for all MSB species), there could also be some similar benefits to the other managed species because any mackerel-permitted vessel would have to report weekly even if targeting and catching other species.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring (directed or non-target catch) compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. Any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with non-target species, over time.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes in gear interactions with habitat, over time.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with protected species, over time.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The number of total mackerel permits can vary from month to month. Of the 1,974 vessels that had mackerel permits in November 2011, 67 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus, about 67 vessels would ultimately be subject to additional reporting requirements because of this measure. Those 67 vessels must currently submit VTR reports monthly. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs. This would result in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permitted vessel. Since VTRs must be filled out currently, the only additional time cost is the time cost of making a separate mailing which is negligible. Also, in situations where NMFS might have otherwise under-projected landings and issued a closure for the fishery after the closure threshold had truly been reached, more frequent VTR reporting would avoid exceeding catch limits (by closing fisheries), which could lower short-term revenues.

On the other hand, in situations where NMFS might have otherwise over-projected landings and issued a premature fishery closure, more frequent reporting could allow additional landings and revenues but not more than should be sustainable for each target fishery because overall landings are limited by a hard quota.

Also, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, increased recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable, but since benefits to other VECs are low or negligible, the associated human community benefits should also be low or negligible as well.

<u>1bLong</u>. Institute weekly vessel trip reporting (VTR) for longfin squid/Butterfish permits.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate longfin squid quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. In situations where NMFS might have otherwise over-projected landings and issues a premature fishery closure, more frequent VTR reporting could allow additional landings, but not more than should be sustainable for each target fishery because overall landings are limited by a hard quota. In situations where NMFS might have otherwise under-projected landings and issue a closure for the fishery after the closure threshold had truly been reached, more frequent VTR reporting would avoid exceeding catch limits (by closing fisheries earlier). Since there is overlap in permits (some vessels have permits for all MSB species), there could also be some similar benefits to the other managed species because any longfin squid/Butterfish -permitted vessel would have to report weekly even if targeting and catching other species.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring (direct or non-targeted catch) compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. Any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with non-target species, over time.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes in gear interactions with habitat, over time.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with protected species, over time.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The number of incidental squid/butterfish permits can vary from month to month. Of the 1,891 vessels that had longfin squid /Butterfish Moratorium permits or squid/butterfish incidental permits in November 2011, 74 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus, about 74 vessels would ultimately be subject to additional reporting requirements because of this measure. Those 74 vessels must currently submit VTR reports monthly. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs, resulting in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permitted vessel. Since VTRs must be filled out currently, the only additional time cost is the time cost of making a separate mailing which is negligible. For informational purposes, about 9 of the 351 longfin squid /Butterfish moratorium permits do not currently have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Also, in situations where NMFS might have otherwise under-projected landings, better reporting would avoid exceeding catch limits (by closing fisheries), lowering short-term revenues.

On the other hand, in situations where NMFS might have otherwise over-projected landings, better reporting could allow additional landings but not more than should be sustainable for the fishery. Also, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable, but since benefits to other VECs are low or negligible, the associated human community benefits should also be low or negligible as well.

1c. Institute weekly vessel trip reporting (VTR) for all MSB permits (Mackerel, longfin squid//Butterfish, *Illex*) so as to facilitate quota monitoring (directed landings and/or mortality cap if applicable) and cross checking with other data sources. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate MSB quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. In situations where NMFS might have otherwise over-projected landings and issued a premature fishery closure, more frequent VTR reporting could allow additional landings, but not more than should be sustainable for each target fishery because overall landings are limited by a hard quota. In situations where NMFS might have otherwise under-projected landings and issued a closure for the fishery after the closure threshold had truly been reached, more frequent VTR reporting would avoid exceeding catch limits (by closing fisheries earlier).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially low positive impact would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring (direct or non-targeted catch) compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes in the precision of quota monitoring if this alternative is selected. Any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with non-target species, over time.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes in gear interactions with habitat, over time.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. This action alternative would somewhat provide for more timely and accurate quota monitoring compared to the no-action alternative. NMFS makes projections in order to close fisheries so having the timeliest and most accurate data reduces uncertainty about closing fisheries at the appropriate time. However, NMFS has not had major problems tracking and projecting MSB quotas in recent years so there should not be large changes, and any changes could slightly either lengthen a season or shorten a season in any given year, probably leading to only minimal changes in effort, and thus negligible changes rates of encounters with protected species, over time.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. Of the 2,622 vessels that have MSB permits in November 2011, 121 did not also have a weekly VTR reporting requirement from another permit (herring or NE multispecies). Thus about 121 vessels would ultimately be subject to additional reporting requirements because of this measure. This alternative would result in 40 (52 (weeks) -12 (months) = 40) additional VTR submissions per year for permit holders that don't currently submit weekly VTRs, resulting in additional mailing costs of $19.36 per year (40 x $ 0.44 postage) per permit holder. The 121 vessels encompass the same affected vessels from 1bMack and 1bLong above (there is some overlap between 1bMack and 1bLong). Since VTRs must be filled out currently, the only additional time cost is the time cost of making a separate mailing which is negligible. Also, in situations where NMFS might have otherwise under-projected landings, better reporting would avoid exceeding catch limits (by closing fisheries), lowering short-term revenues.

On the other hand, in situations where NMFS might have otherwise over-projected landings, better reporting could allow additional landings but not more than should be sustainable for the fishery. Also, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable, but since benefits to other VECs are low or negligible, the associated human community benefits should also be low or negligible as well.

This alternative, which would institute weekly VTR reporting for all MSB permits rather than just one or two categories of permits (see 1bMack or 1bLong above), also has a benefit of simplifying reporting requirements because reporting would be more consistent across fisheries within the MSB FMP as well as across other FMPs (e.g. herring and Northeast multispecies) in the region.

<u>1d48</u>. Require 48 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative of no notification requirements. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective monitoring of discards of the managed species there may be some positive impacts to the managed species compared to the no-action alternative. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low. It is not expected that there would be any biological differences between 48 and 72 hour notifications.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective management/reduction of non-target catch (including RH/S), this alternative could lead to positive impacts for non-target species compared to the no-action alternative. If a mortality cap on RH/S is implemented, obtaining a complete list of trips to sample becomes very important to ensure that NMFS is able to generate unbiased catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. More accurately targeting directed mackerel trips for observer coverage should not lead to any changes in fishing effort.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective management/reduction of protected resource interactions in the future, this alternative could lead to positive impacts for protected resources compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. This is similar to a 48-hour trip notification requirement in the longfin squid fishery that became effective in 2013. Fishermen have reported that the 48-hour notification sometimes means they are unable to target fleeting aggregations of longfin squid because they are not able to put to sea on short notice, especially if they are selected to take an observer. Fishermen have reported to Mid-Atlantic Council staff that a 24-hour notice would be best and that a 48 hour notice, while better than 72 hours, would still make it difficult for them to react to rapidly changing environmental and weather conditions. Therefore, compared to Alternative 1d72, this alternative may have a slightly less negative impact on human communities. It is estimated that notifying the observer program would take about 5 minutes per notification.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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1d72. Require 72 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative of no notification requirements. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective monitoring of discards of the managed species there may be some positive impacts to the managed species compared to the no-action alternative. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low. It is not expected that there would be any biological differences between 48 and 72 hour notifications.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective management/reduction of non-target catch (including RH/S), this alternative could lead to positive impacts for non-target species compared to the no-action alternative. If a mortality cap on RH/S is implemented, obtaining a complete list of trips to sample becomes very important to ensure that NMFS is able to generate unbiased catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. More accurately targeting directed mackerel trips for observer coverage should not lead to any changes in fishing effort.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. Pre-trip notifications can lead to more systematic placement of observers, leading to better observer data that more accurately represents a particular fleet's catches. To the degree that better observer data leads to more effective management/reduction of protected resource interactions in the future, this alternative could lead to positive impacts for protected resources compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. This is similar to a 48-hour trip notification requirement in the longfin squid fishery that became effective in 2013. Fishermen have reported that the 48-hour notification sometimes means they are unable to

target fleeting aggregations of longfin squid because they are not able to put to sea on short notice, especially if they are selected to take an observer. Fishermen have reported to Mid-Atlantic Council staff that a 24-hour notice would be best and that a 48 hour notice, while better than 72 hours, would still make it difficult for them to react to rapidly changing environmental and weather conditions. Therefore, compared to alternative 1d48, this alternative may have slightly more negative impacts on human communities. It is estimated that notifying the observer program would take about 5 minutes per notification.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

1eMack. Require VMS for limited access mackerel vessels. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. VMS is particularly useful to monitor area-based management measures but area-based measures are not currently or proposed to be used for management of the managed species. Requiring a VMS unit is helpful for enforcement purposes, but if implemented without any of the other alternatives proposed in this action, would not be likely to have any substantial impacts to the managed resources compared to the no-action alternative. Alternative Sets 7 and 8 involve area-based management measures related to RH/S catch, which could reduce effort and catch of mackerel, so to some degree VMS could indirectly facilitate a positive impact for the managed species. However, there is no information to suggest that current mackerel catches are causing sustainability problems. Alternative 1fMack involves catch reporting through VMS and additional impacts are discussed below for that alternative related to improved catch monitoring.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. No direct impacts compared to the no-action alternative would be expected (including for RH/S) just by having VMS operating on a vessel. However, if area based management is selected in this amendment (Alternative Sets 7 and 8), VMS could be useful as a complementary compliance/enforcement tool, and area-based closures could reduce mackerel catch and effort and thus reduce non-target impacts. VMS also can be used as a tool for fleet communication to voluntarily avoid localized RH/S aggregations. In addition, alternative 1fMack involves catch reporting through VMS and additional impacts are discussed below for that alternative related to improved catch monitoring.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Selected alone, requiring a VMS unit for all limited access mackerel vessels is unlikely to change fishing effort. Therefore, no impacts are expected compared to the no-action alternative. Even if VMS is used in conjunction with area-based closures that reduce overall effort, since the majority of mackerel landings are made with mid-water gear that should have minimal impact on the bottom, negligible habitat impacts would be expected.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. No direct protected resources impacts compared to the no-action alternative would be expected just by having VMS operating on a vessel. However, if area based management is selected in this amendment (Alternative Sets 7 and 8), VMS could be useful as a complementary compliance/enforcement tool, and area-based closures could reduce mackerel catch and effort and thus reduce protected resource impacts. VMS also can be used as a tool for fleet communication to voluntarily avoid localized protected resource aggregations.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. Of the approximately 2,200 vessels that had open access mackerel permits at some point in 2011, 684 were not also required to have VMS related to permit requirements for other northeast region fisheries. While not all of these vessels will qualify for mackerel limited access (being implemented currently), 684 is a reasonable estimate for the upper bound on how many vessels could have to buy new VMS units. Amendment 11 estimated that around 400 vessels might qualify for limited access. If one maintains the ratio of open access boats (684/2,200 = 31%) that would need VMS for the 400 likely qualifiers for mackerel limited access, 31% of 400 equals 124 vessels that would actually need new VMS units. Since limited access qualifiers, being

more active participants, may be more likely to have other permits that require VMS, the likely number may be somewhat lower than 124. Until the final number of qualifiers is determined it is not possible to further quantify the number of vessels that may require VMS units under this provision. 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, which would add to the costs. In summary, requiring a VMS for mackerel limited access vessels will likely have a negative impact on human communities compared to the no-action alternative.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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1eLong. Require VMS for longfin squid/butterfish moratorium vessels (see 1f and 1g below). (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. VMS is particularly useful to monitor area-based management measures but area-based measures are not currently or proposed to be used for management of the managed species. Requiring a VMS unit is helpful for enforcement purposes, but if implemented without any of the other alternatives proposed in this action, would not be likely to have any impacts to the managed resources compared to the no-action alternative. Alternative Sets 7 and 8 involve area-based management measures related to RH/S catch, and could reduce effort and catch of longfin squid (and butterfish indirectly), so to some degree VMS could indirectly facilitate a positive impact for longfin squid and butterfish. However, there is no information to suggest that current longfin squid or butterfish catches are causing sustainability problems. Alternative 1fLong involves catch reporting through VMS and additional impacts are discussed below for that alternative related to improved catch monitoring.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. No direct impacts compared to the no-action alternative would be expected (including for RH/S) just by having VMS operating on a vessel. However, if area based management is selected in this amendment (Alternative Sets 7 and 8), VMS could be useful as a complementary compliance/enforcement tool, and area-based closures could reduce longfin squid and/or butterfish catch and effort. VMS also can be used as a tool for fleet communication to voluntarily avoid localized RH/S aggregations. In addition, alternative 1fLong involves catch reporting through VMS and additional impacts are discussed below for that alternative related to improved catch monitoring.

3. Habitat Impacts Including EFH

A potentially positive impact would be expected compared to the no-action alternative. Selected alone, requiring a VMS unit for all limited access longfin squid/butterfish moratorium vessels is unlikely to change fishing effort. However, if area based management is selected in this amendment (Alternative Sets 7 and 8), VMS could be useful as a complementary compliance/enforcement tool, and area-based closures could reduce longfin squid effort which would lead to positive habitat impacts.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. No direct protected resources impacts compared to the no-action alternative would be expected just by having VMS operating on a vessel. However, if area based management is selected in this

amendment (Alternative Sets 7 and 8), VMS could be useful as a complementary compliance/enforcement tool, and area-based closures could reduce longfin squid catch and effort and thus reduce protected resource impacts. VMS also can be used as a tool for fleet communication to voluntarily avoid localized protected resource aggregations.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. Of the 351 vessels that had longfin squid /butterfish moratorium permits in 2011, only 7 were not also required to have VMS related to permit requirements for other northeast region fisheries and would have to equip their vessel with VMS under this provision. 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, which would add to the costs. In summary, requiring a VMS for limited access longfin squid/butterfish moratorium vessels will likely have a negative impact on human communities compared to the no-action alternative.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

1fMack. Require daily VMS reporting of catch by limited access mackerel vessels so as to facilitate monitoring (directed and/or unintended catch) and cross checking with other data sources. Requiring VMS (see 1eMack above) and requiring trip declarations (would be a prerequisite for this alternative. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. To the degree that more rapid reporting could be used to cross check dealer data to ensure that fishery closures (managed species) occur appropriately, there could be positive benefits to mackerel compared to the no-action alternative but such benefits are likely low because dealer data is the primary data source for landings tracking and there is no history of overages.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially low positive impact would be expected compared to the no-action alternative. To the degree that more rapid reporting could be used to cross check dealer data to ensure that fishery closures (due to catch of non-target species (including for RH/S)) occur appropriately, there could be positive benefits compared to the no-action alternative but such benefits are likely low because dealer data is the primary data source for landings tracking and there is no history of overages.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring VMS catch reporting for all limited access mackerel vessels is unlikely to change fishing effort. Therefore, no impacts are expected compared to the no-action alternative, especially since the majority of mackerel landings are made with mid-water gear which should have negligible impact on the bottom.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternatives. Requiring VMS catch reporting for all limited access mackerel vessels is unlikely to change fishing effort. Therefore, no impacts are expected compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The cost of transmitting a catch report via VMS is $0.60 per transmission. There is a wide range of fishing activity toward mackerel so multiplying average days fished by $0.60 per day would not be illustrative for many vessels. Most vessels impacted by this provision would know how many days they fished for mackerel in a year so they can just multiply $0.60 by days they would be likely to declare into mackerel fishing to determine an annual impact on their business. For example, if a vessel were to declare into the mackerel fishery for 100 days in a year, then they would have $60 in annual costs associated with this provision. Also, each VMS report is estimated to take 5 minutes to complete.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable.

Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

1fLong. Require daily VMS reporting of catch by longfin squid moratorium permits so as to facilitate monitoring (directed and/or unintended catch) and cross checking with other data sources. Requiring VMS (see 1eLong above) and requiring trip declarations would be a prerequisite for this alternative. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. To the degree that more rapid reporting could be used to cross check dealer data to ensure that fishery closures (managed species) occur appropriately, there could be positive benefits to longfin squid compared to the no-action alternative but such benefits are likely low because dealer data is the primary data source for landings tracking and there is no history of recent annual overages in this fishery (the annual quota is divided into 3 seasonal trimesters and there have been some relatively small seasonal overages).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially low positive impact would be expected compared to the no-action alternative. To the degree that more rapid reporting could be used to cross check dealer data to ensure that fishery closures (due to catch of non-target species(including for RH/S)) occur appropriately, there could be positive benefits compared to the no-action alternative but such benefits are likely low because dealer data is the primary data source for landings tracking and there is no history of overages. Area based monitoring for RH/S is proposed in other alternatives in this action (Alternative Set 7), and VMS is useful for enforcement of area-based management.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring VMS catch reporting for all limited access longfin squid/butterfish moratorium vessels is unlikely to change fishing effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring VMS catch reporting for all limited access longfin squid/butterfish moratorium vessels is unlikely to change fishing effort. Therefore, no impacts are expected compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The cost of transmitting a catch report via VMS is $0.60 per transmission. There is a wide range of fishing activity toward longfin squid so multiplying average days fished by $0.60 per day would not be illustrative for many vessels. Most vessels impacted by this provision would know how many days they fished for mackerel in a year so they can just multiply $0.60 by days they would be likely to declare into mackerel fishing to determine an annual impact on their business. For example, if a vessel were to declare into the longfin squid fishery for 100 days in a year, then they would have $60 in annual costs associated with this provision. Also, each VMS report is estimated to take 5 minutes to complete.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

<u>1gMack</u>. Require 6 hour pre-landing notification via VMS to land more than 20,000 pounds of mackerel, which could facilitate quota monitoring, enforcement, and/or portside monitoring. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative (where none is required because there is no VMS). VMS pre-landing notifications could facilitate enforcement of landings limits and landings reporting. Impacts are low compared to the no-action alternative because there are no known issues with mackerel landing limits or mackerel reporting requirements being violated.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. Pre-landings notifications could facilitate port-side sampling (see Alternative Set 4). Port side sampling could lead to better information on non-target interactions (including for RH/S) which could lead to better management of non-target species compared to the no-action alternative.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring a 6 hour pre-landing notification would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Compared to the no-action alternative, requiring a 6 hour pre-landing notification would not be expected to change effort so negligible impacts would be expected compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The cost of transmitting a catch report via VMS is $0.60 per transmission. There is a wide range of fishing activity toward mackerel so multiplying average trips fished by $0.60 per trip would not be illustrative for many vessels. Most vessels impacted by this provision would know how many trips they fished for mackerel in a year so they can just multiply $0.60 by trips they would be likely to land mackerel to estimate an annual impact on their business. For example, if a vessel were to land over 20,000 pounds of mackerel for 50 trips in a year, then they would have $30 in annual costs associated with this provision. Also, each VMS report is estimated to take 5 minutes to complete.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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<u>1gLong</u>. Require 6 hour pre-landing notification via VMS to land more than 2,500 pounds of longfin squid, which could facilitate quota monitoring, enforcement, and/or portside monitoring.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. VMS pre-landing notifications could facilitate enforcement of landings limits and landings reporting. Impacts are low compared to the no-action alternative because there are no known issues with longfin squid landing limits or longfin squid reporting requirements being violated.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. Pre-landings notifications could facilitate port-side sampling (see Alternative Set 4). Port side sampling could lead to better information on non-target interactions (including for RH/S) which could lead to better management of non-target species compared to the no-action alternative.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring a 6 hour pre-landing notification would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Compared to the no-action alternative, requiring a 6 hour pre-landing notification would not be expected to change effort so negligible impacts would be expected compared to the no-action alternative.

5. Human Communities

The impacts for human communities appear mixed with uncertain net impacts compared to the no-action alternative. On one hand costs to fishery participants would increase. The cost of transmitting a catch report via VMS is $0.60 per transmission. There is a wide range of fishing activity toward longfin squid so multiplying average trips fished by $0.60 per trip would not be illustrative for many vessels. Most vessels impacted by this provision would know how many trips they fished for longfin squid in a year so they can just multiply $0.60 by trips they would be likely to land longfin squid to estimate an annual impact on their business. For example, if a vessel were to land over 2,500 pounds of longfin squid for 50 trips in a year, then they would have $30 in annual costs associated with this provision. Also, each VMS report is estimated to take 5 minutes to complete.

On the other hand to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the

managed resources and/or RH/S, then choosing this alternative compared to the no-action alternative might result in benefits related to higher future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

Alternative Set 1 Summary - Additional Vessel Reporting Measures

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

All of the action alternatives are expected to have some low incremental managed-resource benefits related to better monitoring and observer placement.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

All of the action alternatives are expected to have some low incremental non-target benefits related to better monitoring and observer placement. Requiring pre-departure notice for mackerel trips (1d48 and 1d72) may be relatively more important in order to generally facilitate effective observer deployment and data collection.

3. Habitat Impacts Including EFH

None of the action alternatives are expected to impact habitat.

4. Protected Resources

Most of the alternatives are not expected to impact protected resources. Requiring pre-departure notice for mackerel trips (1d48 and 1d72) may be relatively more important in order to generally facilitate effective observer deployment and data collection.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial fishing interests would incur relatively low costs related to most of the alternatives being considered. For vessels that do not have VMS units (a minority of the fleet) those costs are moderate related to alternatives that would require VMS (1eMack and 1eLong). The interested public would benefit to a modest degree primarily to the extent that better monitoring could lead to better RH/S management.

7.2 Alternative Set 2 – Additional Dealer Reporting Measures

Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements may be insufficient to precisely estimate RH/S catch. Also, practices on how landing weights are determined are not standardized.

Background:

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. While some of the focus may appear to be on mackerel and/or longfin squid general reporting compared to just RH/S in those fisheries, because extrapolations are often made based on total landings, accurate monitoring of the target species can be as important as determining the encounter rates of RH/S.

NOTE ON COMBINATIONS: Most of the Alternative Set 2 action alternatives could be implemented individually or collectively. However, 2c and 2d (weighing mackerel) would be mutually exclusive – only one would be chosen if either. Likewise, 2e and 2f (weighing longfin squid) would be mutually exclusive – only one would be chosen if either. 2g (dealers can use volume to weight conversions) would modify 2c, 2d, 2e, or 2f so 2g could only be chosen if at least one of those four alternatives was also chosen.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

2a. No-action

If this alternative is selected, then no measures from Alternative Set 2 would be implemented and the existing reporting measures (as described in section 5.2) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 2 would somewhat improve monitoring of the managed resources there would be some foregone benefits if the no-action alternative is chosen. Given there are no major reported issues with current landings monitoring of the managed species, impacts would be expected to be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 2 would improve monitoring of landed species, there would be some foregone benefits to non-target species (including for RH/S) if the no-action alternative is chosen because less information of the landings of those species would be available for future management decisions.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the action alternatives. Dealer reporting is not expected to impact habitat.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the action alternatives. Dealer reporting is not expected to impact protected resources.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants of the additional reporting requirements would be avoided, which is a positive impact. These costs include the time for vessels to confirm landings, and scales for those dealers that do not currently have scales to weigh mackerel or squid.

On the other hand, to the extent that Alternative Set 2 alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits.

These could include lost commercial revenues, lost recreational opportunities, lost cultural values for RH/S, and/or other lost non-market existence values (i.e. value related to the knowledge that these species are being conserved successfully) resulting from diminished stocks compared to optimally productive stocks. Due to the uncertainty about how the mackerel and longfin squid fisheries are impacting either the managed species or RH/S, these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

2b. Require federally permitted MSB dealers to obtain vessel representative confirmation of Standard Atlantic Fisheries Information System transaction records for mackerel landings over 20,000 lb, *Illex* landings over 10,000 lb, and longfin squid landings over 2,500 lb.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded and errors do exist in the dealer database. Given there are no major reported issues with current monitoring of the managed species, impacts would be expected to be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded and errors do exist in the dealer database. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species (including for RH/S).

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring landings data confirmations would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring landings data confirmations would not be expected to change effort.

5. Human Communities

Potentially low positive impacts would be expected compared to the no-action alternative. Since internet access is pervasive in the Mid-Atlantic and New England, either vessel owners or their representative should be able to make an internet-based confirmation of dealer transactions records without substantial cost. Ensuring dealer records are accurate could help vessels if dealer records are used in the future for access controls/requalification. It is estimated that the online checking process would take about 5-10 minutes for each vessel per week and about 15 minutes per week for dealers to confirm and report that vessels had checked their landings. Some industry members have voiced concern that this puts vessels in a potentially awkward position of checking up on their customers, which could make business relationships more difficult to build and maintain.

2c. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded but there is no indication that any quota overages have occurred recently. If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species (including for RH/S. If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Economic impacts would likely be varied among dealers. Some dealers currently weigh all

landings in some manner and impacts for them would be negligible. While a complete survey of all dealers is not available, discussions with NMFS port agents and MSB Advisory Panel members suggest that around half of the 107 dealers who purchased at least 10,000 pounds of mackerel or longfin squid 2006-2010 currently weigh their purchases, including many of the highest volume dealers. So around 54 dealers with substantial purchases would need to alter their practices, including potentially purchasing scales. Smaller dealers also are mixed in terms of weighing MSB purchases, but at smaller quantities relatively inexpensive scales should suffice.

The cost of scales can vary dramatically. The use of an already existing truck scale can cost as little as $10, but the distance to reach one may make their use impracticable. 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 use trucks in the transport of fish however, and water weight can impact the accuracy of measurements. Floor scales handling up to 20,000 pounds cost $3,000-$5,000 while floor scales that can weigh up to 100,000 pounds cost $13,000-$17,000. 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. Smaller scales costing several hundred dollars may be purchased but may mean that additional time is required to batch-weigh a product.

Requiring dealers to documents how they estimate the relative compositions of a mixed catch in the annual dealer application should have negligible impacts.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

2d. Require that federally permitted MSB dealers weigh all landings related to mackerel transactions over 20,000 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded but there is no indication that any quota overages have occurred recently. If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species (including for RH/S). If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be negligible. While a complete survey of all dealers is not available, discussions with NMFS port agents and MSB Advisory Panel members suggest that around half of the 107 dealers who purchased at least 10,000 pound of mackerel or longfin squid 2006-2010 currently weigh their purchases, including many of the highest volume dealers. So around 54 dealers with substantial purchases would need to alter their practices, including potentially purchasing scales. Smaller dealers also are mixed in terms of weighing MSB purchases, but at smaller quantities relatively inexpensive scales should suffice.

The cost of scales can vary dramatically. The use of an already existing truck scale can cost as little as $10, but the distance to reach one may make their use impracticable. 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 use trucks in the transport of fish however, and water weight can impact the accuracy of measurements. Floor scales handling up to 20,000 pounds cost $3,000-$5,000 while floor scales that can weigh up to 100,000 pounds cost $13,000-$17,000. 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. Smaller scales costing several hundred dollars may be purchased but may mean that additional time is required to batch-weigh a product.

This alternative would also require documenting how the relative composition of a mixed catch is determined for each transaction, which could require 2-3 minutes for each transaction. From 2006-2010, 25 dealers averaged 14 mackerel transactions a year over 20,000 pounds, though some made only a few and others made much more than the average.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

2e. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded but there is no indication that any quota overages have occurred recently. If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species (including for RH/S). If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be negligible. While a complete survey of all dealers is not available, discussions with NMFS port agents and MSB Advisory Panel members suggest that around half of the 107 dealers who purchased at least 10,000 pound of mackerel or longfin squid 2006-2010 currently weigh their purchases, including many of the highest volume dealers. So around 54 dealers with substantial purchases would need to alter their practices, including potentially purchasing scales. Smaller dealers also are mixed in terms of weighing MSB purchases, but at smaller quantities relatively inexpensive scales should suffice.

The cost of scales can vary dramatically. The use of an already existing truck scale can cost as little as $10, but the distance to reach one may make their use impracticable. 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 use trucks in the transport of fish however, and water weight can impact the accuracy of measurements. Floor scales handling up to 20,000 pounds cost $3,000-$5,000 while floor scales that can weigh up to 100,000 pounds cost $13,000-$17,000. 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. Smaller scales costing several hundred dollars may be purchased but may mean that additional time is required to batch-weigh a product.

Requiring dealers to documents how they estimate the relative compositions of a mixed catch in the annual dealer application should have negligible impacts.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

2f. Require that federally permitted MSB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimate relative compositions of a mixed catch. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded but there is no indication that any quota overages have occurred recently. If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Accurate landings data is important to ensure that quotas are not exceeded. To the extent that landings data informs mortality caps, accurate landings data can also be important for managing catch of non-target species (including for RH/S). If dealers estimate the relative compositions of mixed catches consistently throughout the year then annual documentation of their methods should provide good information on their procedures. If dealers estimate the relative compositions of mixed catches differently throughout the year then transaction by transaction documentation of their methods would provide good information on their procedures. Getting good information of these procedures would help evaluate the accuracy of landings data (for managed or non-target species).

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring dealers to weigh all catches would not be expected to change effort.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Economic impacts would likely be varied among dealers. Some dealers currently weigh all landings in some manner and impacts for them would be negligible. While a complete survey of all dealers is not available, discussions with NMFS port agents and MSB Advisory Panel members suggest that around half of the 107 dealers who purchased at least 10,000 pound of mackerel or longfin squid 2006-2010 currently weigh their purchases, including many of the highest volume dealers. So around 54 dealers with substantial purchases would need to alter their practices, including potentially purchasing scales. Smaller dealers also are mixed in terms of weighing MSB purchases, but at smaller quantities relatively inexpensive scales should suffice.

The cost of scales can vary dramatically. The use of an already existing truck scale can cost as little as $10, but the distance to reach one may make their use impracticable. 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 use trucks in the transport of fish however, and water weight can impact the accuracy of measurements. Floor scales handling up to 20,000 pounds cost $3,000-$5,000 while floor scales that can weigh up to 100,000 pounds cost $13,000-$17,000. 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. Smaller scales costing several hundred dollars may be purchased but may mean that additional time is required to batch-weigh a product.

This alternative would also require documenting how the relative composition of a mixed catch is determined for each transaction, which could require 2-3 minutes for each transaction. From 2006-2010, 68 dealers averaged 25 longfin squid transactions over 2,500 pounds a year, though some made only a few and others made much more than the average.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

<u>2g</u>. Related to preferred requirements to weigh all fish (2d, 2f), allow dealers to use volume to weight conversions if they cannot weigh landings – they would need to identify their conversion methods in their dealer application and explain why they cannot weigh all landings. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Accurate monitoring is important to ensure quotas are not exceeded (directed or unintended) and avoid overfishing. Volume to weight conversions can be very accurate but are probably less accurate then weighing all fish. This alternative would only be selected if at least one alternative from 2c-2f were also chosen. Selecting this alternative in addition to 2c-2f likely renders each of those alternatives equivalent to the status quo, since dealers are probably unlikely to change the way they operate without a requirement to do so. The only required change would be the requirements to describe/document how dealers determine compositions of mixed landings. The impacts of documenting how dealers describe/document mixed landings compositions are discussed under each alternative 2c-2f above.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Accurate monitoring is important to ensure quotas are not exceeded (directed or unintended (including for RH/S)) and avoid overfishing. Volume to weight conversions can be very accurate but are probably less accurate then weighing all fish. This alternative would only be selected if at least one alternative from 2c-2f were also chosen. Selecting this alternative in addition to 2c-2f likely renders each of those alternatives equivalent to the status quo, since dealers are probably unlikely to change the way they operate without a requirement to do so. The only required change would be the requirements to describe/document how dealers determine compositions of mixed landings. The impacts of documenting how dealers describe/document mixed landings compositions are discussed under each alternative 2c-2f above.

3. Habitat Impacts Including EFH

Selecting this alternative in addition to 2c-2f likely renders each of those alternatives equivalent to the status quo, since dealers are probably unlikely to change the way they operate without a requirement to do so. The only required change would be the requirements to describe/document how dealers determine compositions of mixed landings. The impacts of documenting how dealers describe/document mixed landings compositions are discussed under each alternative 2c-2f above.

4. Protected Resources

Selecting this alternative in addition to 2c-2f likely renders each of those alternatives equivalent to the status quo, since dealers are probably unlikely to change the way they operate without a

requirement to do so. The only required change would be the requirements to describe/document how dealers determine compositions of mixed landings. The impacts of documenting how dealers describe/document mixed landings compositions are discussed under each alternative 2c-2f above.

5. Human Communities

Selecting this alternative in addition to 2c-2f likely renders each of those alternatives equivalent to the status quo, since dealers are probably unlikely to change the way they operate without a requirement to do so. The only required change would be the requirements to describe/document how dealers determine compositions of mixed landings. The impacts of documenting how dealers describe/document mixed landings compositions are discussed under each alternative 2c-2f above.

Alternative Set 2 Summary - Additional Dealer Reporting Measures

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

All of the action alternatives are expected to have some low incremental managed-resource benefits related to better monitoring with the exception of 2g. 2g would essentially provide a loophole for weighing all catch, which is what is primarily considered in this Alternative Set.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

All of the action alternatives are expected to have some low incremental non-target benefits related to better monitoring with the exception of 2g. 2g would essentially provide a loophole for weighing all catch, which is what is primarily considered in this Alternative Set.

3. Habitat Impacts Including EFH

None of the action alternatives are expected to impact habitat.

4. Protected Resources

None of the action alternatives are expected to impact protected resources.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial dealers could incur moderate-to-higher additional costs if they needed to buy high volume scales to meet the "weigh all fish" requirements considered in this alternative set. Many dealers already weigh all of their catch however. The interested public would benefit to a modest degree primarily to the extent that better monitoring could lead to better RH/S management.

7.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures

Statement of Problem/Need for Action:

The current suite of observer monitoring requirements may be insufficient to precisely estimate RH/S catch.

Background:

The measures in this Alternative Set would (alone and/or in combination with other alternatives) facilitate more accurate monitoring by observers with the overall goal of improving the precision of RH/S catch estimates. Each alternative addresses an aspect of observer coverage that potentially could be improved to ultimately lead to better RH/S estimates. Many of the alternatives deal with slippage, which is defined and described in Section 5.3.2.

NOTE ON COMBINATIONS: Many of the Alternative Set 3 action alternatives could be implemented individually or collectively. However, 3h (trip termination after 1 slipped haul) and 3i (trip termination after 2 slipped hauls) would be mutually exclusive – only one would be chosen if either. Likewise, 3k (fishery-wide slippage cap at 5 mackerel slippage events) and 3l (fishery-wide slippage cap at 10 mackerel slippage events) would be mutually exclusive – only one would be chosen if either. 3m (fishery-wide slippage cap at 5 longfin slippage events) and 3n (fishery-wide slippage cap at 10 longfin slippage events) are also mutually exclusive – only one would be chosen if either. 3p would replace fishery-wide slippage caps with vessel slippage caps and it would be expected that either 3p could be chosen or 3k-3n could be chosen (if any). Also, if 3j (slippage prohibition with exceptions) was chosen then 3f or 3g could not be selected (3f and 3g require all catch to be brought aboard but 3j provides some exceptions).

If alternatives 3f – 3p are selected for mackerel, they would also require the selection of Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

Several alternatives in this Alternative set deal with slippage. As described in Section 5.3, even infrequent slippage has the potential to bias observer data in that the observed data would represent a subset of actual fishing behavior that does not include the discards related to slippage. From 2006-2010 approximately 9% (383 of 4186 or 77 per year) of hauls on observed longfin squid trips (trips that caught 50% or more longfin squid or at least 10,000 pounds longfin squid) and 26% (73 of 277 or 15 per year) of hauls on observed mackerel trips (trips that caught 50% or more mackerel or at least 100,000 pounds mackerel) had some unobserved catch. Catch may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, or haul slipped (dumped) in the water. The above numbers would thus be an upper bound on slippage events.

If the ratios described above hold and higher observer coverages rates are implemented for any of these fisheries, the number of unobserved hauls could be much higher. Recent observer rates have been around 5%-10%.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

3a. No-action

If this alternative is selected, then no measures from Alternative Set 3 would be implemented and the existing monitoring measures (as described in section 5.3) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 3 (assisting observers, haul-back notice, dual coverage on pair trawl operations, and minimizing slippage) could improve monitoring of discards of the managed resources there would be some foregone benefits if the no-action alternative is chosen, especially for butterfish since discards account for a large portion of butterfish mortality. Quality observer data is critical for evaluating and implementing potential measures to minimize discards. Since to some degree observer assistance, haul-back notice, and dual coverage on pair trawl operations already occur, and discards are not substantial for mackerel, *Illex*, or longfin squid, the potentially forgone benefits (better observer data) are likely low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 3 (assisting observers, dual coverage on pair trawl operations, and minimizing slippage) would improve at-sea monitoring, there would be foregone benefits to non-target species including RH/S if the no-action alternative is chosen because less information on the catch and discards of those species would be available for future management decisions. Quality observer data is critical for evaluating and implementing potential measures to minimize discards. To some degree observer assistance, haul-back notice, and dual coverage on pair trawl operations already occur so the forgone benefits (better observer data) related to any one of those may be small but collectively such measures could provide higher benefits. If the no-action is selected, those benefits would be forgone. Regarding the issue of slippage (dumping net contents prior to observation), while a small percentage of hauls are currently slipped under the status quo, if the hauls that are slipped contain relevant non-target species, the understanding of interactions with non-target species will be biased.

While information on slippage is hard to come by, there is information on unobserved catch based on analysis described in section 6.3. The analyzed observed mackerel trips included 12 on average for each year 2006- 2010 and 26% (about 15/year) had hauls with unobserved catch. The analyzed observed longfin trips included 83 on average for each year 2006-2010 and 9% (about 75/year) had hauls with unobserved catch. Hauls may be unobserved for a variety of

reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc. While the number of true slippages on observed vessels is likely low, the concern is that a relatively low number of events could bias the observer data.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the action alternatives. At-sea observing is not expected to impact habitat.

4. Protected Resources

A low negative impact would be expected compared to the action alternatives. While at-sea observing is important for determining protected resources interactions, the action alternatives being considered are mostly specific to improving data collection on RH/S and should not substantively impact protected resources. Some benefits from generally assisting observers (observers could focus on technical aspects of documenting protected resource interactions) might be foregone but to some degree observer assistance, haul-back notice, and dual coverage on pair trawl operations already occur so the forgone benefits (better observer data) would be low, especially since the measures are not geared toward protected resources.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants of the additional monitoring requirements would be avoided, which is a positive impact. These avoided costs include the time required for vessel representatives to assist observers (3b, 3c), time required to complete slippage/released catch affidavits and possible postage cost for submitting the affidavits to NMFS (3e, 3j), revenue loss associated with trip termination due to slippage events (3h, 3i, 3k-3p), and the potential safety issues that may occur if vessels haul catch aboard in unsafe conditions rather than slip a catch related to safety concerns (3f-3p). Since to some degree observer assistance, haul-back notice, and dual coverage on pair trawl operations already occur, costs related to these measures should be low.

On the other hand, to the extent that Alternative Set 3 alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits.

These could include lost commercial revenues, lost recreational opportunities, lost cultural values for RH/S, and/or other lost non-market existence values (i.e. value related to the knowledge that these species are being conserved successfully) resulting from diminished stocks compared to optimally productive stocks. Due to the uncertainty about how the mackerel and longfin squid fisheries are impacting either the managed species or RH/S, these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3b. Require the following reasonable assistance measures: provision of a safe sampling station; help with measuring decks, codends, and holding bins; help with fish collection; and help with basket sample collection by crew on vessels with mackerel limited access and/or longfin squid/Butterfish moratorium permits. Requirements can be modified via the annual specifications process.
(PREFERRED)

Note: Vessel crews often assist with these tasks already.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Such assistance could help improve observer data by allowing the observer to focus on technical aspects of observing such as species identification, weighing, measuring, etc. To the degree that such data is used to better minimize and/or account for discards (good accounting for discards can help avoid overfishing), there could be positive impacts to the managed species. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Such assistance could help improve observer data by allowing the observer to focus on technical aspects of observing such as species identification, weighing, measuring, etc. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring vessels to provide the specified assistance would not be expected to change effort.

4. Protected Resources

A low positive impact would be expected compared to the no-action alternative. Such assistance could help improve observer data by allowing the observer to focus on technical aspects of observing such as species identification, weighing, measuring, etc. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

5. Human Communities

Neutral or negligible impacts would be expected compared to the no-action alternative. Many vessels provide this kind of assistance already and it would not be expected to be a major impact for those that do not. It is expected negligible crew time would be involved.

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. Requirements can be modified via the annual specifications process. (PREFERRED)

Note: Vessel crews often assist with these tasks already.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Such assistance in not missing hauls ensures that all catch from an observed trip is observed and sampled to determine discards. To the degree that such data is used to better minimize and/or account for discards (good accounting for discards can help avoid overfishing), there could be positive impacts to the managed species. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. Such assistance in not missing hauls ensures that all catch from an observed trip is observed and sampled to determine non-target interactions. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Ensuring that observers do not miss hauls is unlikely to change effort levels.

4. Protected Resources

A low positive impact would be expected compared to the no-action alternative. Such assistance in not missing hauls ensures that all catch from an observed trip is observed and sampled to determine protected resource interactions. To the degree that such data is used to better minimize protected resource interactions, there could be positive impacts. Impacts are low because many vessels already provide this kind of assistance, but codifying this requirement will help observers with vessels that are not as cooperative.

5. Human Communities

Neutral or negligible impacts would be expected compared to the no-action alternative. Many vessels provide this kind of assistance already and it would not be expected to be a major impact for those that do not. It is expected negligible crew time would be involved.

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. Requirements can be modified via the annual specifications process.
(PREFERRED)

Note: The observer program usually does this already.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. Not missing hauls ensures that all catch from an observed trip is observed and sampled to determine discards. To the degree that such data is used to better minimize and/or account for discards (good accounting for discards can help avoid overfishing), there could be positive impacts to the managed species. Impacts are low because the observer program usually does this already.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. If both vessels are receiving fish, having observers on both vessels ensures that all catch from the pair trawling trip is observed and sampled to determine non-target interactions. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. While the observer program typically assigns two observers to pair trawling operations (pers Com Amy VanAtten), this alternative provides the observer program with an additional incentive to do so. Impacts are low because the observer program usually does this already.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring the observer program to deploy observes on both vessels during pair trawl operations whenever possible would not be expected to change effort.

4. Protected Resources

A low positive impact would be expected compared to the no-action alternative. If both vessels are receiving fish, having observers on both vessels ensures that all catch from the pair trawling trip is observed and sampled to determine protected resource interactions. To the degree that such data is used to better minimize interactions, there could be positive impacts. Impacts are low because the observer program usually does this already.

5. Human Communities

Neutral or negligible impacts would be expected compared to the no-action alternative. Many paired vessels take observers out on both vessels already and this alternative does not have any observer funding requirements.

3e. On vessels with mackerel limited access and/or longfin squid moratorium permits, require slippage reports - "Released Catch Affidavits" from captains on observed trips if they slip a haul.

Selected alone, this alternative provides another account of slippage but does not do anything to deter slippage. This alternative would be used to augment and cross check the data collected by observers to develop a better understanding of slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. This alternative would be used to improve the quality of data collected by observers by developing a better understanding of slippage events. To the degree that such data is used in the future to reduce slippage and gain better information on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. This alternative would be used to improve the quality of data collected by observers by developing a better

understanding of slippage events. To the degree that such data is used in the future to reduce slippage and gain better information on non-target interactions (including for RH/S), there could be positive impacts to the non-target species if interactions are later reduced based on that information.

If a "trip termination because of slippage" alternative was selected (see below), the slippage reports could also be used by enforcement to determine if vessels had terminated appropriately after reaching the trigger number of slippage events. Minimizing slippage should result in better data for non-target species.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Ensuring that observers do not miss hauls is unlikely to change effort levels.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. There is no indication that protected resource interactions are being missed because of discards that are not brought aboard a vessel but theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions.

5. Human Communities

Neutral or negligible impacts would be expected compared to the no-action alternative. Vessel captains would have to fill out a form explaining the reason for any slipped hauls, which appear to be relatively infrequent compared to the total number of observed hauls. The slipped haul form should take around 5 minutes to complete for each slippage event.

3f. Prohibit vessels with Mackerel limited access permits that have notified for a mackerel trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. To the degree that such data is used in the future to gain better information on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since discards of managed species on mackerel trips is not a major issue, impacts should be low. While many vessels already do this, codifying this requirement will help observers with vessels that are not as cooperative.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would be used to improve the quality of data collected by observers by requiring all fish that will be discarded be brought aboard for sampling first to develop complete information about all species in the mackerel fishery. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. While many vessels already do this, codifying this requirement will help observers with vessels that are not as cooperative. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation would not be expected to change effort and there is no indication that protected resource interactions are being missed because of discards that are not brought aboard a vessel but theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Some fishing time may be lost because nets have to be fully brought aboard after each haul. Also, this alternative could create safety problems if a vessel attempts to bring aboard a catch and/or net in dangerous conditions. The observer program reports that most vessels are already bringing all hauls aboard for sampling a majority of the time on a voluntary basis however.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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3g. Prohibit vessels with longfin squid moratorium permits that have notified for a longfin squid trip and are carrying an observer from releasing any discards before they have been brought aboard for sampling by the observer.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that such data is used in the future to gain better information on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards are a major portion of butterfish mortality better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would be used to improve the quality of data collected by observers by requiring all fish that will be discarded be brought aboard for sampling first to develop complete information about all species in the longfin squid fishery. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. While many vessels already do this, codifying this requirement will help observers with vessels that are not as cooperative. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation would not be expected to change effort and there is no indication that protected resource interactions are currently being missed because of discards that are not brought aboard a vessel but theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. Some fishing time may be lost because nets have to be fully brought aboard after each haul. Also, this alternative could create safety problems if a vessel attempts to bring aboard a catch and/or net in dangerous conditions. The observer program reports that most vessels are already bringing all hauls aboard for sampling a majority of the time on a voluntary basis however.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3h. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 1 slipped haul on an observed trip so as to minimize slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards are a major portion of butterfish mortality, better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip any hauls on an observed trip so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Given that many non-target species interaction events are rare and large,

even infrequent slippage could confound catch estimates made without observing all hauls. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Even if some trip terminations occur, it is not expected that these would substantially change overall fishery effort especially since fishery participants may compensate by scheduling additional trips later. It would not matter if trips were terminated because of 1 or 2 slipped hauls because effort would not be expected to substantially change in either case so there are no habitat impacts.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Even if some trip terminations occur, it is not expected that these would substantially change overall fishery effort especially since fishery participants may compensate by scheduling additional trips later. It would not matter if trips were terminated because of 1 or 2 slipped hauls because effort would not be expected to substantially change in either case so there are no protected resources impacts. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. However, analysis described above

concluded that the mackerel fishery averages 15 hauls a year with unobserved catch, which could theoretically trigger trip terminations. The same analysis found that the longfin squid fishery averaged 77 hauls per year with unobserved catch, which could trigger trip terminations. Due to the nature of the analysis these numbers would be upper bounds. Compared to 3i, this alternative would be expected to be more negative since 1 slipped haul would result in trip termination rather than 2 slipped hauls.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3i. On vessels with mackerel limited access and/or longfin squid moratorium permits, require trip termination following 2 slipped hauls on an observed trip so as to minimize slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards are a major portion of butterfish mortality, better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events by requiring a vessel to terminate a trip if they slip any hauls on an observed trip so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite

large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Even if some trip terminations occur, it is not expected that these would substantially change overall fishery effort especially since fishery participants may compensate by scheduling additional trips later. It would not matter if trips were terminated because of 1 or 2 slipped hauls because effort would not be expected to substantially change in either case so there are no habitat impacts.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Even if some trip terminations occur, it is not expected that these would substantially change overall fishery effort especially since fishery participants may compensate by scheduling additional trips later. It would not matter if trips were terminated because of 1 or 2 slipped hauls because effort would not be expected to substantially change in either case so there are no protected resource impacts. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. However, analysis described above concluded that the mackerel fishery averages 15 hauls a year with unobserved catch, which could theoretically trigger trip terminations. The same analysis found that the longfin squid fishery averaged 77 hauls per year with unobserved catch, which could trigger trip terminations. Due to

the nature of the analysis these numbers would be upper bounds. Compared to 3h, this alternative would be expected to be less negative since 2 slipped hauls would result in trip termination rather than 1 slipped haul.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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3j. With the exceptions noted below, mackerel limited access and/or longfin squid moratorium permitted vessels that have notified the observer program of their intent to land over 2,500 pounds of longfin squid or over 20,000 pounds of mackerel and have been selected to carry an observer would be required to pump/haul 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. Vessels would be prohibited from releasing fish from the net (slippage), 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.

Exceptions: 1) pumping the catch could compromise the safety of the vessel/crew
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 a net is released, including the exemptions 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. Released Catch Affidavits must be submitted within 48 hours of completion of the trip. Exemptions and provisions of this measure can be modified via the annual specifications process.

(PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards are a major portion of butterfish mortality better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be

some additional mortality on a haul by haul basis. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation or requiring released catch affidavits would not be expected to change effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Prohibiting discarding before observation would not be expected to change effort and there is no indication that protected resource interactions are currently being missed because of discards that are not brought aboard a vessel. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a low negative impact would be expected compared to the no-action alternative. Vessel captains would have to fill out a form explaining the reason for any slipped hauls, which should take less than 5 minutes. Also, if slipping has been occurring frequently on observed trips for reasons other than the exceptions above then fishing time could be lost while net contents are brought aboard. Analysis described above concluded that the mackerel fishery averages 15 hauls a year with unobserved catch, which could theoretically trigger trip terminations. The same analysis found that the longfin squid fishery averaged 77 hauls per year with unobserved catch, which could trigger trip terminations. Due to the nature of the analysis these numbers would be upper bounds.

If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated.

However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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3k. Related to 3j, for mackerel limited access permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 fleet-wide for the rest of that year. The goal is to minimize slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Impacts would be greater than 3l which has a higher cap before terminations are triggered. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Analysis described above concluded that the mackerel fishery averages 15 hauls a year with unobserved catch, which could theoretically trigger trip terminations. Due to the nature of the analysis this number would be an upper bounds.

Compared to 3l, this alternative would be expected to be more negative since fewer slipped hauls could occur before additional slippages would result in future trip terminations. Note: once the slippage cap was achieved, any vessel with an additional slippage would have to terminate even if it had never slipped before in that year.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3l. Related to 3j, 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 fleet-wide for the rest of that year. The goal is to minimize slippage events. The only slippages that would count against the cap are non-emergency events, so the exceptions 1, 2, and 3 in 3j would not count against the slippage cap. Operational discards (small quantities of fish that remain in the net) that are made available to the observer for visual access prior to discarding would also not count against the slippage cap. Requirements and provisions of the measure can be modified via the annual specifications process.
(PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low. Since this alternative would be less restrictive than 3k, benefits would be less as well.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Impacts would be less than 3k which has a lower cap before terminations are triggered. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. Since this alternative would be less restrictive than 3k, benefits would be less as well. The modification to not count operational discards that have been made visible to the observer should not change the effect of the measure since such operational discards are small and the observer could confirm they are small. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Analysis described above concluded that the mackerel fishery averages 15 hauls a year with unobserved catch, which could theoretically trigger trip terminations. Due to the nature of the analysis this number would be an upper bounds.

Compared to 3k, this alternative would be expected to be less negative since more slipped hauls could occur before additional slippages would result in future trip terminations. Note: once the slippage cap was achieved, any vessel with an additional slippage would have to terminate even if it had never slipped before in that year.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3m. Related to 3j, for longfin squid moratorium permitted vessels, NMFS would track the number of slippage events. Once a cap of 5 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 minimize slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards in the longfin squid fishery are a major portion of butterfish mortality better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Impacts would be greater than 3n which has a higher cap before terminations are triggered. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in

terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Analysis described above concluded that the longfin squid fishery averaged 77 hauls per year with unobserved catch, which could trigger trip terminations. Due to the nature of the analysis these numbers would be upper bounds.

Compared to 3n, this alternative would be expected to be more negative since fewer slipped hauls could occur before additional slippages would result in future trip terminations. Note: once the slippage cap was achieved, any vessel with an additional slippage would have to terminate even if it had never slipped before in that trimester.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

3n. Related to 3j, 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 minimize slippage events.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. To the degree that this alternative minimizes slippage and increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards in the longfin squid fishery are a major portion of butterfish mortality better discard information has a strong potential to improve data and management. Since this alternative would be less restrictive than 3m, benefits would be less as well.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Impacts would be less than 3m which has a lower cap before terminations are triggered. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. Since this alternative would be less restrictive than 3m, benefits would be less as well. While absolute numbers of slippage events are likely low, partly that could be just because of low observer coverage rates and the key point is that individual hauls on MSB trips can be quite large (more than 100,000 pounds per haul for mackerel and more than 20,000 per haul for longfin squid) so it doesn't take more than a few slipped hauls to potentially have a strong impact on overall catch estimates.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in

terminations of some observed trips. This would apply if the trigger was either 5 or 10 trips. Theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. It is difficult to quantify the socio-economic impacts because participants are likely to have a wide variety of responses. Some vessels may just not slip where they would have previously, and the only extra cost is time for extra sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative. Analysis described above concluded that the longfin squid fishery averaged 77 hauls per year with unobserved catch, which could trigger trip terminations. Due to the nature of the analysis these numbers would be upper bounds.

Compared to 3m, this alternative would be expected to be less negative since more slipped hauls could occur before additional slippages would result in future trip terminations. Note: once the slippage cap was achieved, any vessel with an additional slippage would have to terminate even if it had never slipped before in that trimester.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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 (3g, 3h, 3k-3n), then the relevant vessel would have to take an observer on its next trip.

The idea behind this alternative is that vessels may seek to have trips terminated at the start of a trip to avoid having to take observers for extended trips. If such strategic behavior became widespread, it would likely bias the data compared to typical fleet behavior.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A low positive impact would be expected compared to the no-action alternative. To the degree that this alternative improves data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards in the longfin squid fishery are a major portion of butterfish mortality better discard information has a strong potential to improve data and management. The impact is low because this may be a rare circumstance.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage observer avoidance strategies so that data can be obtained on the composition of typical trips. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls. The impact is low because this may be a rare circumstance.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would affect overall fishery effort.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would affect overall fishery effort.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. . Vessels may experience reduced revenue and/or higher costs due to waiting for another observer or due to paying for another observer (proposed to be $325/day) if an industry-funded observer program is in place.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

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<u>3p</u>. Allow mackerel and/or longfin squid permitted vessels to be assigned an annual quota (set during specifications) of slippage events related to 3j, specified annually. Once their slippage quota was reached, vessels would have to terminate an observed trip as well as upon any slippage event on subsequent observed trips for the remainder of the calendar year.

This alternative would be in place of the fleet-wide caps and the vessel caps would be specified at a later date. As such, potential benefits would occur in the future (versus 3k-3n which would be implemented sooner if selected) and be dependent on what level the cap was set at.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potential positive impact would be expected compared to the no-action alternative. To the degree that this alternative increases the quality of data on discards, there could be positive impacts to the managed species if discards are later reduced or better accounted for (good accounting for discards can help avoid overfishing) based on that information. Since both discards and uncertainty about discards are already accounted for during specifications setting, impacts should be low except for butterfish. Since discards in the longfin squid fishery are a major portion of butterfish mortality better discard information has a strong potential to improve data and management.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potential positive impact would be expected compared to the no-action alternative. This alternative would seek to discourage slippage events so that data can be obtained on the composition of all catches. To the degree that such data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since some fish that are released when slipped may survive but are unlikely to survive if hauled aboard there may be some additional mortality on a haul by haul basis. Given that many non-target species interaction events are rare and large, even infrequent slippage could confound catch estimates made without observing all hauls.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not expected that this alternative would substantially affect overall fishery effort even if it resulted in terminations of some observed trips. Theoretically, making sure all catch is observed could

lessen the chance of observers missing protected species interactions though this is not known to be a problem.

5. Human Communities

Compared to the no-action alternative, impacts appear mixed with uncertain net impacts.

On one hand a negative impact would be expected compared to the no-action alternative. If less than the specified slippage events occur the impacts may be negligible. Once terminations are triggered, some vessels may just not slip where they would have previously, and the only extra cost is sorting fish on deck. If slippage occurred previously because of safety issues and vessels now took higher risks to avoid trip termination then vessel/crew safety could be reduced. If vessels are forced to terminate then they would lose the value of catch they might have made on the rest of the trip. Since the vessel would have to return to port eventually, the cost is the forgone revenue on what would have been the rest of the trip. If termination occurs near what would have been the natural end of a trip the costs would be low. If termination occurs near the beginning on a trip then the costs could be high, but not knowable since the trip is terminated. However, when fishing is good, longfin landings can often exceed $30,000 per trip and mackerel landings can exceed $150,000 per trip.

Because of the impossibility of predicting fishery participant responses, the variety of trip types, and the impossibility of predicting when a slipped haul might occur, it is not possible to further quantify socio-economic impacts related to this alternative.

A low positive impact would be expected compared to 3k-m. The advantage of having the slippage quota be vessel based is that vessels have a direct incentive to minimize unnecessary slippage events to save their slippage quota for when they really need it (e.g. due to safety issues) and thereby avoid situations where subsequent slippage events result in forced trip terminations.

On the other hand, to the extent that this alternative led to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then this alternative might result in potentially positive long-term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

Alternative Set 3 Summary - Additional At-Sea Observation Optimization Measures

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Many of the action alternatives are expected to have some low incremental managed-resource benefits related to better observer data. Since the general operation of the observers is not known to be a major problem for most of the managed species, impacts are generally low. However, since discarding of butterfish in the longfin squid fishery is a major component of fishing mortality, measures to track, eliminate, or reduce slippage in the longfin squid fishery would be expected to result in relatively greater positive impacts (3g, 3h, 3i, 3j, 3m, 3n, and 3p).

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

The alternatives that generally result in assistance for observers to get their work done effectively (3b-3d) would likely result in low incremental benefits. Since slippage has the potential to bias observer data, the alternatives that track, eliminate, or reduce slippage would be expected to have relatively greater benefits related to data quality, and the ones that most reduce slippage would be expected to have the greatest positive impacts (3f, 3g, and 3h).

3. Habitat Impacts Including EFH

None of the action alternatives are expected to impact habitat.

4. Protected Resources

The alternatives that generally result in assistance for observers to get their work done effectively (3b-3d) would likely result in low incremental benefits. Regarding the alternatives that deal with slippage, there is no indication that protected resource interactions are currently being missed because of discards that are not brought aboard a vessel but theoretically, making sure all catch is observed could lessen the chance of observers missing protected species interactions.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. For commercial fishing, the alternatives involving generally assisting observers should have negligible impacts since most do it already. Slippage restrictions could cause trip terminations resulting in lost revenue or potential safety issues if vessels bring catch aboard in dangerous conditions. The stricter the restriction on slippage the greater the potential costs. The interested public would benefit to the extent that better monitoring could lead to better RH/S management.

7.4 Alternative Set 4 - Port-side and Other Sampling/Monitoring Measures

Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements are insufficient to precisely estimate RH/S catch.

Background:

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates.

From a practical standpoint, it is more efficient to subsample the landings of river herring and other non-target species when a herring/mackerel MWT vessel reaches the dock than when it is at sea. Discards that occur at sea of non-target species are easier to monitor than are the landed fractions that go into the hold due to the large volumes involved. Dockside sampling could have higher sampling rates to better characterize the species retained and an entire catch could be evaluated in one day or less as opposed to having a person at sea for multiple days. This option does not mean that at sea monitors are unnecessary – they are necessary to monitor discards. However, since most RH/S are retained (esp. for mackerel trips), portside sampling could increase sampling coverage with lower costs than at-sea observers.

The observer program has indicated that they would provide staff (1 person half to full time depending on level of sampling) to manage the selection of vessels and organization of data for port-side sampling.

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

4a. No-action

If this alternative is selected, then no measures from Alternative Set 4 would be implemented and the existing monitoring measures (as described in section 5.4) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Neutral or negligible impacts would be expected compared to the action alternatives. Portside monitoring of landings is designed to better estimate low concentrations of incidentally landed catch such as RH/S, and there is no indication that there are major monitoring issues with landings of any of the managed resources.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 4 would improve landings monitoring through portside sampling, and RH/S are sometimes mixed into directed species' landings, there would be foregone benefits to non-target species including RH/S if the no-action alternative is chosen because less information on the landings of those species would be available for future management decisions.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the action alternatives. Portside monitoring of landings is not expected to impact habitat.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the action alternatives. Portside monitoring of landings is not expected to impact protected resources.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be avoided, which is a positive impact.

On the other hand, to the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the

managed resources and/or RH/S, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits.

These could include lost commercial revenues, lost recreational opportunities, lost cultural values for RH/S, and/or other lost non-market existence values (i.e. value related to the knowledge that these species are being conserved successfully) resulting from diminished stocks compared to optimally productive stocks. Due to the uncertainty about how the mackerel and longfin squid fisheries are impacting either the managed species or RH/S, these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

4b. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for mackerel landings over 20,000 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay providers directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Neutral or negligible impacts would be expected compared to the no-action alternative. Portside monitoring of landings is designed to better estimate low concentrations of incidentally landed catch such as RH/S, and there is no indication that there are major monitoring issues with landings of any of the managed resources.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Positive impacts would be expected compared to the no-action alternative. To the degree that better incidental landings data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. While requiring industry to pay for portside monitoring may discourage effort, mackerel fishing primarily takes place with mid-water gear that should not substantially impact habitat.

4. Protected Resources

Potentially positive impacts would be expected compared to the no-action alternative. Requiring industry to pay for portside monitoring may discourage overall effort, leading to less protected resource interactions.

5. Human Communities

The impacts for human communities of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts.

On one hand there are negative impacts related to costs of paying for monitoring. Dockside monitors for groundfish cost $50-$70/hr. Different sized vessels would have different costs for offload monitoring due to different hold sizes and processor offload speeds, but a 6-14 hour offload from a 3-5 day trip would costs $300-$980 for dockside monitoring. Discussions with MSB Advisory Panel members suggested that 6-14 hours would be typical offload time for high volume trips but trips around the thresholds of 20,000 pounds of mackerel or 2,500 pounds of longfin squid would take much shorter and cost less to monitor.

This cost is low compared to at-sea sampling costs of $800/day (plus $400 in administrative costs) or $3,600-$6,000 for observer costs for a 3-5 day trip. If the Council required 25%, 50%, 75%, or 100% of trips to be monitored then participants could have to pay for approximately that percentage of their trips to be monitored unless additional funds are available. Some dockside monitoring is already being funded though academic grants but it is not certain that such funding is permanent.

Revenue information for different mackerel vessels/trips is available related to Alternative Set 5 (see Section 7.5) to compare against these costs. Unless vessels have to wait for a portside monitor, it is expected that sampling could occur while offloading is occurring and as such would not substantially change offload times.

On the other hand, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative in comparison to the no-action alternative might result in positive benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

4c. Require industry-funded 3rd party port-side landings sampling program (including total weight documentation) for longfin squid landings over 2,500 pounds. Required coverage levels would be specified annually during specifications. NEFSC would accredit samplers and manage the program/data. Vessels would contract directly with providers and pay provider directly. If selected, vessels would have to wait until their sampler arrived unless a waiver is obtained from the observer program.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Neutral or negligible impacts would be expected compared to the no-action alternative. Portside monitoring of landings is designed to better estimate low concentrations of incidentally landed catch such as RH/S, and there is no indication that there are major monitoring issues with landings of any of the managed resources.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Neutral or negligible impacts would be expected compared to the no-action alternative. Since on longfin squid trips much non-target catch and most RH/S caught on longfin squid trips are discarded rather than retained (see table 22), portside sampling is probably would not be an effective way to obtain RH/S catch information.

Also, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A potentially positive impact would be expected compared to the no-action alternative. Requiring industry to pay for portside monitoring may discourage effort, leading to less habitat impacts from bottom trawling.

4. Protected Resources

Potentially positive impacts would be expected compared to the no-action alternative. Requiring industry to pay for portside monitoring may discourage overall effort, leading to less protected resource interactions.

5. Human Communities

The impacts for human communities of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts.

On one hand there are negative impacts related to costs of paying for monitoring. Dockside monitors for groundfish cost $50-$70/hr. Different sized vessels would have different costs for offload monitoring due to different hold sizes and processor offload speeds, but a 6-14 hour offload from a 3-5 day trip would costs $300-$980 for dockside monitoring. Discussions with MSB Advisory Panel members suggested that 6-14 hours would be typical offload time for high volume trips but trips around the thresholds of 20,000 pounds of mackerel or 2,500 pounds of longfin squid would take much shorter and cost less to monitor.

This cost is low compared to at-sea sampling costs of $800/day (plus $400 in administrative costs) or $3,600-$6,000 for observer costs for a 3-5 day trip. If the Council required 25%, 50%, 75%, or 100% of trips to be monitored then participants would have to pay for approximately that percentage of their trips to be monitored unless additional funds are available. Some dockside monitoring is already being funded though academic grants but it is not certain that such funding is permanent.

Revenue information for different mackerel vessels/trips is available related to Alternative Set 5 (see section 7.5) to compare against these costs. Unless vessels have to wait for a sampler, it is expected that sampling could occur while offloading is occurring and as such would not substantially change offload times.

On the other hand, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative in comparison to the no-action alternative might result in positive benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

4d. Require volumetric vessel-hold certification for Tier 3 limited access mackerel permits and specify a volume to weight conversion.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Neutral or negligible impacts would be expected compared to the no-action alternative. Tier 3 mackerel permits are not expected to catch a major portion of the mackerel quota and there are no major problems reported with monitoring of the managed species for these vessels.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Potentially low positive impacts would be expected compared to the no-action alternative. This alternative could facilitate rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates. To the degree that better non-target catch data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Impacts are low because Tier 3 vessels are expected to catch only a small portion of the mackerel quota.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring hold certifications would not be expected to change effort and mackerel fishing primarily takes place with mid-water gear that should not substantially impact habitat.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring hold certifications would not be expected to change effort.

5. Human Communities

The impacts for human communities of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts.

Potentially negative impacts would be expected for the vessels expected to qualify for a Tier 3 mackerel permit (around 300). Informal contacts by council staff with several marine surveyors revealed that a fish hold measurements could run approximately $13.30-$40 per foot of vessel length, which could range from as low as $1,000 for a 75 foot vessel to as high as $6,000 for a 150 foot vessel, not including travel expenses. To the extent that surveys are already required for insurance purposes these costs may be already part of a vessels operating costs. Costs may be higher if a marine architect or naval engineer is used. Industry members have communicated to Council staff that, while some smaller vessels are configured in a way that could facilitate hold certifications (the refrigerated seawater or "tank" boats), many vessels that participate in a "fresh" product fishery are not configured in a way that facilitates a certification of a fixed hold capacity.

On the other hand, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative in comparison to the no-action alternative might result in positive benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

4e. Require volumetric vessel-hold certification for longfin squid moratorium permits and specify a volume to weight conversion.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

Neutral or negligible impacts would be expected compared to the no-action alternative. It is not believed that major problems exist with current monitoring of the managed species' landings.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Potentially positive impacts would be expected compared to the no-action alternative. This alternative could facilitate rapid catch weight estimates based on vessel volume for portside sampling, observer data hail weight estimates, and vessels' VTR kept-weight estimates.
To the degree that better non-target catch data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative.
Requiring hold certifications would not be expected to change effort and mackerel fishing primarily takes place with mid-water gear that should not substantially impact habitat.

4. Protected Resources

Neutral or negligible impacts would be expected compared to the no-action alternative. Requiring hold certifications would not be expected to change effort.

5. Human Communities

The impacts for human communities of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts.

Potentially negative impacts would be expected for the vessels with longfin squid moratorium permits (around 380, though some of these may have to get hold certifications related to mackerel regulations currently being implemented). Informal contacts by council staff with several marine surveyors revealed that a fish hold measurements could run approximately $13.30-$40 per foot of vessel length, which could range from as low as $1,000 for a 75 foot vessel to as high as $6,000 for a 150 foot vessel, not including travel expenses. Costs may be higher if a marine architect or naval engineer is used. To the extent that surveys are already required for insurance purposes these costs may be already part of a vessels operating costs.

Industry members have communicated to Council staff that, while some longfin squid vessels are configured in a way that could facilitate hold certifications (the refrigerated seawater or "tank" boats), many vessels that participate in a "fresh" product fishery are not configured in a way that facilitates a meaningful certification of a fixed hold capacity.

On the other hand, to the extent that this alternative leads to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of the managed resources and/or RH/S, then choosing this alternative in comparison to the no-action alternative might result in positive benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

4f. Within 6 months of the completion of the Sustainable Fisheries Coalition RH/S avoidance project (expected late 2013), the Council will meet to formally review the results and consider the appropriateness of developing a framework adjustment to implement any additional catch avoidance strategies that are suggested by the results of the Sustainable Fisheries Coalition avoidance project. (PREFERRED)

This would commit the Council to consider the findings from this project as they could apply to reducing the catch of RH/S in pelagic fisheries. Full details on this project are included in Appendix 7, but generally the project is testing if oceanographic and fishery data can be used to help industry avoid potential RH/S hotspots. Implementing measures similar to this project (i.e. making participation mandatory) would be a frameworkable action. No immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

Alternative Set 4 Summary - Port-side and Other Sampling/Monitoring Measures

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

All of the action alternatives are expected to have negligible impacts for managed species since it is believed that their landings are already generally well monitored.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Monitoring landings from mackerel trips (4b) would be expected to have the most benefit especially for RH/S since RH/S appear to often be retained by the mackerel fishery. Benefits are not as high with longfin squid trips (4c) since they discard more of their non-target catch. Hold certifications may help with some aspects of monitoring but may not be feasible for fresh-product boats that often reconfigure their holds.

3. Habitat Impacts Including EFH

None of the action alternatives are expected to directly impact habitat but if vessels had to pay for their monitoring that could reduce effort which would generally lower habitat impacts.

4. Protected Resources

None of the action alternatives are expected to directly impact protected resources but if vessels had to pay for their monitoring that could reduce effort which would generally lower protected resource interactions.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial participants could incur moderate to higher additional costs if they have to pay for dockside monitoring (but this is much less expensive than at-sea coverage). Hold certifications would involve low to moderate costs and would generally be a one-time or infrequent cost. The interested public would benefit to a modest degree primarily to the extent that better monitoring could lead to better RH/S management.

7.5 Alternative Set 5 – At-Sea Observer Coverage Requirements

Statement of Problem/Need for Action:

The current suite of reporting and monitoring requirements is insufficient to precisely estimate RH/S catch.

Background:

The measures in this Alternative Set would (alone and/or in combination with other alternatives) increase reporting and/or monitoring with the overall goal of improving the precision of RH/S catch estimates. The focus of these alternatives is on increasing the observer coverage rates of mackerel and longfin squid trips.

The average trip cost values cited in this analysis include variable costs such as fuel, oil, ice, food, fishing supplies, vessel/gear damages, and water but does not include crew shares/wages, dockage fees, or boat mortgage payments. Trip costs were estimated based on 2010 observer data. Observers ask for information on these costs and vessels were binned by gear, vessel size, and day versus multi-day vessels.

NOTE ON COMBINATIONS: Only one of the 5b (observer coverage for mackerel mid-water trawl) alternatives could be chosen. Likewise, only one of the 5c (observer coverage for mackerel small mesh bottom trawl) and one of the 5d (observer coverage for longfin squid small mesh bottom trawl) alternatives could be chosen. One alternative from each of these could be selected (a total of three). 5e1 and 5e2 (strata-fleet alternatives for mid-water trawl) are mutually exclusive as are 5e3 and 5e4 (strata-fleet alternatives for small mesh bottom trawl) but one alternative from the first pair could be chosen with one from the second pair. If any of the 5e alternatives were chosen, they would not be combinable with any of the 5b, 5c, or 5d alternatives (coverage could be based on a set percentage of trips or a set target coefficients of variation (C.V.s) but not both). 5f, 5g, and 5h provide for industry funding and review of the increased observer coverage levels proposed in 5b-5e so they could be added on to any of the other action alternatives.

If any measure in this Alternative Set is selected for mackerel, the Council would also need to select Alternative 1d48 (48-hr pre-trip notification) or 1d72 (72-hr pre-trip notification). There is already a pre-trip notification requirement in effect for longfin squid moratorium permit holders.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

5a. No-action

If this alternative is selected, then no measures from Alternative Set 5 would be implemented and the existing observer coverage procedures (as described in section 5.5) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A negative impact would be expected compared to the action alternatives. Since the alternatives in Alternative Set 5 would improve monitoring of discards of the managed resources there would be some foregone benefits if the no-action alternative is chosen. Since discarding of butterfish in the longfin squid fishery is the only major concern about discarding of the managed species, the forgone benefits would be primarily limited to butterfish and the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A negative impact would be expected compared to the action alternatives. Since the alternatives in Alternative Set 5 would improve at-sea catch monitoring, and RH/S are sometimes mixed into directed species' catch, there would be foregone benefits to non-target species including RH/S if the no-action alternative is chosen because less information on the catch of those species would be available for future management decisions.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the action alternatives. At-sea monitoring of catch is not expected to impact habitat.

4. Protected Resources

A negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 5 would improve at-sea catch monitoring, and protected resources are sometimes encountered in the mackerel and longfin squid fisheries, there would be foregone benefits to protected resources including RH/S if the no-action alternative is chosen because less information on the catch of those species would be available for future management decisions.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be avoided, which is a positive impact.

On the other hand, to the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits.

These could include lost commercial revenues, lost recreational opportunities, lost cultural values for RH/S, and/or other lost non-market existence values (i.e. value related to the knowledge that these species are being conserved successfully) resulting from diminished stocks compared to optimally productive stocks. Due to the uncertainty about how the mackerel and longfin squid fisheries are impacting either the managed species or RH/S, these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

5b. Mackerel MWT

Coverage of this fleet has historically primarily occurred because of the winter mixing of the herring and mackerel fisheries as opposed to focusing on the mackerel fishery. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation.

5b1. Require 25% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b2. Require 50% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b3. Require 75% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5b4. Recommend 100% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. Since alternatives in Alternative Set 5 would somewhat improve monitoring of discards of the managed resources there could be some benefits but given there are no major reported issues with discarding of the managed species in the mackerel fishery, impacts would be expected to be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. All of the proposed coverage rates are higher than current coverage rates (about 6.5 percent of mackerel catch was observed 2006-2010) and to the degree that additional data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since mackerel fishing only accounts for a portion of MWT activity, it is not possible to exactly specify how MWT catch estimate precision would change for these alternatives (which are specific to mackerel not all MWT) but it would improve. See section 5.5 for additional details on how RH estimate precision levels change based on coverage levels in the MWT fisheries. Also, at a constant trip coverage level as proposed in this alternative, incremental improvements to C.V.s would fluctuate from year to year (potentially substantially) due to changes in catch characteristics and effort rates. However since this alternative would implement higher coverage rates than are used currently, precision of non-target species catch estimates would be improved compared to the no-action alternative.

Based on the C.V. analysis in section 5.5 (which is for all MWT fishing), there are diminishing returns (better precision) for additional observer coverage. Thus gains (better precision) per dollar spent are greatest for going to 25% observer coverage and least going from 75% to 100%. However, as shown in figures 10-13 in Section 5.5, there are continued gains in precision (C.V.s get lower) throughout the range of trip coverages so there are still substantial gains in precision from moving from 75% to 100% even though it is a smaller gain compared to 25% to 50% or 50% to 75%. Thus moving to 25% or 50% or 75% from the status quo results in substantial precision improvements but the marginal benefit of going to 100% is less. These continued gains are related to the patchy nature of RH catch and the relatively small overall number of MWT trips. It is important to remember that the C.V. gains described in 5.5 would only be achieved if all MWT trips were subject to these coverage requirements and the gains in a given year from one coverage level to another vary by year due to the different RH catch rates from one year to another (compare figures 10 and 11 for example). Figures 10-13 also suggest that around a 65% coverage level may be necessary to achieve a C.V. of 0.3 for MWT for RH.

Precision gains to overall RH/S catch estimates in MWT fisheries may be limited if only the mackerel fishery is required to have higher observer coverage levels.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then effort could be discouraged but impacts would still be neutral or negligible because most mackerel are caught with mid-water gear that generally does not contact the bottom.

4. Protected Resources

Neutral or negligible direct impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then overall effort could be discouraged which could lead to positive impacts compared to the no-action alternative. Higher coverage would generate better data on protected resource interactions.

5. Human Communities

The impacts of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be a negative impact. The cost to vessels of at-sea observers would be $325 per day at sea. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, the following table allows comparisons of an $325/day observer cost with 2010 trip revenue (from dealer data) and cost information (from observer data) from observed mackerel trips defined as 50% mackerel or over 100,000 pounds mackerel regardless of percentage. This trip definition accounts for nearly all mackerel landings in a given year. These trips are generally large volume trips. Smaller trips, with lower daily revenues, would likely be more impacted by observer costs. 2010 MWT observer information from these trips was binned into three categories based on vessel performance from 2006-2010: a) single MWT that had at least 3 million pounds of mackerel in any one year 2006-2010; b) paired MWT that had at least 3 million pounds of mackerel in any one year 2006-2010; and c) paired MWT that had less than 3 million pounds of mackerel in any one year 2006-2010 but more than 500,000 pounds of mackerel in one year. All pair trawl data was combined which is why the costs are the same for higher and lower volume pair trawl vessels. While it appears strange that the lower-volume paired MWT had higher revenues than the higher volume paired MWT, this is just a chance outcome related to the groupings of vessels coming from VTR data 2006-2010 and the distribution of 2010 observer coverage of those same vessels in 2010. All together these vessels account for most mackerel landings.

Table 65. Mackerel Mid-Water Trawl Costs and Revenues

	Mid-Water Trawl (MWT) (more than 3 mil pounds/ year)	Paired MWT (more than 3 mil pounds/year)	Paired MWT (less than 3 mil pounds/year)
Average Days	2	4	2
Avg Revneue/Day	8,059	14,486	16,075
Ave Cost/Day	3,494	2,602	2,602

Based on this data, adding $325/day would increase trip costs by 9% for single MWT, and 12% for paired MWT trips.

Depending on which alternative one is considering, the observer costs would apply to 25%, 50%, 75%, or 100% of vessels trips. While over time one would expect roughly even distribution among vessels if a coverage level of less than 100% is selected, within a year some vessels may be randomly selected more often than others and bear a disproportionate share of the increased observer costs. Also, among these vessels both costs and revenue vary so some vessels may be disproportionately affected compared to other vessels.

The approximate cost for an observer is $800/day. In addition to these at-sea costs, NMFS has estimated that it incurs approximately $400/day in administrative costs related to each additional day at sea.

While the per trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on midwater trawl trips that kept 20,000 pounds or more of mackerel. These trips averaged 643 sea days each year ranging from 272 in 2010 to 926 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (643) were observed it would require 161, 322, 482, and 643 days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.05 million, $0.10 million, $0.16 million, and $0.21 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.06 million, $0.13 million, $0.19 million, and $0.26 million per year respectivly.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

5c. Mackerel SMBT

A very small percentage of mackerel trips are observed overall. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5c1. Require 25% of SMBT (3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c2. Require 50% of SMBT (3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c3. Require 75% of SMBT (3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

5c4. Recommend the following observer coverages percentages for mackerel limited access vessels intending to fish for or retain over 20,000 pounds of mackerel when using small mesh (<3.5 inches) bottom trawl gear: Tier 1: 100%; Tier 2: 50%; Tier 3: 25%. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel. (PREFERRED)

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. Since alternatives in Alternative Set 5 would somewhat improve monitoring of discards of the managed resources there could be some benefits but given there are no major reported issues with discarding of the managed species in the mackerel fishery, impacts would be expected to be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. All of the proposed coverage rates are higher than current coverage rates (about 6.5 percent of mackerel catch was observed 2006-2010) and to the degree that additional data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since mackerel fishing only accounts for a small portion of SMBT activity, it is not possible to exactly specify how SMBT catch estimate precision would change for these alternatives. Precision would improve but likely only by a small degree since mackerel trips only account for a small portion of all SMBT activity. See section 5.5 for additional details on how RH estimate precision levels change based on coverage levels in the SMBT fisheries. Also, at a constant trip coverage level as proposed in this alternative, incremental improvements to C.V.s would fluctuate from year to year (potentially substantially) due to changes in catch characteristics and effort rates. However since this alternative would implement higher coverage rates than are used currently, precision of non-target species catch estimates would be improved compared to the no-action alternative.

Based on the C.V. analysis in section 5.5 (which is for all SMBT fishing), there are diminishing returns (better precision) for additional observer coverage. Thus gains (better precision) per dollar spent are greatest for going to 25% observer coverage and least going from 75% to 100%. As shown in figures 14-17 in Section 5.5, there are continued gains in precision (C.V.s get lower) throughout the range of trip coverages so there are still some gains in precision from moving from 75% to 100%. The gains from 50% to 75% are minimal in some years while substantial in others while the gains going from 75% to 100% are generally quite small. Thus moving to 25% or 50% from the status quo results in substantial precision improvements but the marginal benefit of going to 75% or 100% is much less. It is important to remember that the C.V. gains described in 5.5 would only be achieved if all SMBT trips were subject to these coverage requirements and the gains in a given year from one coverage level to another vary by year due to the different RH catch rates from one year to another (compare figures 16 and 17 for example). Figures 14-17 also suggest that around a 40% coverage level may be necessary to achieve a C.V. of 0.3 for SMBT for river herring. Precision gains to overall RH/S catch estimates in SMBT fisheries may be limited if only the mackerel fishery is required to have higher observer coverage levels.

Since as discussed in Amendment 11, 90% or more of mackerel landings typically are made by Tier 1 vessels, the preferred alternative combined with 5b4 (100% observer coverage for all mid-water trawl fishing of mackerel) would likely result in about 90% or more of total mackerel catch being observed. Having some moderate coverage on the other vessels could be important because otherwise there could be an incentive to focus on using non Tier-1 vessels to avoid observer coverage requirements.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then effort could be discouraged but impacts would still be neutral or negligible because most mackerel are caught with mid-water gear that generally does not contact the bottom.

4. Protected Resources

Neutral or negligible direct impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then overall effort could be discouraged which could lead to positive impacts compared to the no-action alternative. Higher coverage would generate better data on protected resource interactions.

5. Human Communities

The impacts of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be a negative impact. The cost to vessels of at-sea observers would be $325 per day at sea. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, the following table allows comparisons of an $325/day observer cost with 2010 trip revenue (from dealer data) and cost information (from observer data) from mackerel trips (50% mackerel or over 100,000 pounds mackerel regardless of percentage) by bottom trawlers based on 2010 observer data. These trips are generally large volume trips and smaller trips, with lower revenues, would be more impacted by observer costs. The vessels that were examined were those that either had at least one year 2006-2010 with 3 million pounds of mackerel or those with at least 500,000 pounds in any one year.

Table 66. Mackerel SMBT Costs and Revenues

	Bottom Trawl (more than 3 million pounds per year)
Average Days	8
Avg Revneue/Day	12,945
Ave Cost/Day	1,639

Based on this data, adding $325/day would increase trip costs by 20% for bottom trawlers.

Depending on which alternative one is considering, the observer costs would apply to 25%, 50%, 75%, or 100% of vessels trips. While over time one would expect roughly even distribution among vessels (if 100% coverage is not selected), within a year some vessels may be randomly

selected more often than others and bear a disproportionate share of the increased observer costs. Also, among these vessels both costs and revenue vary so some vessels may be disproportionately affected compared to other vessels.

The approximate cost for an observer is $800/day. In addition to these at-sea costs, NMFS has estimated that it incurs approximately $400/day in administrative costs related to each additional day at sea.

While the per trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 20,000 pound mackerel trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on SMBT trips that kept 20,000 pounds or more of mackerel. These trips averaged 172 sea days each year ranging from 113 in 2009 to 286 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (172) were observed it would require 43, 86, 129, and 172 days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.01 million ($14,000), $0.03 million, $0.04 million, and $0.06 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.02 million, $0.03 million, $0.05 million, and $0.07 million per year respectivly.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

5d. Longfin Squid SMBT

While coverage has increased in 2011 related to the implementation of the butterfish mortality cap on the longfin squid fishery, a small percentage of longfin squid trips have been observed historically. The sub-alternatives below would require a range of percentage-based coverage levels to improve coverage from the very low levels currently occurring and improve catch estimation. Analysis in the document relates these coverage levels to potential ranges of uncertainty that would result from such coverage levels.

5d1. Require 25% of SMBT (3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d2. Require 50% of SMBT (3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d3. Require 75% of SMBT (3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

5d4. Require 100% of SMBT (3.5 in) longfin squid trips by federal vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A positive impact would be expected compared to the no-action alternative. Since alternatives in Alternative Set 5 would improve monitoring of discards in the longfin squid fishery, and butterfish are a major discard concern in the longfin squid fishery, there would likely be benefits for butterfish related to increased observer coverage and related improvements in information regarding butterfish discarding.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. All of the proposed coverage rates are higher than current coverage rates (about 3.5 percent of longfin squid catch was observed 2006-2010) and to the degree that additional data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. Since longfin squid fishing only accounts for a portion (though substantial) of SMBT activity, it is not possible to exactly specify how SMBT catch estimate precision would change for these alternatives but it would improve. See section 5.5 for additional details on how RH estimate precision levels change based on coverage levels in the SMBT fisheries. Also, at a constant trip coverage level as proposed in this alternative, incremental improvements to C.V.s would fluctuate from year to year (potentially substantially) due to changes in catch characteristics and effort rates. However since this alternative would implement higher coverage rates than are used currently, precision of non-target species catch estimates would be improved compared to the no-action alternative.

Based on the C.V. analysis in section 5.5 (which is for all SMBT fishing), there are diminishing returns (better precision) for additional observer coverage. Thus gains (better precision) per dollar spent are greatest for going to 25% observer coverage and least going from 75% to 100%. As shown in figures 14-17 in Section 5.5, there are continued gains in precision (C.V.s get lower) throughout the range of trip coverages so there are still some gains in precision from moving from 75% to 100%. The gains from 50% to 75% are minimal in some years while substantial in others while the gains going from 75% to 100% are generally quite small. Thus moving to 25% or 50% from the status quo results in substantial precision improvements but the marginal benefit of going to 75% or 100% is much less. It is important to remember that the C.V. gains described in 5.5 would only be achieved if all SMBT trips were subject to these coverage requirements and the gains in a given year from one coverage level to another vary by year due to the different RH catch rates from one year to another (compare figures 16 and 17 for example). Figures 14-17 also suggest that around a 40% coverage level may be necessary to achieve a C.V. of 0.3 for SMBT for river herring.

Targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3). Precision gains to overall RH/S catch estimates in SMBT fisheries may be limited if only the longfin squid fishery is required to have higher observer coverage levels.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then a potentially positive impact would be expected compared to the no-action alternative because having to pay for observers could discourage effort.

4. Protected Resources

Neutral or negligible direct impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then overall effort could be discouraged which could lead to positive impacts compared to the no-action alternative. Higher coverage would generate better data on protected resource interactions.

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5. Human Communities

The impacts of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be a negative impact. The cost to vessels of at-sea observers would be $325 per day at sea. Since different vessels have different average trip lengths and trip length varies by trip it is not possible to describe the impact on any given vessel. However, the following table allows comparisons of an $325/day observer cost with 2010 trip revenue (from dealer data) and cost information (from observer data) from 2010 observer data of longfin squid trips by vessels that had at least 100,000 pounds of longfin squid landings in at least one year from 2007-2010 (87% of total 2007-2010 landings) or those that had at least 20,000 pounds of longfin squid landings in at least one year 2007-2010 (9% of total landings). Since trips with 50% longfin squid also account for over 90% of longfin squid landings, these criteria was also used to identify the primary squid vessels' squid trips. Almost all of the longfin squid landings are associated with bottom trawl gear. 2007 was selected as a start year because in that year the fishery switched from quarterly quotas to trimester quotas.

Table 67. Longfin squid Trawl Costs and Revenues

Primary Vessels	100,000 + in one year 2007 - 2010
	Bottom Trawl
Average Days	2
Avg Revenue/Day	5,249
Avg cost/Day	939
Secondary Vessels	20,000 + in one year 2007-2010
	Bottom Trawl
Average Days	1
Avg Revenue/Day	1,700
Avg cost/Day	424

Based on this data, adding $325/day would increase trip costs by 35% for the primary bottom trawlers (about 98 vessels). For the secondary vessels however, adding $325/day would increase their costs by 77%.

Depending on which alternative one is considering, the observer costs would apply to 25%, 50%, 75%, or 100% of vessels trips. While over time one would expect roughly even distribution among vessels (assuming 100% coverage is not attained), within a year some vessels may be randomly selected more often than others and bear a disproportionate share of the increased

observer costs. Also, among these vessels both costs and revenue vary so some vessels may be disproportionately affected compared to other vessels.

The approximate cost for an observer is $800/day. In addition to at-sea costs, NMFS has estimated that it incurs approximately $400/day in administrative costs related to each additional day at sea.

While the per trip costs are most relevant to vessels, total costs can also be considered. Since coverage in this alternative would be related to 2,500 pound longfin squid trips, 2006-2010 VTR data was analyzed to determine the approximate number of seadays fished on SMBT trips that kept 2,500 pounds of more of longfin squid. These trips averaged 5,357 sea days each year ranging from 3,932 in 2010 to 6,743 in 2006. If 25%, 50%, 75%, or 100% of the average seadays (5,357) were observed it would require 1339, 2678, 4017, and 5,357 sea days respectivly. Multiplying these days by $325/day results in at-sea costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.4 million, $0.9 million, $1.3 million, and $1.7 million per year respectivly. Multiplying these days by $400/day results in administrative costs for 25%, 50%, 75%, or 100% coverage of the average seadays of approximatley $0.5 million, $1.1 million, $1.6 million, and $2.1 million per year respectivly. However, there may be returns to scale in the sense that at higher coverage levels NMFS marginal costs may become less than $400/day.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

5e. Strata-Fleet-Based Alternatives

On a fleet level, catch estimates of river herrings are often imprecise. The following sub-alternatives would require coverage levels that would be expected to result in the specified C.V. levels for river herrings. Shad were not included because very high coverage levels would be required to achieve the respective C.V.s due to even less frequent encounters with shads.

5e1. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.30.

5e2. Require NMFS to allocate sea days such that Mid-Atlantic alewife and blueback catch C.V.s for MWT would each be expected to be at or below 0.20.

5e3. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.30.

5e4. Require NMFS to allocate sea days such that alewife and blueback catch C.V.s for SMBT would each be expected to be at or below 0.20.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative for the MWT C.V. targets related to improved monitoring of discards of the managed resources, but given there are no major reported issues with discarding of the managed species by MWT gear, impacts would be expected to be low. A positive impact would be expected compared to the no-action alternative for the SMBT C.V. targets related to improved monitoring of butterfish discards since butterfish discards are a major concern in SMBT gear, especially when that gear is used to target longfin squid.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected compared to the no-action alternative. To the degree that better (more precise) data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. A C.V. of 0.30 means that the true value has approximately a 95% probability of being within ± 60% of the estimate. A C.V. of 0.20 means that the true value has approximately a 95% probability of being within ± 40% of the estimate (both assuming a normal distribution of data). Also, since some sources of uncertainty are not integrated into the C.V. calculations, the C.V.s generated by the science center are lower (look better) than they really are. As described above, since obtaining a given C.V. can require very different coverage levels from year to year, and the inter-annual variability in the data drives the precision, it may be quite difficult to consistently obtain precise catch estimates via observer data when the coverage levels are determined from prior years' data. Since 5b, 5c, and 5d require coverage based on directed trip definitions and not all activity in MWT and SMBT fishing is associated with the MSB trip definitions considered in 5b, 5c, and 5d, the two

alternatives are not directly comparable. One could require coverage levels in 5b, 5c, and 5d but still be very unsure of what the gear-based C.V. will be because of other fisheries that use the same gear (e.g. Atl herring for MWT and whiting for SMBT). However, this alternative (5e) may be thought of as more comprehensive since it encompasses all fishing activity to achieve a C.V. for a particular gear type. This raises implementation problems though, which are described below in the human community section.

3. Habitat Impacts Including EFH

Neutral or negligible impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then a potentially positive impact would be expected compared to the no-action alternative because having to pay for observers could discourage effort. These impacts would be focused on SMBT effort since MWT gear does not generally contact the bottom.

4. Protected Resources

Neutral or negligible direct impacts would be expected compared to the no-action alternative if vessels do not have to pay for observer coverage (which is considered in other alternatives). In this case overall effort should not be impacted. If vessels have to pay for observer coverage then overall effort could be discouraged which could lead to positive impacts compared to the no-action alternative. Higher coverage would generate better data on protected resource interactions.

5. Human Communities

The impacts of this alternative in comparison to the no-action alternative appear mixed with uncertain net impacts. On one hand the costs to fishery participants of paying for the additional monitoring requirements would be a negative impact. NMFS has stated that to be approved any increased observer coverage must be funded by industry. Table 11, reproduced from Section 5.5, details the sea days required for C.V. targets under consideration.

Table 67b. Sea days associated with Alt. 5e C.V. targets.

	Mid-Atlantic MWT (CV = 0.3)	Mid-Atlantic MWT (CV = 0.2)	SMBT (CV = 0.3)	SMBT (CV = 0.2)
Required Sea Days (2009)	541	751	3610	4889
Required Sea Days (2010)	308	409	2542	3982
Approx Days Provided in 2010	65		1132	

As with the figures above for the fishery-trip-based coverage levels, the number can fluctuate from year so one can never really guarantee a given C.V. will be reached. It may be quite difficult to consistently obtain precise catch estimates via observer data when the coverage levels are determined from prior years' data for species that are not encountered that often in consistent quantities. However, the numbers in the table above suggest that around 65% coverage could

result in a 0.3 C.V. goal and about 90% coverage could result in a 0.2 C.V. goal for Mid-Atlantic MWT and that for small mesh bottom trawl, around 40% coverage could result in a 0.3 C.V. goal and about 60% coverage could result in a 0.2 C.V. goal. This was determined by averaging the required sea days from 2009-2010, and then comparing those averages with total average days at sea for relevant trips from VTR data, 2009-2010. However it is emphasized that from year to year it will be very hard to hit a particular C.V. target due to the inherent variability from year to year in both the directed fisheries involved and their catch of river herrings. Since one cannot predict which years will require the highest coverage, some years would likely be over covered and some years would be under covered if coverage rates are determined by the previous year's data.

Compared to the approximate sea days provided in 2010, achieving a 0.3 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 232-476 extra sea days (costing about $0.2-$0.4 million) and achieving a 0.2 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 686-344 extra sea days (costing about $0.3-$0.5 million), with at sea costs being $800/day. Administrative costs to NMFS would equal an additional 50% of the at-sea costs ($400/day). The range is related to the fact that C.V.s vary from year to year related to variation in the underlying data.

Compared to the approximate sea days provided in 2010, achieving a 0.3 C.V. for both blueback herring and alewife in the SMBT (Mid-Atlantic and New England) would require 1,410-2,478 extra sea days (costing about $1.1-$2.0 million) and achieving a 0.2 C.V. for both blueback herring and alewife in the Mid-Atlantic for MWT would require 2,850-3,757 extra sea days (costing about $2.3-$3.0 million), with at sea costs being $800/day. Administrative costs to NMFS would equal an additional 50% of the at-sea costs ($400/day). The range is related to the fact that C.V.s vary from year to year related to variation in the underlying data.

A key issue with implementation of this alternative is that while the alternative is based on gear types which is how discard and catch estimates based on observer coverage are binned to get total estimates, the MAFMC can really only compel the fisheries it manages to carry and pay for observers. Since NMFS has indicated that it will only approve additional observer coverage on fisheries if it is funded by industry, and the MAFMC cannot compel fisheries out of its control to carry and pay for observers, there is a procedural tension inherent in this alternative.

What could occur if this alternative is selected, is that NMFS would use its observer allocation procedures to allocate the approximate level of coverage in the MSB fisheries (mackerel and longfin squid) that would be needed as part of achieving the overall C.V. targets. So if this alternative was recommended, New England fisheries that use the relevant gear types would not be affected so the C.V. targets would not actually be reached (but they would be improved related to increases in MSB fisheries). If New England approved measures consistent with these C.V. targets (including industry funding), the tension would be resolved however as all of the major fisheries with substantial RH catch would be covered.

The impact of adding observer costs on mackerel and longfin squid trips has already been described in alternatives 5b-5d. As discussed above, analysis suggests that around **65%** coverage could result in a 0.3 C.V. goal and about **90%** coverage could result in a 0.2 C.V. goal

for Mid-Atlantic MWT and that for small mesh bottom trawl, around **40%** coverage could result in a 0.3 C.V. goal and about **60%** coverage could result in a 0.2 C.V. goal. Analyses for alternatives 5b-5d above describe the total costs for 25%, 50%, 75%, or 100% coverage levels in MAFMC fisheries so approximate total costs for **65% and 90%** of MWT mackerel trips and **40% and 60%** of SMBT mackerel and longfin squid trips can be interpolated from the impact analysis above for 5b-5d.

As also detailed in 5b-5d and perhaps more important for understainding the impact of paying for observer cost, on a per day basis adding $325/day to the cost of a trip adds the following to the daily costs of mackerel and longfin squid trips based on 2010 observer data (which collects cost information):

-9% for single MWT mackerel trips (from $3,494 per day to $4,294)
-12% for paired MWT mackerel trips (from $2,602 per day to $3,402)
-20% for higher volume SMBT mackerel trips (from $1,639 per day to $2,439)
-35% for higher volume SMBT longfin squid trips (from $939 per day to $1,739)
-77% for lower volume SMBT longfin squid trips (from $424 per day to $1,224)

The average trip cost values cited in this analysis include variable costs such as fuel, oil, ice, food, fishing supplies, vessel/gear damages, and water but does not include crew shares/wages, dockage fees, or boat mortgage payments. Trip costs were estimated based on 2010 observer data. Observers ask for information on these costs and vessels were binned by gear, vessel size, and day/multi-day vessels.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better data, and to the extent that better data leads to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since the alternatives in this alternative set are related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternative sets that deal with management measures that may utilize better data.

5f. Vessels would have to pay $325 (modifiable via specifications) for observers when they carry observers to meet the observer coverage goals adopted by the Council in 5b4 and 5c4. NEFSC would accredit observers and vessels would have to contract and pay observers. (PREFERRED)

Since NMFS has indicated that industry funding of additional observer coverage would be a prerequisite to increasing observer coverage, the impacts of industry paying for observer coverage have been described in each of the action alternatives 5b-5e above. The DEIS described costs assuming vessels contributed $800/day but the analysis has been updated to reflect that the Council specified that at least to start, vessels would have to pay $325/day.

5g. Phase-in industry funding over 4 years such that to achieve the target coverage selected in 5b-5e above, NMFS would pay for 100%, 75%, 50%, then 25% of the at-sea portion of the specified observer coverage

NMFS has indicated this is not feasible from a funding point of view. The impacts of this alternative would be the same as the accompanying observer coverage level described in 5b-5e except that costs to the fishery would be less.

If vessels have to pay for observer coverage then a negative impact would be expected compared to the no-action alternative. Alternatives 5b-5d above compare the cost of observer coverage to the revenues from different types of vessels that participate in the mackerel and longfin squid fisheries. Economic costs are discussed within those alternatives assuming that industry funding would be paying for most of the increased observer coverage. In the short term cost-sharing with NMFS would make the economic impacts less negative but would not have an impact on the long term. For this alternative, if NMFS paid 100% of the observer coverage there would be negligible socio-economic impacts in the first year. For the phase in years, the impacts per trip would be the same as described above, but the number of trips for which industry would have to pay for observers would be less initially and increase in years 2, 3,and 4 at which point NMFS would cover 25% of the costs and the fishery would have to cover 75% of the costs.

5h. Require reevaluation of coverage requirement after 2 years to determine if catch rates justify continued expense of continued high coverage rates. (PREFERRED)

The Council would conduct an examination of the results of any higher coverage rates implemented through this action and consider if adjustments to the coverage rates are warranted. Depending on the results and desired actions, subsequent action could be accomplished via specifications, a framework adjustment, or an Amendment as appropriate and would include a separate environmental analysis. No immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

Alternative Set 5 Summary - At-Sea Observer Coverage Requirements

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

All of the action alternatives that increase observer coverage (5b-5e) are expected to have positive impacts for butterfish due to discarding concerns that would be alleviated by higher coverage rates, especially in the longfin squid fishery. Low positive impacts would be expected for the other managed resources since discarding is not considered to be a major problem for those resources. 5f-5h are more administrative in function.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

All of the action alternatives that increase observer coverage (5b-5e) are expected to have positive impacts for non-target species due to catch and discarding concerns that would be alleviated by higher coverage rates. Higher coverage rates will yield more certainty about the nature of catch in the mackerel and longfin squid fisheries and so greater benefits. Positive impacts would appear higher related to mackerel observers since that fishery appears to interact with RH/S more than the longfin squid fishery. 5f-5h are more administrative in function.

3. Habitat Impacts Including EFH

None of the action alternatives are expected to directly impact habitat but if vessels had to pay for their observer coverage (which would be necessary for implementation), that could reduce effort which would generally lower habitat impacts.

4. Protected Resources

None of the action alternatives are expected to directly impact protected resources but if vessels had to pay for their observer coverage (which would be necessary for implementation), that could reduce effort which would generally lower protected resource interactions. Higher coverage would generate better data on protected resource interactions.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial participants would incur relatively high costs related to paying for observer coverage (and higher coverage results in higher costs). The interested public would benefit primarily to the extent that better monitoring could lead to better RH/S management.

7.6 Alternative Set 6 - Mortality Caps

Statement of Problem/Need for Action:

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements.

Background:

The alternatives would seek to directly limit the mortality of the relevant RH/S species in the mackerel and longfin squid fisheries. While the actual mortality cap quantities would be determined during the specifications process just as annual ACLs/AMs are set, this document explores a range of options so that likely impacts may be evaluated. The range of mortality cap quantities would be evaluated in an environmental assessment during the specifications process. The following values are primarily provided to give the reader a sense of impacts from a range of mortality caps that will be investigated in greater depth during the specifications process.

A cap on a certain fleet/fishery can keep mortality for the fleet/fishery at a certain level. Given the lack of reference points it would be difficult to establish an appropriate cap amount that is meaningfully tied to some impact on RH/S. One would either have to independently figure out how much overall RH catch one wanted and then allocate a portion of that to a cap or one could just look at what various strata have caught historically, and use that information to come up with an amount for a fishery-specific cap. For the mortality cap alternatives, the MSB Monitoring Committee would draft a range of caps for consideration through specifications via an accompanying Environmental Assessment. Precision would likely be quite low under the current observer/monitoring regime levels of coverage.

A cap on RH/S catch in the mackerel and/or longfin squid fishery would operate much like the butterfish cap currently operates in the longfin squid fishery. A catch ratio would be determined using the best available scientific data. As with the butterfish cap, the exact monitoring and extrapolation methodology would be developed during implementation and presented to the Council for comments before the cap became operational. However, the catch ratio would be based on the ratio of RH/S to total retained catch, as appropriate depending on which, if any, action alternatives were chosen. This ratio comes from observer data in the butterfish cap and in the context of this amendment could come from observer data or potentially also port-side sampling data if implemented in this amendment. Then for a given fishery (mackerel or squid) as defined by trips over the incidental landings limit, the ratio is applied to all landings (from dealer data) by that fishery to extrapolate a total RH/S catch estimate. Technical details may be found in Wigley et al. (2007), with the modification of using "kept+discards" in the numerator rather than just discards. Once the estimate reaches a closure threshold identified by the Council in the specifications process, then landings above an incidental nature (also specified during specifications) would be prohibited. The mortality cap would operate in parallel to monitoring for the directed fishery such that reaching either the closure threshold for the directed fishery or the mortality cap threshold would close the directed fishery.

It would probably make more sense to have a fleet-area cap (e.g., midwater trawls in Mid-Atlantic) rather than using the regulatory definition of a "Mackerel" or "Herring" trip to define vessels that are subject to the cap. In other words, the greatest amount of impact on RH/S catch reduction would come from the implementation of a joint cap on both the herring & mackerel fleets. If one instituted just a cap on the mackerel fleets, one of two things could happen if the mackerel fishery was closed due to reaching the cap:

One possibility: the mackerel fishery closes and the exact same fleet continues fishing in the exact same place (Mid-Atlantic Q1) and just retains the Atlantic herring catches and discards mackerel (mackerel discards are addressed with a set-aside in the specifications process). Since retained catch per unit effort of the combined species would go down, overall effort could go up, possibly increasing RH/S catch.

Other possibility: Q1 catches of mackerel and Atlantic herring in the Mid-Atlantic are so mixed that closing mackerel would effectively close herring.

Amendment 5 to the Atlantic Herring FMP proposes allowing caps to be implemented via a framework or specifications and it is possible that in the future a gear/based cap could be coordinated through the NEFMC and MAFMC.

For all of the mortality caps, once the cap or some fraction of the cap is reached (set in specifications) then the fishery would be closed or an incidental trip limit would go into effect (also set in specifications).

NOTE ON COMBINATIONS: All of the action alternatives in this Alternative Set could be implemented singly or in combination with any other alternative(s) in this Alternative Set.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

6a. No-action

If this alternative is selected, then no measures from Alternative Set 6 would be implemented and the existing state management measures (as described in section 5.9) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 6 could result in early closures of the fisheries for mackerel and

longfin squid, such closures would lead to less mortality of those species. However, catching the full quota of the managed species is not expected to cause sustainability problems for the managed species so impacts are low. If the longfin squid fishery is closed early, there would likely be benefits to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 6 could result in early closures of the fisheries for mackerel and longfin squid, such closures would lead to less mortality of non-target species including RH/S. However, the current impacts on RH/S of the mackerel and longfin squid fisheries are not known so impacts are not quantifiable.

3. Habitat Impacts Including EFH

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 6 could result in early closures of the fisheries for mackerel and longfin squid, such closures could lead to less negative habitat impacts, especially related to the longfin squid fishery which primarily uses bottom otter trawl gear. Participants could redirect toward other species in the same or other areas since most participants have multiple permits, but it is not possible to predict such shifts and/or any associated habitat impacts.

4. Protected Resources

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 6 could result in early closures of the fisheries for mackerel and longfin squid, such closures could lead to less protected resource interactions (see Section 6 for details on such interactions). Participants could redirect toward other species in the same or other areas since most participants have multiple permits, but it is not possible to predict such shifts and/or any associated protected resource impacts.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand, fishery participants would not experience revenue loss as a result of fishery closures based on the RH/S cap, which is a positive impact.

On the other hand, to the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S, then choosing the no-action alternative in

comparison to the other alternatives might result in foregone benefits related to lost commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

6b. Implement a mortality cap for river herrings for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

One way to assign mortality caps for river herring would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 35% of total river herring mortality 2005-2010. The table below describes total ocean and quarter 1 mid-water trawl mortalities in the leftmost columns.

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual river herring mortality ratios from 0.02% in 2007 to .86% in 2009 with a mean of 0.45 (% of total catch). The 50%/100,000 filter was used because it has been the way directed mackerel trips have been identified in recent specifications analyses and because this definition encompasses almost all landings. The exact definition of a mackerel trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

In the right hand columns are the landings at which point the mackerel fishery would close depending on the above range of ratios and if the cap was the quarter 1 value. For example, if a cap of 86 mt was used, the mackerel fishery would close when it landed 9,975 mt with a high ratio, 19,063 mt with the mean ratio, or 428,908 mt of fish with a low ratio. Without an

assessment providing advice on overall acceptable fishing mortality, the Council would have to make a policy decision about how much catch to allow in this fishery and would evaluate a range of caps, probably based on recent catch estimates as done in the table below.

Table 68. Example River Herring Caps for Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (35% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.86%	Mackerel would close at these landings (mt) with mean ratio, 0.45%	Mackerel would close at these landings (mt) with low ratio, 0.02%
2006	245	86	9,975	19,063	428,908
2007	664	232	27,029	51,656	1,162,263
2008	672	235	27,333	52,237	1,175,335
2009	361	126	14,679	28,053	631,190
2010	244	85	9,911	18,940	426,160

Source: Unpublished observer data and Appendix 2.

A high ratio means that more river herring were caught and a low ratio means that less river herring were caught. The examples in the above table come from observed data 2006-2010. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the mackerel availability was. Since the realized ratio can vary substantially from year to year, it is difficult to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season. Additional impact analysis would be carried out by the specifications that implemented these caps.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. If the directed fishery is closed because of an mortality cap the managed species may also benefit because of reduced fishing mortality. However, given the uncertainty about MSB stock dynamics and the uncertainty about when a closure might occur it is not possible to quantify such impacts. In general, if the cap is set higher, or the ratio (catch rate of RH/S) is lower, the directed fishery will stay open longer, which will result in less positive impacts for the managed species. Conversely, if the cap is set lower, or the ratio is higher, the directed fishery will close sooner, which will result in more positive impacts for the managed species. If the cap does not result in a closure then there will be no impacts on managed resources compared to the no-action alternative. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts to the managed resource should be low compared to the no action alternative.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 86 mt, and a high ratio (catch rate of RH/S) is observed, for example 0.86%, then the fishery would be closed at 9,975 mt total landings (of which a portion is mackerel). In some years this value may be negligibly constraining but in years where mackerel were available (e.g. 2004/2006) it could be quite constraining. If mackerel closed earlier than it otherwise would there would likely be less catch of river herrings (and other non-target species) but it is not possible to quantify the effect (if any) on river herring stocks of catching only 86 mt of river herring versus some other amount due to the paucity of assessment information. Given the uncertainty of cap amounts and/or encounter rates it is not possible to quantify the impacts but the lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more potentially positive impacts will occur to non-target species, including RH/S, because non-target species mortality in the directed fishery may be reduced. If there was no closure then the impacts on non-target species including RH/S would be the same as described in the no-action alternative. It should be noted that the connection between catch in the mackerel fishery (or other ocean fisheries) and RH/S populations is unknown.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Since the majority of mackerel landings are made with mid-water gear, which generally does not contact the bottom, reductions in mackerel effort due to a cap closure would not be expected to have any impacts on habitat. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts. Depending on the final regulations, closure of the mackerel fishery due to the mortality cap would likely result in a reduction of the mackerel possession limit to the incidental level (20,000 lb), rather than a full prohibition on mackerel possession. Accordingly, any habitat benefits related to reduced effort during a closure may be offset by some smaller-scale bottom trawlers who decide to pursue mackerel under the incidental trip limits (to take advantage of the cut-off supply and possibly higher prices). Thus, overall effort that contacts the bottom may be level, suggesting a neutral and/or negligible impact to habitat compared to the no action alternative.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. If the directed fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the reduction in effort. In general, the higher the cap is set, or the lower the ratio (catch rate of RH/S) is, the longer the directed fishery will stay open and less positive impacts occur for protected resources because of continued potential interactions. The lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more positive impacts for protected species will occur. If there was no closure then the impacts on protected resources would be the same as described in the no-action alternative.

5. Human Communities

A potentially high negative impact would be expected for mackerel fishery participants compared to the no-action alternative if a low cap is chosen, for example 85 mt, and a high ratio (catch rate of RH/S) is observed, for example 0.86%. In such a case then the fishery would be closed at 9,911 mt total catch. In recent years this value may be negligibly constraining but in years where mackerel were available (e.g. 2004/2006) it could be quite constraining. If mackerel closed earlier than it otherwise would there would be associated forgone revenues, with the amount depending on the cap amount, the ratio of river herring observed caught (catch rate of RH), and the availability of mackerel. If the cap is set high enough or the ratio is low enough there would be no losses because the cap would not result in a closure of the directed fishery, and would thus not constrain fishing activity. However, relative to the 2012 proposed landings quota of 33,821 mt, if the mackerel fishery faced the relatively low cap and relatively high catch ratio described above, and was limited to 9,911 mt of catch, 23,910 mt of catch could potentially be forgone. At 2010 ex-vessel prices, 23,910 mt of mackerel would be worth $7.7 million. While the mackerel fishery has not been catching these levels in recent years (see section 6.7.1), these would be an example of potentially forgone revenues in a relatively low cap and relatively high catch ratio situation. If a cap was set lower than 85 mt, or the actual observed ratio was higher, forgone revenue could be higher as well. While a multiplier has not been calculated for mackerel to determine impacts to shore-side businesses, Amendment 10 to the MSB FMP estimated that for longfin squid, dealers lost an amount equal to 73% of the revenue lost by vessels and all shoreside business combined lost an amount equal to 3 times the amount lost by vessels.

Under recent sampling intensities, C.V.s for annual river herring estimates have been improving but at the fine scale necessary to close the directed mackerel fishery C.V.s related to a mortality cap are likely to be over 1.0 (see table A2 in Appendix 2). Given C.V.s over 0.5 translate into the value of zero being within the 95% confidence interval, it may be difficult to justify closing a fishery given the science tells us our estimates are likely very inaccurate in any given year. The estimates' uncertainty also makes it difficult for business planning purposes if highly uncertain estimates may be causing fishery closures.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to

rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

6c. Implement a mortality cap for shads for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S). (PREFERRED)

One way to assign mortality caps for shad would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for 12% of total shad mortality 2005-2010. The table below describes total ocean and quarter 1 mid-water trawl mortalities in the leftmost columns (2006 omitted because of lack of shad records).

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 50% or at least 100,000 pounds of mackerel (encompasses almost all landings) results in annual shad mortality ratios from 0.004% in 2009 to 0.05% in 2007 with a mean of 0.03. The 50%/100,000 filter was used because it has been the way directed mackerel trips have been identified in recent specifications analyses and because this definition encompasses almost all landings. The exact definition of a mackerel trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

In the right hand columns are the landings at which point the mackerel fishery would close depending on the above range of ratios and if the cap was the quarter 1 value. For example, if a cap of 7mt was used, the mackerel fishery would close when it landed 14,364 mt with a high ratio, 23,940mt with the mean ratio, or 179,550 mt of fish with a low ratio. The differences in the two 7mt caps are due to rounding. Without an assessment providing advice on overall acceptable fishing mortality, the Council would have to make a policy decision about how much catch to allow in this fishery and would evaluate a range of caps, probably based on recent catch estimates as done in the table below.

Table 69. Example Shad Caps for Mackerel

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Water Trawl Quarter 1 mortality (mt) (12% of total) = Mortality Cap Possibility	Mackerel would close at these landings (mt) with high ratio, 0.05%	Mackerel would close at these landings (mt) with mean ratio, 0.03%	Mackerel would close at these landings (mt) with low ratio, 0.004%
2007	60	7	14,364	23,940	179,550
2008	60	7	14,450	24,084	180,630
2009	70	8	16,903	28,172	211,290
2010	47	6	11,338	18,896	141,720

Source: Unpublished observer data and Appendix 2.

A high ratio means that more shad were caught and a low ratio means that less shad were caught. The examples in the above table come from observed data 2006-2010. The main point is that whether mackerel would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the mackerel availability was. Since the realized ratio can vary substantially from year to year, it is difficult to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season. Additional impact analysis would be carried out by the specifications that implemented these caps.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. If the directed fishery is closed because of a mortality cap the managed species may also benefit because of reduced fishing mortality. However, given the uncertainty about MSB stock dynamics and the uncertainty about when a closure might occur it is not possible to quantify such impacts. In general, if the cap is set higher, or the ratio (catch rate of RH/S) is lower, the directed fishery will stay open longer, which will result in less positive impacts for the managed species. Conversely, if the cap is set lower, or the ratio is higher, the directed fishery will close sooner, which will result in more positive impacts for the managed species. If the cap does not result in a closure then there will be no impacts on managed resources compared to the no-action alternative. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts to the managed resource should be low compared to the no action alternative.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 6mt, and a high ratio (catch rate of RH/S) is observed, for example 0.05%, then the fishery would be closed at 11,338 mt total landings (of which a portion is mackerel). In some years this value may be negligibly constraining but in years where mackerel

were available (e.g. 2004/2006) it could be quite constraining. If mackerel closed earlier than it otherwise would there would likely be less catch of shads (and other non-target species) but it is not possible to quantify the effect (if any) on shad stocks of catching only 6mt of shad versus some other amount due to the paucity of assessment information. Given the uncertainty of cap amounts and/or encounter rates it is not possible to quantify the impacts but the lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more potentially positive impacts will occur to non-target species, including RH/S, because non-target species mortality in the directed fishery may be reduced. If there was no closure then the impacts on non-target species including RH/S would be the same as described in the no-action alternative. It should be noted that the connection between catch in the mackerel fishery (or other ocean fisheries) and RH/S populations is unknown.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Since the majority of mackerel landings are made with mid-water gear, which generally does not contact the bottom, reductions in mackerel effort due to a cap closure would not be expected to have any impacts on habitat. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts. Depending on the final regulations, closure of the mackerel fishery due to the mortality cap would likely result in a reduction of the mackerel possession limit to the incidental level (20,000 lb), rather than a full prohibition on mackerel possession. Accordingly, any habitat benefits related to reduced effort during a closure may be offset by some smaller-scale bottom trawlers who decide to pursue mackerel under the incidental trip limits (to take advantage of the cut-off supply and possibly higher prices). Thus, overall effort that contacts the bottom may be level, suggesting a neutral and/or negligible impact to habitat compared to the no action alternative.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. If the directed fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the reduction in effort. In general, the higher the cap is set, or the lower the ratio (catch rate of RH/S) is, the longer the directed fishery will stay open and less positive impacts occur for protected resources because of continued potential interactions. The lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more positive impacts for protected species will occur. If there was no closure then the impacts on protected resources would be the same as described in the no-action alternative.

5. Human Communities

A potentially high negative impact for mackerel fishery participants would be expected compared to the no-action alternative. If a low cap is chosen, for example 6mt, and a high ratio (catch rate of RH/S) is observed, for example 0.05%, then the fishery would be closed at 11,338 mt total catch. In recent years this value may be negligibly constraining but in years where mackerel were available (e.g. 2004/2006) it could be quite constraining. If mackerel closed earlier than it otherwise would there would be associated forgone revenues, with the amount depending on the cap amount, the ratio of shad observed caught (catch rate of shad), and the

availability of mackerel. If the cap is set high enough or the ratio is low enough there would be no losses because the cap would not result in a closure of the directed fishery, and would thus not constrain fishing activity. However, relative to the 2012 proposed landings quota of 33,821 mt, if the mackerel fishery faced the relatively low cap and relatively high catch ratio described above, and was limited to 11,338 mt of catch, 22,483 mt of catch could potentially be forgone. At 2010 ex-vessel prices, 22,483 mt of mackerel would be worth $7.3 million. While the mackerel fishery has not been catching these levels in recent years (see section 6.7.1), these would be an example of potentially forgone revenues in a relatively low cap and relatively high catch ratio situation. If a cap was set lower than 6 mt or the actual observed ratio was higher, forgone revenue could be higher as well. While a multiplier has not been calculated for mackerel to determine impacts to shore-side businesses, Amendment 10 to the MSB FMP estimated that for longfin squid, dealers lost an amount equal to 73% of the revenue lost by vessels and all shoreside business combined lost an amount equal to 3 times the amount lost by vessels.

Under recent sampling intensities, C.V.s for annual shad estimates have been improving but at the fine scale necessary to close "the mackerel fishery" C.V.s related to a mortality cap are likely to be over 1.0 (see table A2 in Appendix 2). Given C.V.s over 0.5 translate into the value of zero being within the 95% confidence interval, it may be difficult to justify closing a fishery given the science tells us our estimates are likely very inaccurate in any given year. The low overall catch of shad and therefore low amount of a cap based on recent catch would likely greatly complicate mortality-cap based management for shad given the imprecision of catch data.

The estimates' uncertainty also makes it difficult for business planning purposes if highly uncertain estimates may be causing fishery closures.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

6d. Implement a mortality cap for river herrings for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of river herring mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S).

One way to assign mortality caps for river herring would be to base it on the range of estimated river herring mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 5% of total river herring mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 5% of total mortalities in the leftmost columns.

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid results in annual river herring mortality ratios from almost zero in 2007 to .17% in 2009 with a mean of 0.06%. The 2,500 pound filter was used because it has been the way directed longfin squid trips have been identified in the butterfish cap for the longfin squid fishery and because is encompasses almost all longfin squid landings. The exact definition of a longfin squid trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

In the right hand columns are the landings at which point the longfin squid fishery would close depending on the above range of ratios and if the cap was the Mid-Atlantic small mesh bottom trawl portion of total ocean fishing mortality. For example, if a cap of 12mt was used, the longfin squid fishery would close when it landed 7,233 mt with a high ratio, and 20,424mt with the mean ratio (the low ratio was nearly zero so it would not lead to a constraint). Without an assessment providing advice on overall acceptable fishing mortality, the Council would have to make a policy decision about how much catch to allow in this fishery and would evaluate a range of caps, probably based on recent catch estimates as done in the table below.

Table 70. Example River Herring Caps for longfin squid.

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.17%	Longfin squid would close at these landings (mt) with mean ratio, 0.06%
2006	245	12	7,233	20,424
2007	664	33	19,534	55,346
2008	672	34	19,754	55,968
2009	361	18	10,608	30,057
2010	244	12	7,162	20,293

Source: Unpublished observer data and Appendix 2.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the river herring mortality cap is illustrated on the rightmost columns in the above table (these can be compared to recent landings detailed in Section 6.6). A high ratio means that more river herring were caught and a low ratio means that less river herring were caught. The examples in the above table come from observed data 2006-2010. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of river herring was, and what the longfin squid availability was. Since the realized ratio can vary substantially from year to year, it is difficult to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season. Additional impact analysis would be carried out by the specifications that implemented these caps.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. If the directed fishery is closed because of a mortality cap the managed species may also benefit because of reduced fishing mortality. However, given the uncertainty about MSB stock dynamics and the uncertainty about when a closure might occur it is not possible to quantify such impacts. In general, if the cap is set higher, or the ratio (catch rate of RH/S) is lower, the directed fishery will stay open longer, which will result in less positive impacts for the managed species. Conversely, if the cap is set lower, or the ratio is higher, the directed fishery will close sooner, which will result in more positive impacts for the managed species. If the cap does not result in a closure then there will be no impacts on managed resources compared to the no-action alternative. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts to the managed resource should be low

compared to the no action alternative. If the longfin squid fishery is closed early, there would likely be positive impacts to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 12mt, and a high ratio (catch rate of RH/S) is observed, for example 0.17%, then the fishery would be closed at 7,233 mt total landings (of which a portion is longfin squid), which would be constraining in most years. If longfin squid closed earlier than it otherwise would there would likely be less catch of river herrings (and other non-target species) but it is not possible to quantify the effect (if any) on river herring stocks of catching only 12mt of river herring versus some other amount due to the paucity of assessment information. Given the uncertainty of cap amounts and/or encounter rates it is not possible to quantify the impacts but the lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more potentially positive impacts will occur to non-target species, including RH/S, because non-target species mortality in the directed fishery may be reduced. If there was no closure then the impacts on non-target species including RH/S would be the same as described in the no-action alternative. It should be noted that the connection between catch in the longfin squid fishery (or other ocean fisheries) and RH/S populations is unknown.

However, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A potentially positive impact would be expected compared to the no-action alternative. Since the longfin squid fishery primarily uses bottom otter trawl, if a mortality cap closed the longfin squid fishery early there should be less adverse habitat impacts, especially in the winter/spring offshore fishery that occurs in deeper water (the summer fishery mostly takes place in sandy areas that are subject to a high level of natural disturbance). If there was no closure then there would be no impacts compared to the no-action alternative.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. If the directed fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the reduction in effort. In general, the higher the cap is set, or the lower the ratio (catch rate of RH/S) is, the longer the directed fishery will stay open and less positive impacts occur for protected resources because of continued potential interactions. The lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more positive impacts for protected species will occur. If there was no closure then the impacts on protected resources would be the same as described in the no-action alternative.

5. Human Communities

A potentially high negative impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 12 mt, and a high ratio (catch rate of RH/S) is observed, for example 0.17%, then the fishery would be closed at 7,233 mt total catch. In years where longfin squid were available (e.g. 2004/2005) this could be quite constraining. If longfin squid closed earlier than it otherwise would there would be associated forgone revenues, with the amount depending on the cap amount, the ratio of river herring observed caught (catch rate of RH), and the availability of longfin squid. If the cap is set high enough or the ratio is low enough there would be no losses because the cap would not result in a closure of the directed fishery, and would thus not constrain fishing activity. However, relative to the 2012 proposed landings quota of 22,445 mt, if the longfin squid fishery faced the relatively low cap and relatively high catch ratio described above, and was limited to 7,233 mt of catch, 15,212 mt of catch could potentially be forgone. At 2010 ex-vessel prices, 15,212 mt of longfin squid would be worth $34.8 million. While the longfin squid fishery has not been catching these levels in recent years (see section 6.7.4), these would be an example of potentially forgone revenues in a relatively low cap and relatively high catch ratio situation. If a cap was set lower than 12 mt or the actual observed ratio was higher, forgone revenue could be higher as well. Amendment 10 to the MSB FMP estimated that for longfin squid, dealers lost an amount equal to 73% of the revenue lost by vessels and all shoreside business combined lost an amount equal to 3 times the amount lost by vessels.

Under recent sampling intensities, C.V.s for annual river herring estimates have been improving but at the fine scale necessary to close “the longfin squid fishery” C.V.s related to a mortality cap are likely to be over 1.0 (see table A2 in Appendix 2). Given C.V.s over 0.5 translate into the value of zero being within the 95% confidence interval, it may be difficult to justify closing a fishery given the science tells us our estimates are likely very inaccurate in any given year.

The estimates’ uncertainty also makes it difficult for business planning purposes if highly uncertain estimates may be causing fishery closures.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in

comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

6e. Implement a mortality cap for shads for the longfin squid fishery whereby the longfin squid fishery would close once it is determined that it created a certain level of shad mortality (that level would be determined annually by Council in specification process unless RH/S were added as stocks in the fishery in which case SSC would be involved in ABC setting for RH/S).

One way to assign mortality caps for shad would be to base it on the range of estimated shad mortality conducted by the science center/FMAT to support Am14. Mid-Atlantic small mesh bottom trawl accounted for 11.5% of total shad mortality. While Mid-Atlantic small mesh bottom trawl encompasses a variety of fisheries besides longfin squid (including Atlantic herring), some of the New England small mesh bottom trawl mortality is probably related to longfin squid fishing so using the full Mid-Atlantic value is probably reasonable. The table below describes total ocean and 11.5% of total mortalities in the leftmost columns.

Using the separate ratio method described in Wigley et al., 2007 (modified by adding kept in the numerator in addition to discards) developed for the butterfish cap and applying it to observer trips and regular trips that landed at least 2,500 pounds longfin squid results in annual shad mortality ratios from almost 0.03% in 2009 to 0.21% in 2010 with a mean of 0.10%. The 2,500 pound filter was used because it has been the way directed longfin squid trips have been identified in the butterfish cap for the longfin squid fishery and because is encompasses almost all longfin squid landings. The exact definition of a longfin squid trip would be developed in the implementation process, as has been the case with the butterfish cap for the longfin squid fishery.

In the right hand columns are the landings at which point the longfin squid fishery would close depending on the above range of ratios and if the cap the Mid-Atlantic small mesh bottom trawl portion of total ocean fishing mortality. For example, if a cap of 5mt was used, the longfin squid fishery would close when it landed 2,587 mt with a high ratio, 5,433mt with the mean ratio, or 18,109 mt of fish with a low ratio. The differences in the two 7mt caps are due to rounding.

Without an assessment providing advice on overall acceptable fishing mortality, the Council would have to make a policy decision about how much catch to allow in this fishery and would evaluate a range of caps, probably based on recent catch estimates as done in the table below.

Table 71. Example Shad Caps for Longfin squid.

	Total Estimated Ocean Fishing Mortality (mt)	Mid-Atlantic Small Mesh Bottom Trawl mortality (mt) (11.5% of total) = Mortality Cap Possibility	Longfin squid would close at these landings (mt) with high ratio, 0.21%	Longfin squid would close at these landings (mt) with mean ratio, 0.10%	Longfin squid would close at these landings (mt) with low ratio, 0.03%
2006	47	5	2,587	5,433	18,109
2007	60	7	3,278	6,883	22,943
2008	60	7	3,297	6,924	23,081
2009	70	8	3,857	8,099	26,998
2010	47	5	2,587	5,433	18,109

Source: Unpublished observer data and Appendix 2.

If these values were used with the above range of mortality caps, the amount of total fish (the ratio is based on all fish retained) that could be harvested by trips as defined above before the longfin squid fishery was shut down by the shad mortality cap is illustrated on the rightmost columns in the above table (these can be compared to recent landings detailed in Section 6.6). A high ratio means that more shad were caught and a low ratio means that less shad were caught. The examples in the above table come for observed data 2006-2010. The main point is that whether longfin squid would close because of a cap would depend on how much the Council set the cap at in a given year, what the realized catch of shad was, and what the longfin squid availability was. Since the realized ratio can vary substantially from year to year, it is difficult to predict impacts other than to acknowledge that in some years a closure could come very early and in some years a closure could not happen at all. If the ratio is very low, the fishery would be allowed to continue operating, as a closure would occur at a landings level much higher than recent quotas. If the ratio is very high, a closure could occur early in the season. Additional impact analysis would be carried out by the specifications that implemented these caps.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected compared to the no-action alternative. If the directed fishery is closed because of a mortality cap the managed species may also benefit because of reduced fishing mortality. However, given the uncertainty about MSB stock dynamics and the uncertainty about when a closure might occur it is not possible to quantify such impacts. In general, if the cap is set higher, or the ratio (catch rate of RH/S) is lower, the directed fishery will stay open longer, which will result in less positive impacts for the managed species. Conversely, if the cap is set lower, or the ratio is higher, the directed fishery will close sooner, which will result in more positive impacts for the managed species. If the cap does not result in a closure then there will be no impacts on managed resources compared to the no-action

alternative. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts to the managed resource should be low compared to the no action alternative. If the longfin squid fishery is closed early, there would likely be positive impacts to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 5mt, and a high ratio (catch rate of RH/S) is observed, for example 0.21%, then the fishery would be closed at 2,587 mt total landings (of which a portion is longfin squid), which would be very constraining in every year. If longfin squid closed earlier than it otherwise would there would likely be less catch of shads (and other non-target species) but it is not possible to quantify the effect (if any) on shad stocks of catching only 5mt of shad versus some other amount due to the paucity of assessment information. Given the uncertainty of cap amounts and/or encounter rates it is not possible to quantify the impacts but the lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more potentially positive impacts will occur to non-target species, including RH/S, because non-target species mortality in the directed fishery may be reduced. If there was no closure then the impacts on non-target species including RH/S would be the same as described in the no-action alternative. It should be noted that the connection between catch in the longfin squid fishery (or other ocean fisheries) and RH/S populations is unknown.

However, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A potentially positive impact would be expected compared to the no-action alternative. Since the longfin squid fishery primarily uses bottom otter trawl, if a mortality cap closed the longfin squid fishery early there should be less adverse habitat impacts, especially in the winter/spring offshore fishery that occurs in deeper water (the summer fishery mostly takes place in sandy areas that are subject to a high level of natural disturbance). If there was no closure then there would be no impacts compared to the no-action alternative.

4. Protected Resources

A potentially positive impact would be expected compared to the no-action alternative. If the directed fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the reduction in effort. In general, the higher the cap is set, or the lower the ratio (catch rate of RH/S) is, the longer the directed fishery will stay open and less positive impacts occur for protected resources because of continued potential interactions. The lower the cap is set, or the higher the ratio is, the shorter the directed fishery will stay open and more positive impacts for protected species will occur. If there was no closure then the impacts on protected resources would be the same as described in the no-action alternative.

5. Human Communities

A potentially high negative impact would be expected compared to the no-action alternative. If a low cap is chosen, for example 5mt, and a high ratio (catch rate of RH/S) is observed, for example 0.21%, then the fishery would be closed at 2,587 mt total catch, which would be very constraining in every year. If longfin squid closed earlier than it otherwise would there would be associated forgone revenues, with the amount depending on the cap amount, the ratio of shad observed caught (catch rate of shad), and the availability of longfin squid. If the cap is set high enough or the ratio is low enough there would be no losses because the cap would not result in a closure of the directed fishery, and would thus not constrain fishing activity. However, relative to the 2012 proposed landings quota of 22,445 mt, if the longfin squid fishery faced the relatively low cap and relatively high catch ratio described above, and was limited to 2,587mt of catch, 19,858mt of catch could potentially be forgone. At 2010 ex-vessel prices, 19,858mt of longfin squid would be worth $45.4 million. While the longfin squid fishery has not been catching these levels in recent years (see section 6.7.4), these would be an example of potentially forgone revenues in a relatively low cap and relatively high catch ratio situation. If a cap was set lower than 5 mt or the actual observed ratio was higher, forgone revenue could be higher as well. Amendment 10 to the MSB FMP estimated that for longfin squid, dealers lost an amount equal to 73% of the revenue lost by vessels and all shoreside business combined lost an amount equal to 3 times the amount lost by vessels.

Under recent sampling intensities, C.V.s for annual shad estimates have been improving but at the fine scale necessary to close "the longfin squid fishery" C.V.s related to a mortality cap are likely to be over 1.0 (see table A2 in Appendix 2). Given C.V.s over 0.5 translate into the value of zero being within the 95% confidence interval, it may be difficult to justify closing a fishery given the science tells us our estimates are likely very inaccurate in any given year. The low overall catch of shad and therefore low amount of a cap based on recent catch would likely greatly complicate mortality-cap based management for shad given the imprecision of catch data.

The estimates' uncertainty also makes it difficult for business planning purposes if highly uncertain estimates may be causing fishery closures.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing

optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

6f. Add mortality caps to list of measures that can be frameworked. (PREFERRED)

Allowing a cap to be considered via a framework should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration. No immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

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Alternative Set 6 Summary - Mortality Caps

In this amendment, the Council chose to add a cap for RH/S on the mackerel fishery in the 2014 MSB specifications. Additional analysis will be available for the impacts of the cap in the analysis that supports the particular cap level that is implemented via the specifications.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

All of the RH/S mortality cap action alternatives (except 6f which is administrative) could potentially lead to directed fishery closures that could benefit the managed species but impacts should be low since even achieving their full quota should be sustainable. Closures of the longfin squid fishery would be particularly beneficial to butterfish given the relatively high catch of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

Depending on how high the RH/S mortality caps were set, there could be less non-target interactions if closures occur under any of the action alternatives.

3. Habitat Impacts Including EFH

Depending on how high the RH/S mortality caps were set, there could be less effort and so less habitat disturbances if closures occur under any of the action alternatives, especially longfin squid closures since that fishery predominantly uses bottom trawl gear.

4. Protected Resources

Depending on how high the RH/S mortality caps were set, there could be less effort and so less protected resource interactions if closures occur under any of the action alternatives.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial participants could incur low to high costs in the form of reduced revenues depending on how high any RH/S caps were set and depending on fishery performance. The interested public would benefit to the extent that lower catch helped rebuild RH/S stocks (which is highly uncertain).

7.7 Alternative Set 7 – Restrictions in areas of high RH/S catch

Statement of Problem/Need for Action:

There are currently no limits on catch of RH/S in the mackerel and/or longfin squid fisheries other than state landing requirements

Background:

The Council originally hoped to include some alternatives that would restrict fishing in relatively small areas that appeared to be "hotspots" for RH/S catch. The Amendment's Fishery Management Action Team's found that small-area management is unlikely to be successful (see Appendices) because of the wide and variable distribution of RH/S and of the mackerel and longfin squid fisheries. Thus small area management may just reshuffle effort with unpredictable impacts. The table below is designed to help illustrate how even if you reduce catch rates of one species, for example blueback herring, but reduce catch rates of the directed species even more, it can be possible to do more harm than good if the fleet increases effort to maintain the same amount of harvest. For example, if catch rates of blueback herring are lowered a little and mackerel catch rates and effort are neutral, then this is "good" in that less blueback herring would probably be caught. On the other hand if blueback herring catch rates are lowered a little but mackerel catch rates a lowered a lot and effort increases a lot to make up the difference, then this could be "bad" in that even though catch ***rates*** of blueback herring may have gone down, total catch may have gone up. Thus the catch rates of both the target and non-target species are important when considering area-based management. The main point is just that with the wide and varied distribution of RH/S, and the wide and varied distribution of the target species, it appears very difficult to predict whether impacts from small area-based measures may be neutral, positive, or negative for RH/S.

Table 72. Direct/Non-Target Impact Schematic

Effects on non-target catch of moving effort assuming effort changes to maintain constant mackerel catch if CPUE changes
"good" = lower overall non-taget catches; "bad" = higher overall non-target catches

		Mackerel		
	CPUE Changes	neutral	a little lower	a lot lower
Blueback	neutral	0	bad	bad
	a little lower	good	0	bad
	a lot lower	good	good	0

Because the Council instructed the FMAT to generate area-based alternatives that would be likely to provide protection to RH/S, the FMAT generated several alternatives that are area based but the FMAT also acknowledged that such large-scale closures would effectively close the fisheries for many participants. Council staff attempted to perform additional smaller-scale examinations of the data (for example around Hudson canyon) but at such small scales there are too few observations to draw strong conclusions.

The FMAT analysis suggests that because of the spatial and temporal variability of observed (Northeast Fishery Observer Program or "NEFOP") RH/S catch, the same kind of variability in mackerel and longfin squid effort and catch, and the same kind of variability in RH/S NEFSC trawl survey catches, that very large areas would be required to ensure that management was not just redistributing effort, possibly in a way that could increase RH/S catch. For this reason Council staff used the FMAT GIS analysis to construct areas for mackerel and longfin squid based on the mid-water and small-mesh bottom trawl fleet effort data and RH/S catch data.

NOTE ON COMBINATIONS: 7bMack and 7cMack are mutually exclusive – the Council could close the area to directed fishing (7bMack) or require observers (7cMack) but not both. Likewise 7bLong and 7cLong are mutually exclusive – the Council could close the area to directed fishing (7bLong) or require observers (7cLong) but not both. One of the mackerel alternatives (either 7bMack or 7cMack) could be combined with one of the longfin squid alternatives (either 7bLong or 7cLong) however. 7d could be added to any 7b or 7c alternative to make those provisions only applicable after a cap-based trigger was reached. The Council would have to specify in this case that the Alternative Set 6 cap trigger was only a trigger for Alternative Set 7 rather than a stand-alone cap measure. 7e could be chosen in addition to any other alternative in this Alternative Set.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (7cMack and 7cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

7a. No-action regarding large closed areas (PREFERRED)

If this alternative is selected, then no measures from Alternative Set 7 would be implemented and the existing state management measures (as described in section 5.7) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 7 would likely reduce effort and catch of the managed species (mackerel and longfin squid), such alternatives would lead to less mortality of those species. However, catching the full quota of the managed species is not expected to cause sustainability problems for the managed species so impacts are low. If the longfin squid fishery is reduced, there would likely be benefits to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 7 would likely reduce effort for the managed species (mackerel and longfin squid), such alternatives would also likely lead to less mortality of non-target species including RH/S. However, the current impacts on RH/S of the mackerel and longfin squid fisheries are not known so impacts are not quantifiable.

3. Habitat Impacts Including EFH

A potentially negative impact would be expected compared to the action alternatives. Since alternatives in Alternative Set 7 would likely reduce effort for the managed species (mackerel and longfin squid), such alternatives could also likely lead to less habitat impacts, especially related to longfin squid fishing since it uses bottom otter trawl gear. Participants could redirect toward other species in the same or other areas since most participants have multiple permits, but it is not possible to predict such shifts and/or any associated habitat impacts.

4. Protected Resources

A potentially negative impact would be expected compared to the action alternatives since alternatives in Alternative Set 7 would likely reduce effort for the managed species (mackerel and longfin squid), such alternatives could also likely lead to less protected resource interactions (see Section 6 for details on such interactions). Participants could redirect toward other species in the same or other areas since most participants have multiple permits, but it is not possible to predict such shifts and/or any associated protected resource impacts.

5. Human Communities

The impacts of the no-action alternative in comparison to the other alternatives for human communities appear mixed with uncertain net impacts. On one hand the costs to fishery participants in terms of lost fishing opportunities due to time/area closures or having to carry and pay for observers to enter the restricted areas would be avoided, which is a positive impact.

On the other hand, to the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S, then choosing the no-action alternative in comparison to the other alternatives might result in foregone benefits related to lost commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

<u>7bMack</u>. Closed Area - Prohibit retention of more than 20,000 pounds of mackerel in RH/S Mackerel Management Area (applies in Quarter 1 only – see map below) for vessels with federal mackerel permits.

Note: While the scope of this time-area closure would curtail mackerel fishing, some effort could occur/shift to areas outside the closure area and some effort could occur/shift to other time periods.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected for mackerel compared to the no-action alternative since effort and catch would likely be reduced. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts should be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A positive impact would be expected for non-target species including RH/S compared to the no-action alternative since effort and catch would likely be reduced. Given the RH/S Mackerel Management Area encompasses most Quarter 1 mid-water trawl effort as well as most Quarter 1 observer data observations of RH/S catch, which are estimated to account for 35% of total RH/S catch, it is likely that effectively closing this area to mackerel fishing would create some positive impacts for RH/S and other non-target species, but it is not possible to quantify the effect (if any) on RH/S stocks of catching one amount of RH/S versus some other amount due to the paucity of assessment information. In addition, effort redistribution (including shifts of effort to other fisheries in the same area) could lead to unexpected potentially negative impacts if they ultimately increase non-target species interactions. Due to the expected overall lower effort these would not be expected to change the overall positive impact.

From an information point of view, if vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Since the proposed RH/S area is very large and encompasses nearly the entire "footprint" of the winter-spring directed mackerel fishery, a trip limit of 20,000 lbs in Quarter 1 would essentially shut down the mackerel fishery because vessels would have to travel outside of the area to target mackerel at levels above 20,000 lb. So there would be a reduction in mackerel fishing, but since mid-water trawl gear, which accounts for most mackerel effort, and this gear type does not generally contact the bottom, there would be no benefits to benthic habitats. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts. Also, depending on the final regulations, closure of the mackerel fishery due to the mortality cap would likely result in a reduction of the mackerel possession limit to the incidental level (20,000 lb), rather than a full prohibition on mackerel possession. Accordingly, any habitat

benefits related to reduced effort during a closure may be offset by some smaller-scale bottom trawlers who decide to pursue mackerel under the incidental trip limits (to take advantage of the cut-off supply and possibly higher prices). Thus, overall effort that contacts the bottom may be level, suggesting a neutral and/or negligible impact to habitat compared to the no action alternative.

4. Protected Resources

A positive impact would be expected for protected resources compared to the no-action alternative since effort would likely be reduced given the scope of the closed area. Reduced effort could potentially result in a reduced number of protected species interactions in the mackerel fishery.

From an information point of view, if vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

The impacts appear mixed with uncertain net impacts compared to the no-action alternative. On one hand, as described in the table below, about 85% of mackerel revenues with an assigned area (2/3 to ¾ of total landings) from 2006-2010 came from within the RH/S Mackerel Management Area. While vessels would compensate as best they could so impacts are difficult to further quantify, vessels that typically rely on mackerel would likely experience negative economic impacts due to lost fishing revenue or costs to transit the area to a non-closed area.

Table 73. Mackerel Revenues In and Out of RH/S Area

	Outside Mackerel Value ($)	Inside Mackerel Value ($)
2006	3,149,111	17,323,851
2007	946,926	2,666,001
2008	553,705	3,200,344
2009	681,665	6,655,122
2010	471,663	2,920,919
Total	5,803,070	32,766,237
%	15%	85%

Source: Unpublished VTR Data

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other

non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

<u>7bLong</u>. Closed Area - Prohibit retention of more than 2,500 pounds longfin squid in RH/S Longfin Squid Management Area (applies year-round – see maps below) for vessels with federal longfin squid moratorium permits.

Note: While the scope of this time-area closure would curtail longfin squid fishing, some effort could occur/shift to areas outside the closure area.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected for longfin squid compared to the no-action alternative since effort and catch would likely be reduced. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts should be low. If the longfin squid fishery is reduced, there would likely be benefits to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A low positive impact would be expected for non-target species including RH/S compared to the no-action alternative since effort and catch would likely be reduced. Given the RH/S Longfin Squid Management Area encompasses most of the area where small mesh bottom trawl effort overlaps with RH/S catches, it is likely that effectively closing this area to longfin squid fishing would create some positive impacts for non-target species including RH/S, but it is not possible to quantify the effect (if any) on RH/S stocks of catching one amount of RH/S versus some other amount due to the paucity of assessment information.

From an information point of view, if vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

However, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3). This suggests impacts to non-target species may be low.

In addition, effort redistribution (including shifts of effort to other fisheries in the same area) could lead to unexpected potentially negative impacts if they ultimately increase non-target species interactions. Due to the expected overall lower effort these would not be expected to change the overall positive impact.

3. Habitat Impacts Including EFH

A low positive impact would be expected compared to the no-action alternative. The proposed closure areas for longfin squid are large enough that some overall effort reduction would occur, reducing habitat impacts, especially within the closed area. While not expected to totally offset the positive impacts, this alternative might displace some effort to the southern edge of Georges Bank. Because the directed fishery is a bottom trawl fishery, and because the bottom habitats on the outer shelf are deeper and more vulnerable to bottom contact (less natural disturbance), this alternative could potentially have negative habitat impacts outside the RH/S areas related to increases in redistributed fishing effort.

4. Protected Resources

A positive impact would be expected for protected resources compared to the no-action alternative since effort would likely be reduced given the scope of the closed area. Reduced effort would be likely to result in less protected species interaction in the longfin squid fishery.

From an information point of view, if vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

The impacts appear mixed with uncertain net impacts compared to the no-action alternative. On one hand, as described in the table below, about 71% of longfin squid kept catch (VTR data) from 2006-2010 came from within the RH/S longfin squid Management Area. While vessels would compensate as best they could so impacts are difficult to further quantify, vessels that typically rely on longfin squid would likely experience negative economic impacts due to lost fishing revenue or costs to transit the area to a non-closed area.

Table 74. Longfin squid kept VTR catch in and out of RH/S Area

	Outside Loligo Pounds	Inside Loligo Pounds
2006	7,139,722	30,323,237
2007	16,516,551	12,991,085
2008	6,692,942	20,772,623
2009	4,352,451	17,991,543
2010	4,050,619	12,510,747
Total	38,752,285	94,589,235
%	29%	71%

Source: Unpublished VTR Data

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. However, the actual rebuilding of RH/S runs to optimally productive levels would be expected to lead to substantial positive benefits. These fisheries have supported thriving (if seasonal) commercial and recreational fisheries in the past. Public interest in this amendment demonstrates that that the general public holds a certain value for the knowledge that these fisheries are being sustainably managed, and even if each individual's value is small the total public value may be quite large. If limiting RH/S catch through this alternative set led to rebuilding then the benefits of the action alternatives would be large. If limiting RH/S catch through this alternative set did not substantially lead to rebuilding (i.e. other factors are primarily to cause for RH/S declines - see sections 6.2.5 and 6.2.6) then the benefits of the action alternatives would be minor. Future research may provide information on what factors are primarily responsible to RH/S declines but currently that information is not available.

<u>7cMack.</u> Require observers in RH/S Mackerel Management Area (applies in Quarter 1 only – see map below) for vessels with federal mackerel permits to retain more than 20,000 pounds of mackerel. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected for mackerel compared to the no-action alternative since overall effort and catch would likely be reduced given the scope of the closed area and the high costs of observer coverage. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts should be low.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. To the degree that fishermen did not fish because of the cost of the requirement, there could be benefits to non-target species because of reduced fisheries interactions. In addition, effort redistribution (including shifts of effort to other fisheries in the same area) could lead to unexpected potentially negative impacts if they ultimately increase non-target species interactions. Due to the expected overall lower effort these would not be expected to change the overall positive impact.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. There may be a reduction in mackerel fishing, but since mid-water trawl gear, which accounts for most mackerel effort, does not generally contact the bottom, there would be no benefits to benthic habitats. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts. These benefits may be offset by some bottom trawlers who decide to pursue mackerel under the incidental trip limits (to take advantage of the cut-off supply and possibly higher prices), but both shifts should be small and offsetting, suggesting a neutral and/or negligible impact.

4. Protected Resources

A positive impact would be expected for protected resources compared to the no-action alternative since effort would likely be reduced given the scope of the observer coverage area and the costs of observer coverage. Less effort should result in less protected species interactions.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

The impacts appear mixed with uncertain net impacts compared to the no-action alternative. On one hand there are costs of carrying observers relative to vessel revenues and existing costs. These are described in Section 7.5. Given the scope of the area involved, this alternative is roughly similar to requiring 100% observer coverage. If the cost of observers is too high vessels would likely shift effort to other fisheries if possible but some revenue loss is still likely if they would have preferred to mackerel fish.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since this alternative is primarily related to monitoring, the direct impacts are probably small but the reader should review similar impacts for the alternatives that deal with management measures that may utilize better data.

<u>7cLong.</u> Require observers in RH/S longfin squid Management Area (applies year round) for vessels with federal longfin squid permits to possess more than 2,500 pounds of longfin squid. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A potentially low positive impact would be expected for longfin squid compared to the no-action alternative since overall effort and catch would likely be reduced given the scope of the closed area and the high costs of observer coverage. Since taking the full quota of the directed species should not impact the sustainability of the managed resource, impacts should be low. If the longfin squid fishery is better monitored or reduced, there would likely be benefits to butterfish given the relatively high catch rates of butterfish in the longfin squid fishery.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A potentially positive impact would be expected compared to the no-action alternative. To the degree that better data is used to better minimize non-target interactions, there could be positive impacts to non-target species, including RH/S. To the degree that fishermen did not fish because of the cost of the requirement, there could be benefits to non-target species because of reduced fisheries interaction related to the lower effort. In addition, effort redistribution (including shifts of effort to other fisheries in the same area) could lead to unexpected potentially negative impacts if they ultimately increase non-target species interactions. Due to the expected overall lower effort these would not be expected to change the overall positive impact.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

However, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A potentially low positive impact would be expected compared to the no-action alternative. To the degree that fishermen did not fish because of the requirement to carry costly observers, effort would be reduced thus reducing habitat impacts. The proposed observer coverage areas for longfin squid are large enough that some overall effort reduction would likely occur, reducing habitat impacts, especially within the observer coverage area. While not expected to totally offset the positive impacts, this alternative might displace some effort to the southern edge of Georges Bank. Because the directed fishery is a bottom trawl fishery, and because the bottom habitats on the outer shelf are deeper and more vulnerable to bottom contact (less natural disturbance), this alternative could potentially have negative habitat impacts outside the RH/S areas related to increases in redistributed fishing effort.

4. Protected Resources

A positive impact would be expected for protected resources compared to the no-action alternative since effort would likely be reduced given the scope of the observer coverage area and the costs of observer coverage. Less effort should result in less protected species interactions.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

The impacts appear mixed with uncertain net impacts compared to the no-action alternative. On one hand there are costs of carrying observers relative to vessel revenues and existing costs. These are described in Section 7.5. Given the scope of the area involved, this alternative is roughly similar to requiring 100% observer coverage. If the cost of observers is too high vessels would likely shift effort to other fisheries if possible but some revenue loss is still likely if they would have preferred to fish for longfin squid.

While there are human community costs there also could be human community benefits. To the extent that these alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other non-target species, then choosing this action alternative in comparison to the no-action alternative might result in additional benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Due to the uncertainty about how the productivity of either the managed species or RH/S is impacted by current catch levels these impacts are not quantifiable. Since this alternative is primarily related to monitoring, the direct impacts are

probably small but the reader should review similar impacts for the alternatives that deal with management measures that may utilize better data.

7d. Make above requirement(s) in effect only when a mortality cap "trigger" is reached. Operation of a "trigger" would be identical to the operation of a mortality cap (see Alternative Set 6 above) but the consequence of hitting the cap would be implementing 7b and/or 7c above if this alternative is selected in conjunction with 7b and/or 7c above. Trigger levels would be specified annually via specifications.

7d would only be selected if 7bMack, 7bLong, 7cMack, or 7cLong were selected. Because under 7d those measures would only be in place for the part of the year after the cap had been achieved, 7d would reduce the biological and human community impacts described in 7bMack, 7bLong, 7cMack, or 7cLong, depending on how quickly the trigger for the fishery is attained. Those impacts are not repeated here but are described in the analysis of RH/S mortality cap in Alternative Set 6 (see Section 7.6).

7e. Stipulate that any areas designated in Amendment 14 would be considered for updating every other year in specifications considering the most recent data available when specifications are developed.

This alternative would commit the Council to re-evaluate the designated areas every other year during the specifications process. The impacts of any potential revised areas will be evaluated in the NEPA documentation for the annual specifications that considered the changes

Biological Impacts

Impacts would be uncertain depending on the outcome of the analysis.

Human Community Impacts

Impacts would be uncertain depending on the outcome of the analysis.

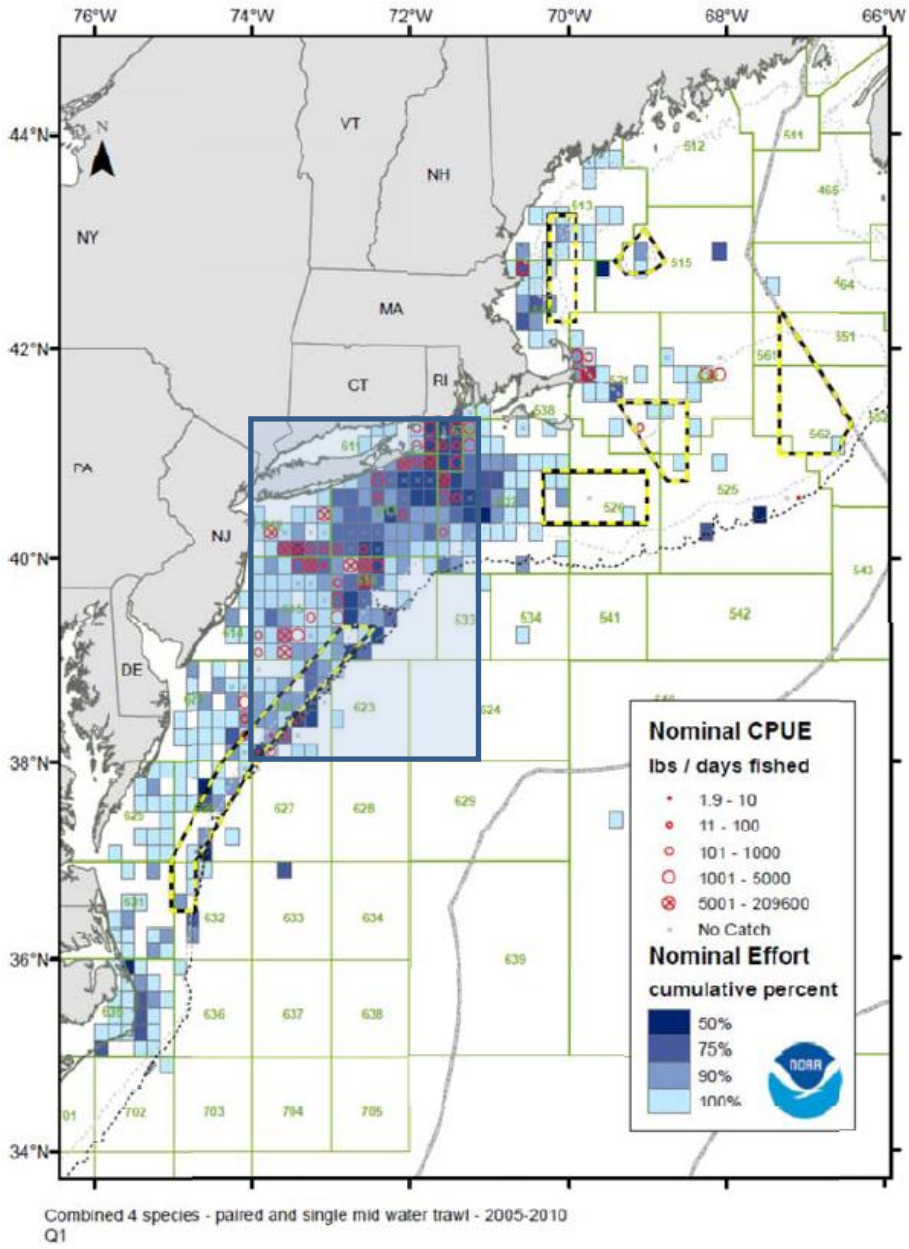
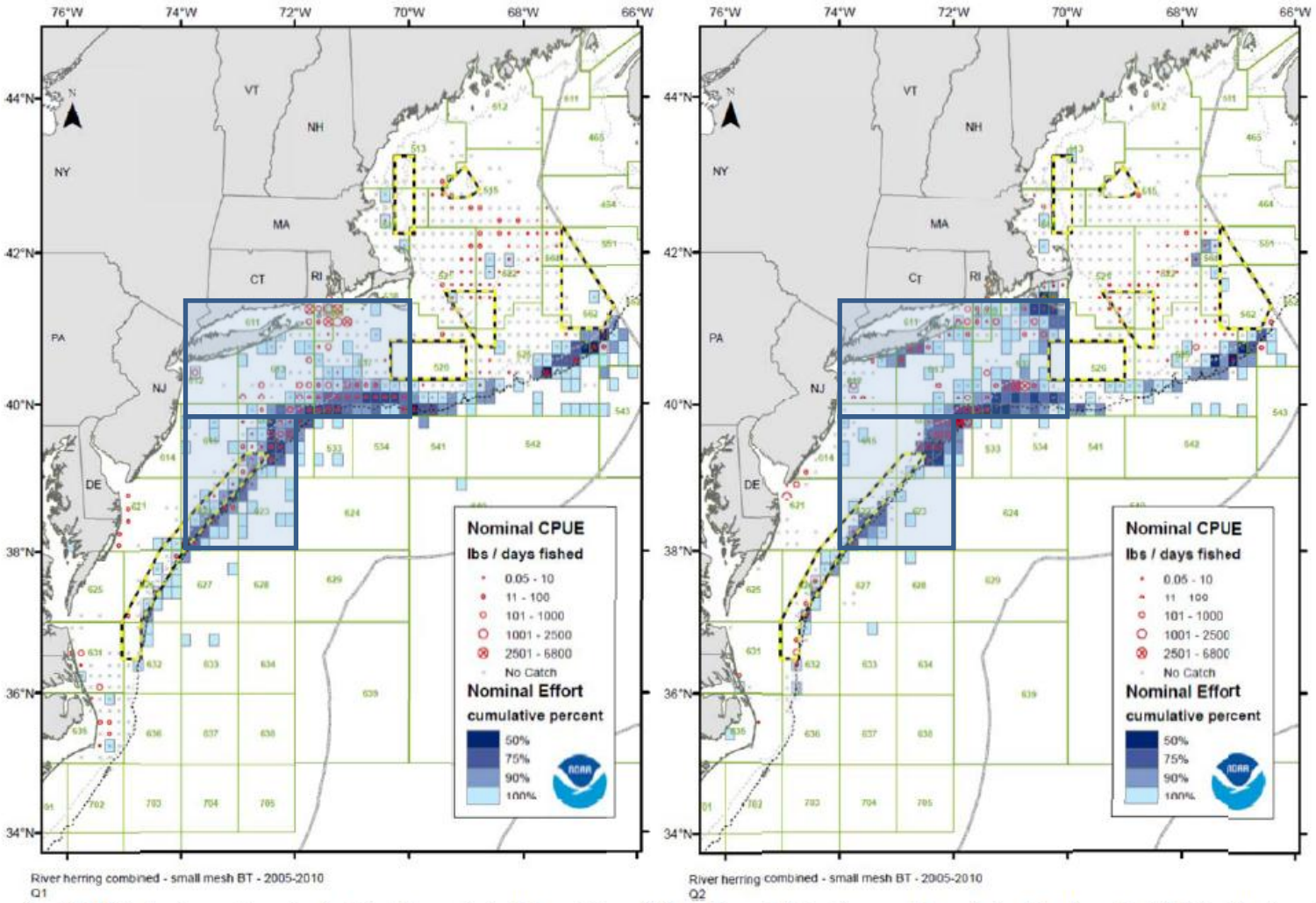
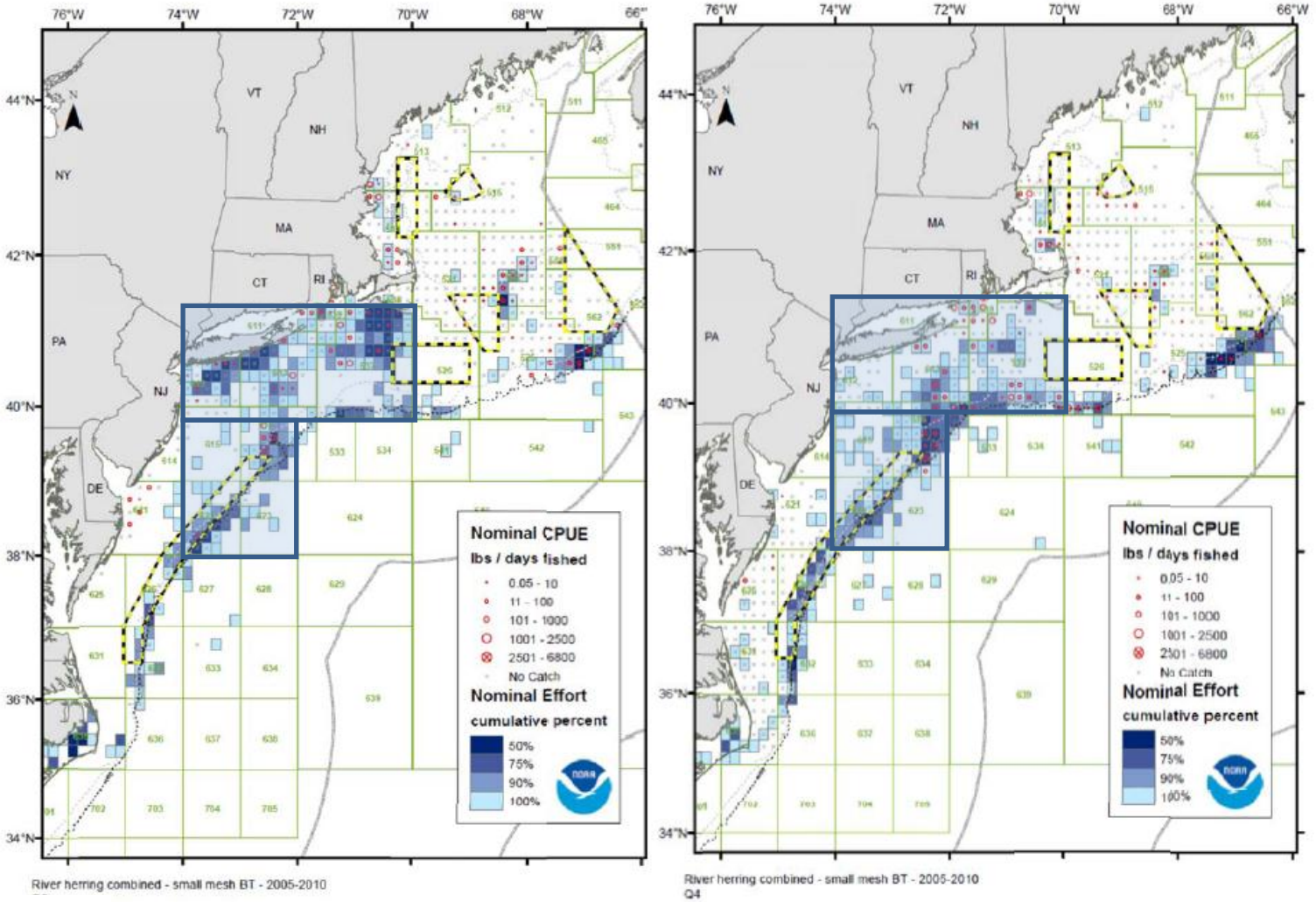


Figure 61. RH/S Mackerel Management Area (would apply in Quarter 1 only) over Quarter 1 MWT effort and RH/S Catch



Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 1 (left) and 2 (right) for 2005-2010.

Figure 62. RH/S Longfin squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 1 and 2)



Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 3 (left) and 4 (right) for 2005-2010.

Figure 63. RH/S Longfin squid Management Area over small mesh bottom effort and RH/S Catch (Quarters 3 and 4)

Alternative Set 7 Summary - Restrictions in areas of high RH/S catch

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

The action alternatives that implement large-scale area closures (7bMack and 7bLong) would have low benefits to managed species because it is likely the areas would lead to reduced total catch of the managed species because of the areas' large size and likelihood of discouraging effort. However, even achieving the full quota of the managed species should not cause sustainability concerns so impacts would be low. The alternatives that require industry-funded observer coverage in these areas (7cMack and 7cLong) would do the same (the cost of observers would discourage effort) but to a lesser degree since vessels could still fish in the area with an observer.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

The action alternatives that implement large-scale area closures (7bMack and 7bLong) would have benefits to non-target species because it is likely the areas would lead to reduced total non-target catch because of the areas' large size and likelihood of discouraging effort. The alternatives that require industry-funded observer coverage in these areas (7cMack and 7cLong) would do the same (the cost of observers would discourage effort) but to a lesser degree since vessels could still fish in the area with an observer. RH/S impacts would be higher (more positive) with the mackerel measures since the mackerel fishery appears to catch more RH/S than the longfin squid fishery.

3. Habitat Impacts Including EFH

To the degree effort was reduced, habitat impacts would also be reduced, with longfin squid effort reductions being more important since they predominantly use bottom otter trawls. The closures would probably reduce effort more than the observer coverage requirements as discussed above.

4. Protected Resources

To the degree effort was reduced, protected resource impacts would also be reduced. The closures would probably reduce effort more than the observer coverage requirements as discussed above.

5. Human Communities

Human community impacts are mixed depending on which interest group is considered. Commercial participants could incur high costs for all alternatives related to forgone revenues due to large area closures and/or high observer costs. The interested public would benefit to the extent that lower catch helped rebuild RH/S stocks (which is highly uncertain).

Comparison of Alternative Sets 7 and 8

As stated above, given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery. There are some hotspot areas north of Cape Cod that are not covered by Alternative Set 7's larger areas but there is relatively low mackerel and/or longfin squid activity in those areas at the relevant times of the year. Because of Alternative Set 8's small areas (hotspots) the difference in terms of impacts are not expected to be proportionally less for Set 8 compared to Set 7. Rather, Set 8 would be expected to have negligible impacts across resource types due to fishery participants' abilities to redistribute effort, which could not occur to the same degree with Set 7 given how large the areas are in Set 7.

7.8 Alternative Set 8 – Hotspot Restrictions

The New England Fishery Management Council developed a variety of "Hotspot" alternatives in Amendment 5 to the Atlantic Herring Plan. All of the areas contemplated are relatively small and consider different restrictions within the hotspots. Since Atlantic herring and mackerel are often targeted by the same vessels and are sometimes targeted together at the same time, it makes sense to consider these alternatives even though they were based on observer data from "herring trips" as defined below.

The smallest areas are termed "River Herring Protection Areas." These Protection Areas were 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 during the respective 2-month period. The protection areas include just the portion of the monitoring/avoidance areas (described below) that have the highest river herring catches on Atlantic herring trips as defined above. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Protection Area versus other areas in a given year.

Slightly larger areas are termed "River Herring Monitoring/Avoidance Areas." These Monitoring/Avoidance Areas were 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 during the respective 2-month period. They include all of the area identified in the protection areas as well is areas where a more modest amount of river herring was caught. Since the raw observer data were pooled across years, the threshold was only one tow, and the results are only from Herring Trips, they do not reflect how much total river herring was caught in the Monitoring/Avoidance Areas versus other areas in a given year.

These protection and monitoring/avoidance areas are mapped below by their respective bi-monthly periods. Since seeing them on the same page clarifies the differences among the areas,

they are illustrated together below (where applicable). Management measures that could apply to these areas follow the maps.

NOTE ON COMBINATIONS: All of the action alternatives in the set could be adopted individually or together. 8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen.

Given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery.

The enforceability of area-based management alternatives could be facilitated by the selection of the vessel monitoring system (VMS) requirement in Alternative Set 1 (alternatives 1eMack or 1eLong).

The selection of alternatives that include observer coverage requirements (8cMack and 8cLong) would require the selection of observer program notification alternatives for limited access mackerel permits in Alternative Set 1(1d48 and 1d72).

If an overall observer coverage requirement in Alternative Set 5 was selected but did not result in a trip covered by an alternative in this Alternative Set having an observer, this Alternative Set would effectively require additional coverage.

When comparing alternatives relative to the mackerel fishery or the longfin squid fishery, the mackerel alternatives are likely to have a greater positive impact on RH/S because substantially more RH/S appear to be caught in the mackerel fishery, but it is not possible to quantify the differential in potential benefits.

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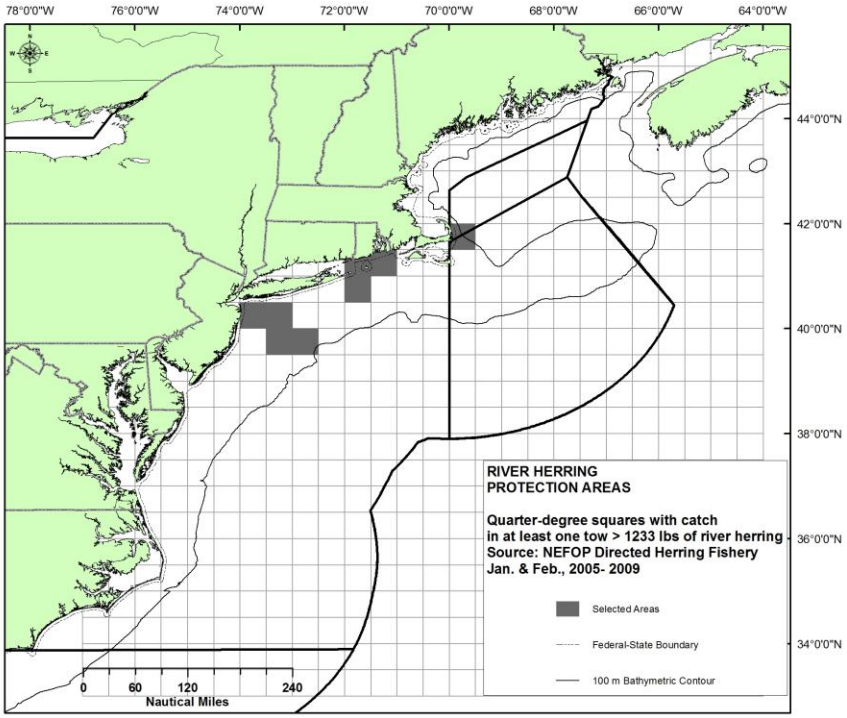
Figure 64.January – February Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

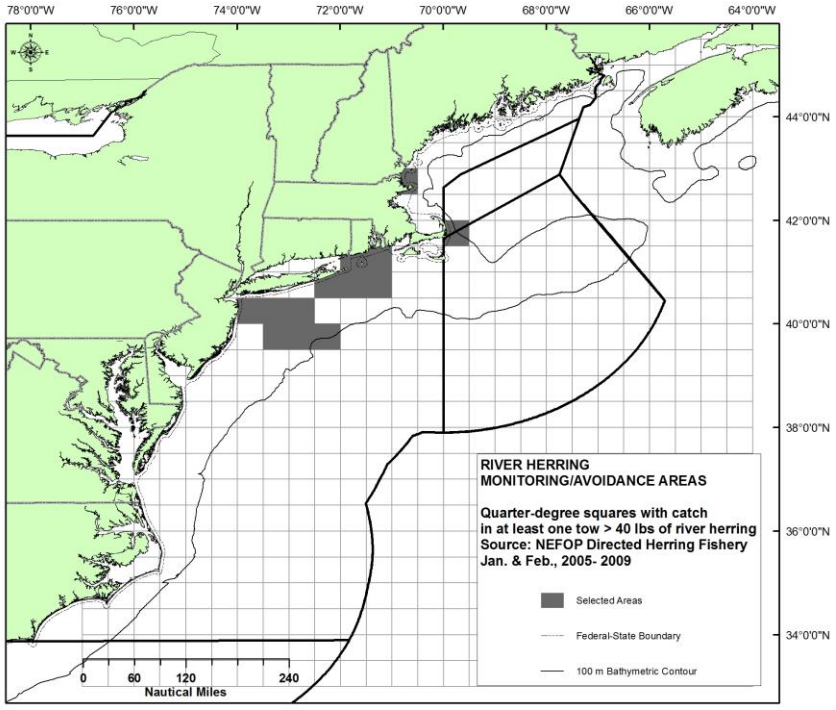
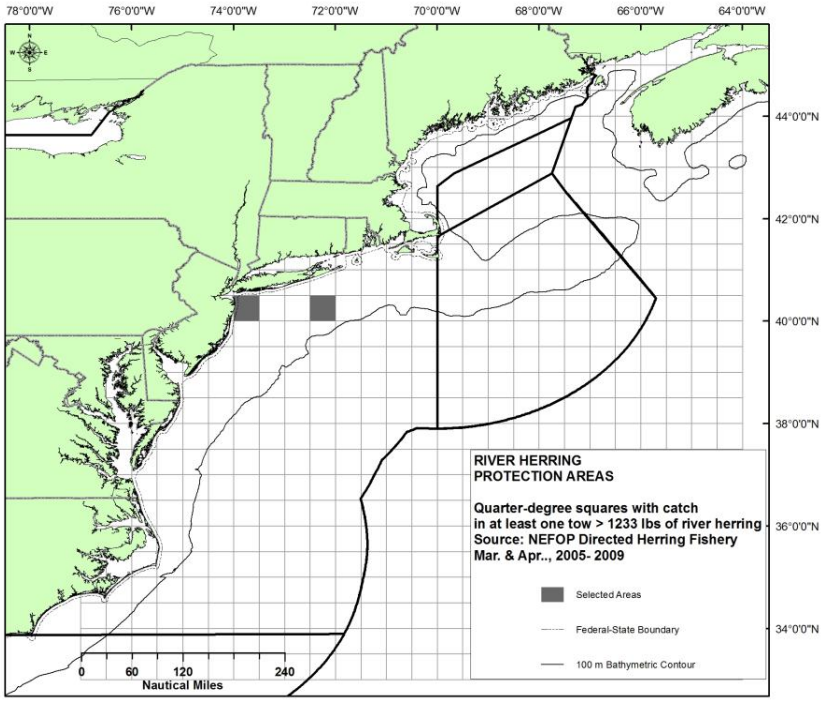


Figure 65.March – April Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

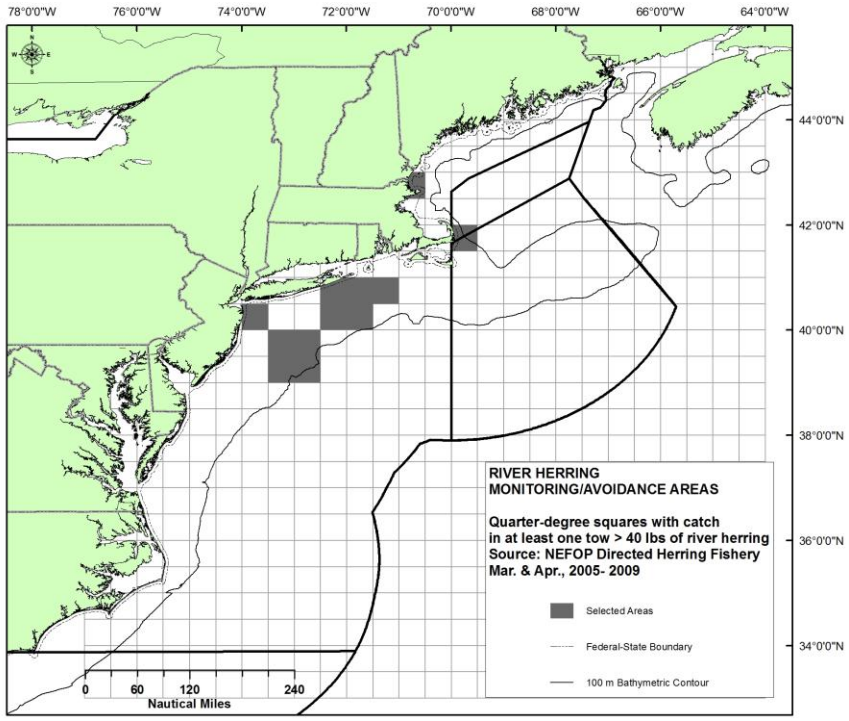


Figure 66.May – June Herring Area

Protection Area

None proposed – there were no qualifying observer records (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).

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Monitoring/Avoidance Area

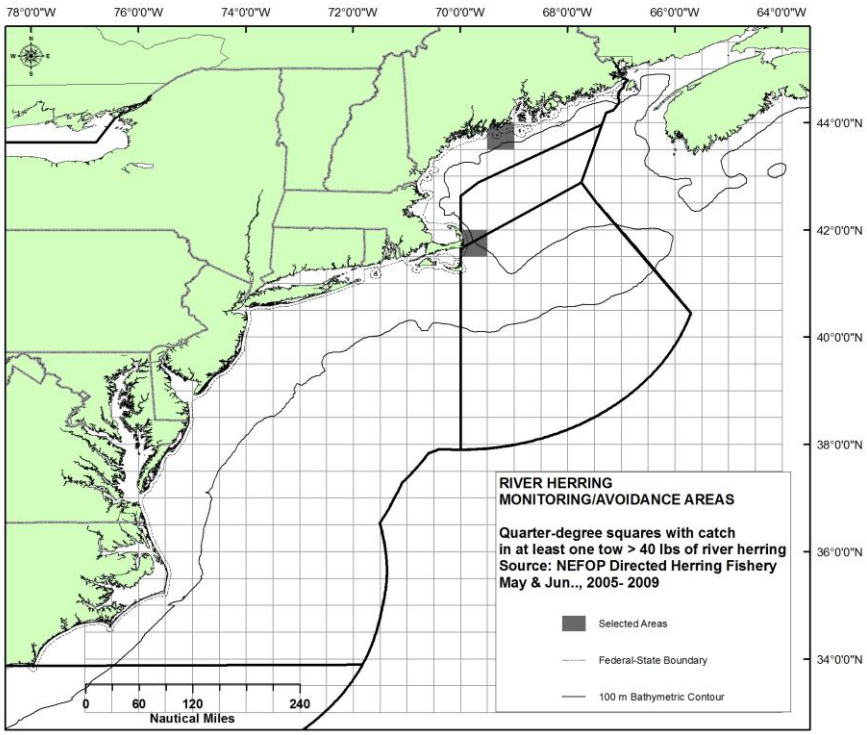

Figure 67. <u>July – August Herring Area</u>

<u>Protection Area</u>

None proposed – there were no qualifying observer records (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).

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<u>Monitoring/Avoidance Area</u>

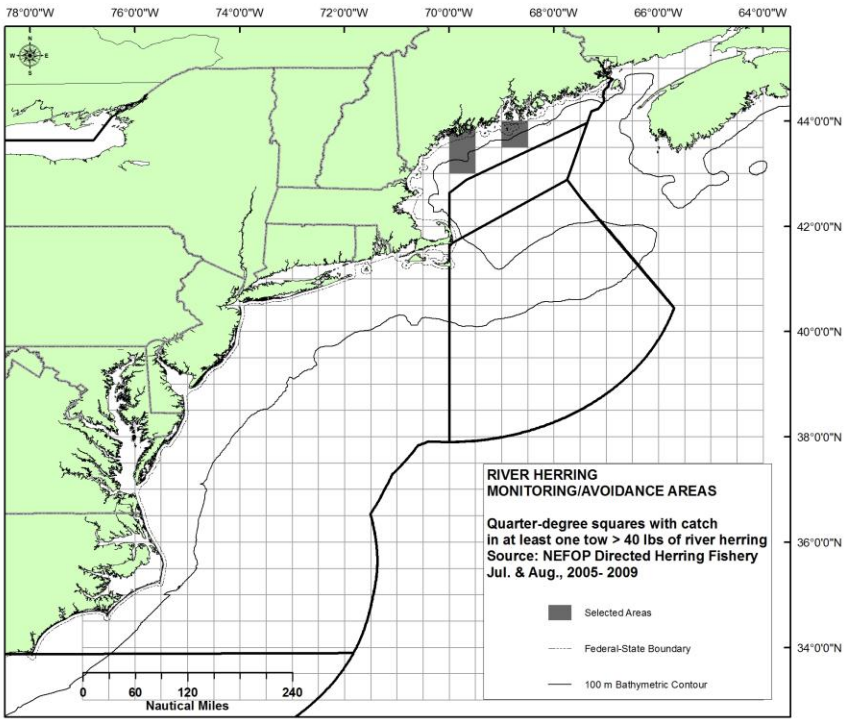
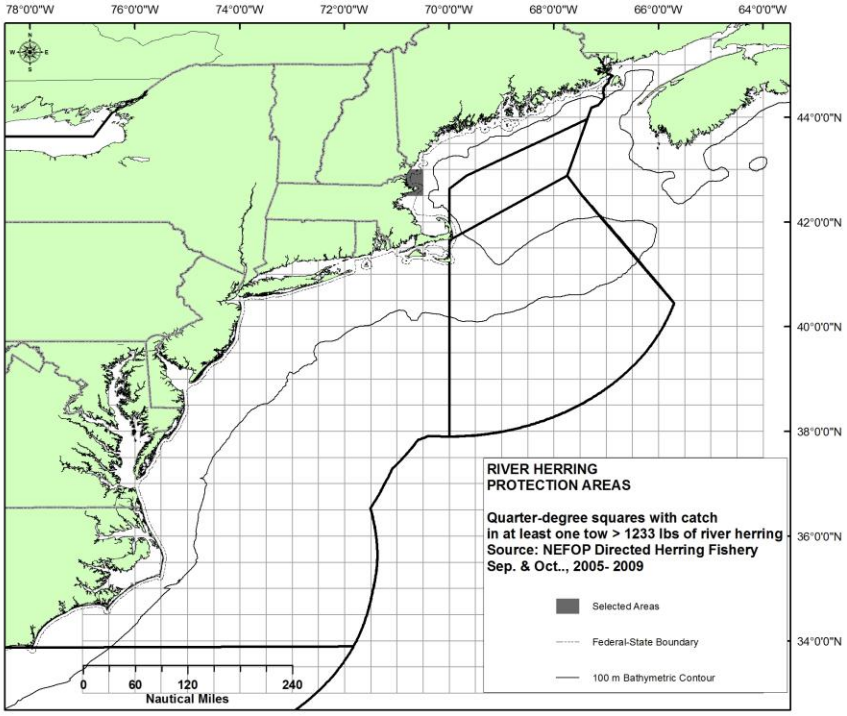


Figure 68.September – October Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area

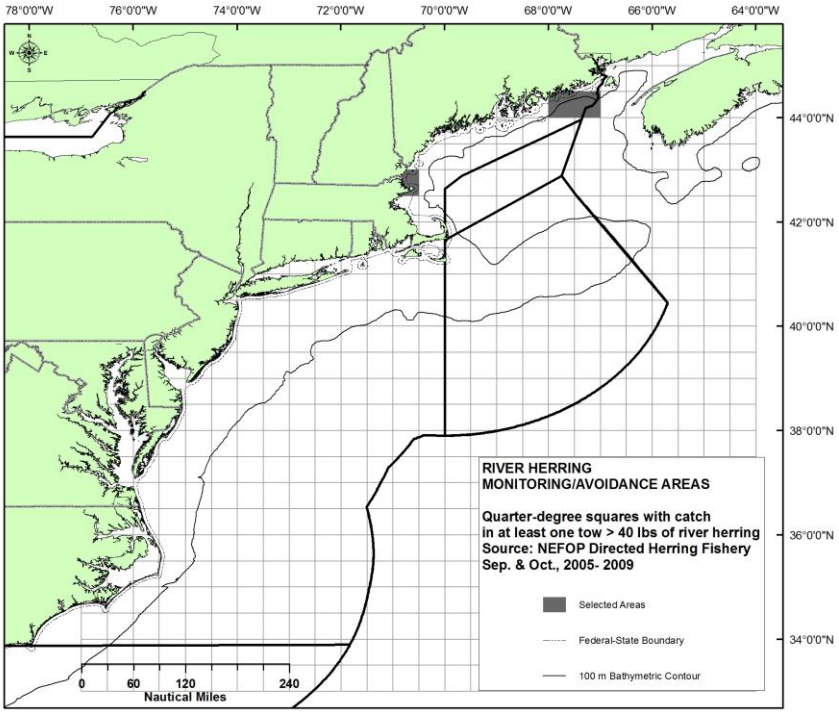
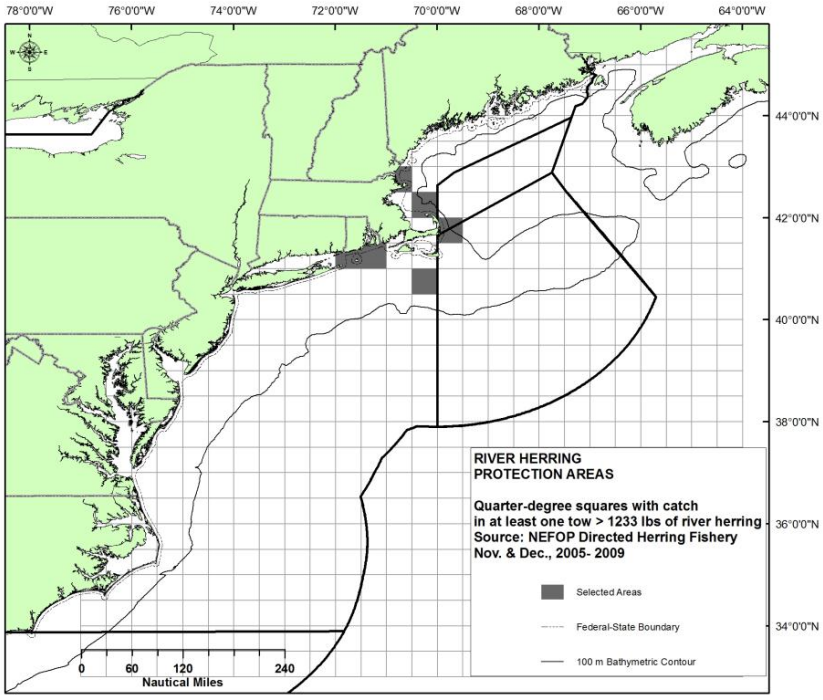
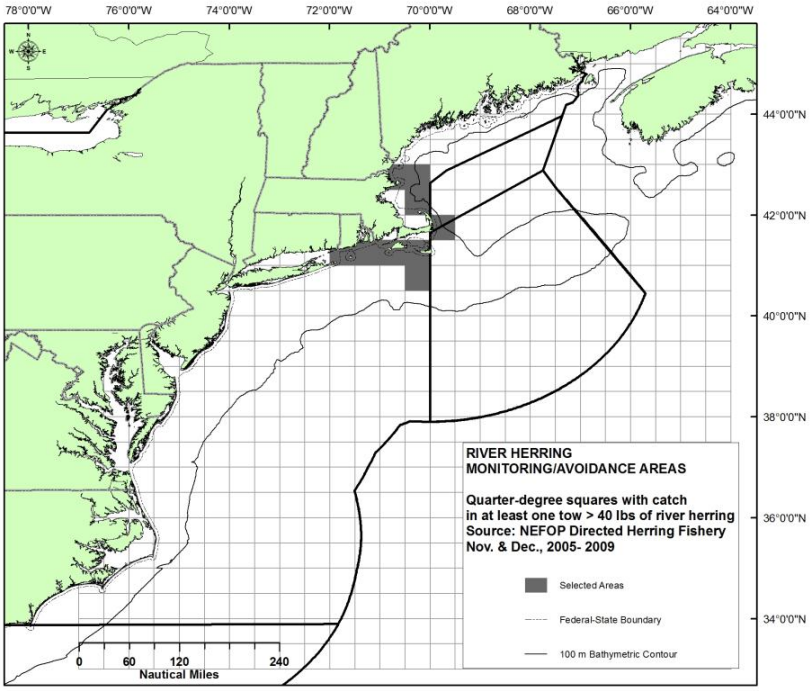


Figure 69.November – December Herring Area

Protection Area (highest catch records from Monitoring/Avoidance Area)



Monitoring/Avoidance Area



Management Measures

8a. No-action

If this alternative is selected, then no measures from Alternative Set 8 would be implemented and the existing state management measures (as described in section 5.9) would remain in place. Thus there would be no incremental impacts compared to the status quo, but there are relative impacts compared to the action alternatives, as described below. While this section focuses on incremental impacts, cumulative impacts are discussed in Section 8.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A neutral or negligible impact would be expected compared to the action alternatives. Vessels will continue to target the managed resource across all current fishing areas. While the action alternatives may cause vessels to redirect fishing effort to other locations or managed fisheries, the proposed areas are relatively small for each bimonthly area so it is not expected that catches of the managed resources would change substantially with the proposed areas in place due to the highly migratory nature of the managed species. Because the proposed areas are not likely to impact the managed resource, the impacts of maintaining the status quo will also be neutral or negligible. For options that require observer coverage in hotspots, if vessels still fish in those areas, more information would be gained so not obtaining that information would be a forgone benefit. If overall observer coverage levels are steady, closing areas results in more information outside of the areas and less information inside the areas, so the no-action results in more information inside the areas and less information outside the areas.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A neutral or negligible impact would be expected compared to the action alternatives. Vessels will continue to target the managed resource across all current fishing areas. While the action alternatives may cause vessels to redirect fishing effort to other locations or managed fisheries, the proposed areas are relatively small and the distributions of most of the non-target species that interact with the managed resources are wide and variable. Because of this, small scope seasonal closures are not expected to reduce the rate of non-targets species interactions in the proposed areas beyond the level of non-target species interactions across current fishing areas. Because the proposed areas are not likely to impact the frequency of non-target resource interactions, the impacts of maintaining the status quo will also be neutral or negligible. If the areas happened to have higher RH/S catch rates then the no action would not redirect effort away from those areas and would be a negative impact for RH/S. If the areas happened to have lower RH/S catch rates then the no action would not redirect effort away from those areas and there would be a positive impact for RH/S, but the year to year variability in RH/S movement means that there may be negligible impacts over time.

For options that require observer coverage in hotspots, if vessels still fish in those areas, more information would be gained so not obtaining that information would be a forgone benefit. If overall observer coverage levels are steady, closing areas results in more information outside of the areas and less information inside the areas, so the no-action results in more information inside the areas and less information outside the areas.

3. Habitat Impacts Including EFH

A neutral or negligible impact overall impact would be expected compared to the action alternatives. With mackerel most effort is with mid-water gear so moving effort from one location to another should not impact habitat. For longfin squid, the no-action alternative would result in no change in fishing effort across areas. The action alternatives would decrease effort inside the hotspots (a positive for habitat there) but increase effort outside the hotspots (a negative for habitat there). So the no-action alternative would result in positive impacts for habitat outside the hotspots (by not redirecting effort there) and would result in negative impacts for habitat inside the hotspots (by not redirecting effort away from there). Overall however, there is no information to suggest that there would be a net change in effort and habitat impacts, just a redistribution. And since the areas are relatively small, the redistribution of effort should be relatively small, with negligible impacts between the no action and action alternatives.

4. Protected Resources

A neutral or negligible impact would be expected compared to the action alternatives. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that the new areas would be substantially different than the old areas in terms of protected resources or protected resource interactions.

If additional information on protected resources interactions could be gained through options that increase observer coverage and sampling (CA I provisions) on trips to RH/S areas, then selecting the no action results in less available information. If overall observer coverage levels are steady, closing areas results in more information outside of the areas and less information inside the areas, so the no-action results in more information inside the areas and less information outside the areas.

Since overall effort is not expected to change given the small size of the areas, closing areas would result in a redistribution of effort, so not closing the areas (no action) means there would be more interactions inside the areas and less interactions outside the areas but probably negligible overall impacts.

5. Human Communities

There are low negative socio-economic impacts for the action alternatives that would be avoided by choosing the no-action alternative compared to the status quo. These avoided impacts include costs of observers (8c), additional operational costs to leave an area after a slippage event (8d),

and additional operational costs if a vessel decided to travel to more distant areas rather than fish in one of the proposed hotspots (8c, 8d, 8e).

8b. Make implementing area-based "hotspot closures" to reduce catches (similar to those considered in NEFMC's Amendment 5 to the Atlantic Herring Plan) frameworkable. (PREFERRED)

The Council would make the hotspot requirements considered below frameworkable under a subsequent action. Biological and Socioeconomic considerations would be reevaluated when any framework was developed and would depend on the exact measures considered. Impacts would be analyzed at the time of framework consideration. No immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

8cMack. For Atlantic mackerel permitted vessels, more than an incidental level of fish (20,000 pounds mackerel) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere than the Monitoring/Avoidance Area with the action alternative but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that catches of the managed resources would be substantially impacted overall, especially given the wide distribution and migratory nature of the managed species, leading to high inter-annual variability in availability. There might be lower catches inside the area if this alternative was implemented, but higher catches outside due to effort displacement for a negligible net change because the areas are relatively small, affording vessels the opportunity to shift fishing effort and maintain level catches of the managed species.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

3. Habitat Impacts Including EFH

A neutral or negligible impact overall impact would be expected compared to the no-action alternatives. With mackerel most effort is with mid-water gear so moving effort from one location to another should not impact habitat. Even for the bottom-trawl effort for mackerel, the action alternative would probably result in no change in net fishing effort across areas. The action alternatives would decrease effort inside the hotspots (a positive for habitat there) but increase effort outside the hotspots (a negative for habitat there). Overall however, there is no information to suggest that there would be a net change in effort and habitat impacts, just a redistribution. And since the areas are relatively small, the redistribution of effort should be relatively small, with negligible impacts between the no action and action alternatives.

4. Protected Resources

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of protected resource impacts given the wide distribution and high inter-annual variability of most protected resources. If effort is displaced from a small area, there might be lower interactions inside the area but higher interactions outside for a zero net change, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected

outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

A low negative impact would be expected compared to the no-action alternative. Participants would either have to pay to take an observer aboard ($800/day), raising mackerel trip costs by 23%-49% (see section 7.5 for analysis of observer cost compared to average mackerel revenues), or avoid fishing in the proposed areas. Conservation benefits are unlikely to be large based on the biological impact sections above. Given the small size of the areas, vessels are more likely to avoid the areas altogether rather than pay for costly observer coverage. Thus, because vessels are likely to decide not to fish in these areas, they have the potential to not incur costs for observer coverage, so impacts would likely be low. However, near-shore fishermen near the closed areas may be disproportionately impacted by closures around their home port, having to incur costs by traveling away from these areas.

<u>8cLong</u>. For longfin squid permitted vessels, more than an incidental level of fish (2,500 pounds longfin squid) may not be retained/transferred/ possessed if any fishing occurs in a River Herring Monitoring/Avoidance Area without a NMFS-approved observer at any point during the trip. Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries).

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere than the Monitoring/Avoidance Area with the action alternative but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that catches of the managed resources would be substantially impacted overall, especially given the wide distribution and migratory nature of the managed species, leading to high inter-annual variability in availability. There might be lower catches inside the area if this alternative was implemented, but higher catches outside due to effort displacement for a negligible net change because the areas are relatively small, affording vessels the opportunity to shift fishing effort and maintain level catches of the managed species.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then more information is gained related to the observer requirement which is a potentially positive impact. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

Also, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A neutral or negligible impact overall impact would be expected compared to the no-action alternatives. Even for the bottom-trawl effort, the action alternative would probably result in no change in net fishing effort across areas. The action alternatives would decrease effort inside the hotspots (a positive for habitat there) but increase effort outside the hotspots (a negative for habitat there). Overall however, there is no information to suggest that there would be a net change in effort and habitat impacts, just a redistribution. And since the areas are relatively small, the redistribution of effort should be relatively small, with negligible impacts between the no action and action alternatives.

4. Protected Resources

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would

not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of protected resource impacts given the wide distribution and high inter-annual variability of most protected resources. If effort is displaced from a small area, there might be lower interactions inside the area but higher interactions outside for a zero net change, especially since the areas are relatively small.

5. Human Communities

A low negative impact would be expected compared to the no-action alternative. Participants would either have to pay to take an observer aboard ($800/day), raising longfin squid trip costs by 85%-189% (see section 7.5 for analysis of observer cost compared to average longfin squid trip revenues), or avoid fishing in the proposed areas. Conservation benefits are unlikely to be large based on the biological impact sections above. Given the small size of the areas, vessels are more likely to avoid the areas altogether rather than pay for costly observer coverage. Thus, because vessels are likely to decide not to fish in these areas, they have the potential to not incur costs for observer coverage, so impacts would likely be low. However, near-shore fishermen near the closed areas may be disproportionately impacted by closures around their home port, having to incur costs by traveling away from these areas.

8dMack. If a mackerel-permitted vessel is fishing in any River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 section 5.8), 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.

As described in 5.8, if vessels do slip hauls in a monitoring/avoidance area they would be required to leave the monitoring/avoidance area for the duration of their trip.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact the managed resources compared to the no-action alternative since total catch of the managed resources is not likely to be substantially impacted. Even if fishing activity is displaced from these areas, since the managed species are widely distributed and the areas are relatively small, substantial changes in overall catch would not be expected.

From an information point of view, most of the managed species are already brought on board for sampling/inspection so related impacts would be negligible if vessels still fish in these areas. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered. Also, most fish are already brought on board for inspection.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

If vessels continue to fish in these areas, a requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact non-target species (including RH/S) compared to the no-action alternative since the fishing activity would continue. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then better data would be collected because all caught fish would be inspected. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere rather than be subject to these requirements in these areas but since the majority of mackerel landings are made with mid-water gear, which generally does not contact the bottom, any redirection or displacement of mackerel effort due to this alternative would not be expected to have any impacts on habitat. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts.

4. Protected Resources

If vessels continue to fish in these areas, a requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact protected resources compared to the no-action alternative since the fishing activity would continue. If vessels just fish elsewhere, there would be lower interactions inside the areas but higher interactions outside the areas. Since the areas are relatively small it would not be expected that overall effort would change, and while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that the new areas would be substantially different than the old areas in terms of protected resources or protected resource interactions, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then better data would be collected because all caught fish would be inspected for protected resources. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside

the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

A requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to substantially impact human communities compared to the no-action alternative since most fish are brought on board already and because the areas are relatively small relative to the wide distribution of fishing activity for the managed resources. Some loss of revenue and/or additional costs may accrue if a vessel has to leave an area after a slippage event but given the relatively small areas involved it is likely that fishermen will be able to react to keep any economic losses relatively low.

8dLong. If a longfin squid-permitted vessel is fishing in a River Herring Monitoring/Avoidance Areas identified in this alternative with an observer onboard, vessels would be required to pump/haul 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 section 5.8), 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.

As described in 5.8, if vessels do slip hauls in a monitoring/avoidance area they would be required to leave the monitoring/avoidance area for the duration of their trip.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact the managed resources compared to the no-action alternative since total catch of the managed resources is not likely to be substantially impacted. Even if fishing activity is displaced from these areas, since the managed species are widely distributed and the areas are relatively small, changes in overall catch would not be expected.

From an information point of view, most of the managed species are already brought on board for sampling/inspection so related impacts would be negligible if vessels still fish in these areas. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

If vessels continue to fish in these areas, a requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact non-target species (including RH/S) compared to the no-action alternative since the fishing activity would continue. Vessels may fish elsewhere with the action alternatives but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then better data would be collected because all caught fish would be inspected. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

Also, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A neutral or negligible impact overall impact would be expected compared to the no-action alternatives. Even for the bottom-trawl effort, the action alternative would probably result in no change in net fishing effort across areas. The action alternatives might decrease effort inside the hotspots (a positive for habitat there) but increase effort outside the hotspots (a negative for habitat there). Overall however, there is no information to suggest that there would be a net change in effort and habitat impacts, just a redistribution. And since the areas are relatively small, the redistribution of effort should be relatively small, with negligible impacts between the no action and action alternatives.

4. Protected Resources

If vessels continue to fish in these areas, a requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to impact protected resources compared to the no-action alternative since the fishing activity would continue. If vessels just

fish elsewhere, there would be lower interactions inside the areas but higher interactions outside the areas. Since the areas are relatively small it would not be expected that overall effort would change, and while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that the new areas would be substantially different than the old areas in terms of protected resources or protected resource interactions, especially since the areas are relatively small.

From an information point of view, if vessels still fish in these areas then better data would be collected because all caught fish would be inspected for protected resources. If vessels just avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

A requirement to bring all fish on board for inspection when observers are onboard in these areas would not be expected to substantially impact human communities compared to the no-action alternative since most fish are brought on board already and because the areas are relatively small relative to the wide distribution of fishing activity for the managed resources. Some loss of revenue and/or additional costs may accrue if a vessel has to leave an area after a slippage event but given the relatively small areas involved it is likely that fishermen will be able to react to keep any economic losses relatively low.

<u>8eMack</u>. Vessels possessing a federal mackerel permit would not be able to retain, possess or transfer more than an incidental level of fish (20,000 pounds mackerel) while in a River Herring <u>Protection Area</u> unless no mesh smaller than 5.5 inches is onboard the vessel.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A neutral or negligible impact would be expected compared to the no-action alternative. While there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that catches of the managed resources would be substantially impacted overall, especially given the wide distribution and migratory nature of the managed species, leading to high inter-annual variability in availability. There might be lower catches inside the area if this alternative was implemented, but higher catches outside due to effort displacement for a negligible net change because the areas are relatively small, affording vessels the opportunity to shift fishing effort and maintain level catches of the managed species.

From an information point of view, if overall observer coverage is level, more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered, especially since the areas are relatively small.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A neutral or negligible impact would be expected compared to the no-action alternative. While there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, assuming vessels avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere rather than in these areas but since the majority of mackerel landings are made with mid-water gear, which generally does not contact the bottom, any redirection or displacement of mackerel effort due to this alternative would not be expected to have any impacts on habitat. There is some directed bottom trawling for mackerel but not enough for there to be more than negligible impacts.

4. Protected Resources

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change or that the new areas would be substantially different than the old areas in terms of protected resources or rates of protected resource interactions. Thus while there may be fewer interactions inside the areas, there may be more interactions outside the areas, probably with negligible net impacts since the areas are relatively small.

From an information point of view, assuming vessels avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

A low negative impact would be expected compared to the no-action alternative. If the protection areas overlap with productive fishing areas in a given year, revenues may be decreased or fishermen may incur higher costs traveling to other fishing areas. Given the complexity of fishermen’s responses to regulations and given the protection areas are relatively small, the effects may not be substantial for most fishermen in most years compared to the no-

action alternative. However, near-shore fishermen near the closed areas may be disproportionately impacted by closures around their home port. Given where and when the mackerel and longfin squid fisheries are conducted, mackerel participants are more likely to be impacted than longfin squid participants, who tend to fish offshore in the winter months.

8eLong. Vessels possessing a federal moratorium longfin squid permit would not be able to retain, possess or transfer 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.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

A neutral or negligible impact would be expected compared to the no-action alternative. While there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that catches of the managed resources would be substantially impacted overall, especially given the wide distribution and migratory nature of the managed species, leading to high inter-annual variability in availability. There might be lower catches inside the area if this alternative was implemented, but higher catches outside due to effort displacement for a negligible net change because the areas are relatively small, affording vessels the opportunity to shift fishing effort and maintain level catches of the managed species.

From an information point of view, if overall observer coverage is level, more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered, especially since the areas are relatively small.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

A neutral or negligible impact would be expected compared to the no-action alternative. While there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change nor would it be expected that the new areas would be substantially different than the old areas in terms of non-target impacts (including RH/S) given the wide distribution and high inter-annual variability of most non-target species' availability, including RH/S (see appendices 1 and 2). If effort is displaced from a small area, there might be lower catches inside the area but higher catches outside for a zero net change, especially since the areas are relatively small.

From an information point of view, assuming vessels avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

Also, targeting information collected by NEFOP observers suggests that only a small portion of small mesh bottom trawl catches of RH/S are actually from longfin squid-targeted tows with herring accounting for most followed by mackerel and silver hake. While these are not

extrapolated catches, and target species is self-reported to observers prior to each tow, on a relative basis the information suggests that the longfin squid fishery may not actually be accounting for that much RH/S catch, which is consistent with the directed-trip based analysis conducted annually for the specifications' environmental assessment (provided above in section 6.3).

3. Habitat Impacts Including EFH

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere rather than in these areas but since the areas are relatively small, while there may be some redirection or displacement of longfin squid fishing effort due to this alternative, it would not be expected that the new areas would be substantially different than the old areas in terms of habitat and/or habitat impacts.

4. Protected Resources

A neutral or negligible impact would be expected compared to the no-action alternative. Vessels may fish elsewhere but since the areas are relatively small, while there may be some redirection or displacement of fishing effort due to this alternative, it would not be expected that total effort would change or that the new areas would be substantially different than the old areas in terms of protected resources or rates of protected resource interactions. Thus while there may be fewer interactions inside the areas, there may be more interactions outside the areas, probably with negligible net impacts since the areas are relatively small.

From an information point of view, assuming vessels avoid these areas and observer coverage is steady, then more information would be collected outside the areas and less information would be collected inside the area for probably no net change in the value of information gathered.

5. Human Communities

A low negative impact would be expected compared to the no-action alternative. If the protection areas overlap with productive fishing areas in a given year, revenues may be decreased or fishermen may incur higher costs traveling to other fishing areas. Given the complexity of fishermen's responses to regulations and given the protection areas are relatively small, the effects may not be substantial for most fishermen in most years compared to the no-action alternative. However, near-shore fishermen near the closed areas may be disproportionately impacted by closures around their home port. Given where and when the mackerel and longfin squid fisheries are conducted, mackerel participants are more likely to be impacted than longfin squid participants, who tend to fish offshore in the winter months.

8f. Make the above measures 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong only effective if/when they are effective for Atlantic Herring vessels, including if they become effective in the middle of a season because a catch-cap based trigger is reached by the

Atlantic Herring fleet under a trigger established by Amendment 5 to the Atlantic Herring FMP.

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen. The effect of 8f is essentially that the Hotspot alternatives would only be implemented if they are also implemented for Atlantic herring in a kind of light-switch on-off fashion. Thus the impact of 8f is the same as the action alternatives described above if the measures also apply to Atlantic herring and it is the same as the no-action alternative if no hotspot measures are implemented for Atlantic herring.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen. The effect of 8f is essentially that the Hotspot alternatives would only be implemented if they are also implemented for Atlantic herring in a kind of light-switch on-off fashion. Thus the impact of 8f is the same as the action alternatives described above if the measures also apply to Atlantic herring and it is the same as the no-action alternative if no hotspot measures are implemented for Atlantic herring.

3. Habitat Impacts Including EFH

8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen. The effect of 8f is essentially that the Hotspot alternatives would only be implemented if they are also implemented for Atlantic herring in a kind of light-switch on-off fashion. Thus the impact of 8f is the same as the action alternatives described above if the measures also apply to Atlantic herring and it is the same as the no-action alternative if no hotspot measures are implemented for Atlantic herring.

4. Protected Resources

8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen. The effect of 8f is essentially that the Hotspot alternatives would only be implemented if they are also implemented for Atlantic herring in a kind of light-switch on-off fashion. Thus the impact of 8f is the same as the action alternatives described above if the

measures also apply to Atlantic herring and it is the same as the no-action alternative if no hotspot measures are implemented for Atlantic herring.

5. Human Communities

8f, which would make any of the requirements selected in this Alternative Set only applicable when the same measures were in effect for the Atlantic Herring fishery, would thus only be chosen if at least one alternative among 8cMack, 8cLong, 8dMack, 8dLong, 8eMack, or 8eLong was also chosen. The effect of 8f is essentially that the Hotspot alternatives would only be implemented if they are also implemented for Atlantic herring in a kind of light-switch on-off fashion. Thus the impact of 8f is the same as the action alternatives described above if the measures also apply to Atlantic herring and it is the same as the no-action alternative if no hotspot measures are implemented for Atlantic herring.

Alternative Set 8 Summary - Hotspot Restrictions

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

The alternatives in this section, for either mackerel or longfin squid, and inside the so called "hotspots", would either require observers for catches greater than incidental levels ("8c" alternatives), prohibit slippage ("8d" alternatives), or require the use of mesh greater than 5.5 inches for catches greater than incidental levels ("8e" alternatives). 8b would make such alternatives frameworkable and 8f would make such alternatives effective only when similar measures were in effect for the Atlantic Herring fishery. None of these alternatives are expected to substantially affect the managed resources because the hotspot areas are small while the managed resources are widely distributed and migrate throughout the coastal and shelf waters of the Mid-Atlantic and northeast U.S. coast. While there may be less fish caught within a hotspot, total catch is not expected to be substantially impacted – fishing effort and catch may be redistributed slightly but not reduced overall. Also, while more or less information may be collected within a hotspot because of these alternatives depending on fishery participant behavior, overall information quantity and quality is not likely to change because of the small areas impacted.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

As with the managed resources, while fishing effort may be redistributed slightly it is not expected to be reduced overall, which means that no substantial impacts are expected on non-target species including RH/S. While the so-called hotspots do contain areas of relatively higher RH/S catch, they are also generally the areas of higher effort and redistributing effort may just result in new hotspots. The nature of within-year and inter-annual variability of RH/S distributions (see appendices 1 and 2) does not support a conclusion that limiting fishing access to the hotspots is likely to reduce overall RH/S catches, though it would likely reduce catch

within the hotspot. Also, while more or less information may be collected within a hotspot because of these alternatives depending on fishery participant behavior, overall information quantity and quality is generally not likely to change because of the small areas impacted. The alternatives to reduce slippage (8d) could improve observer data if vessels keep fishing in the hotspot areas.

3. Habitat Impacts Including EFH

Since the action alternatives are likely to involve only relatively minor re-distributions of effort related to the small area-based observer requirements, area-based slippage prohibitions, or area-based gear requirements, negligible impacts are expected.

4. Protected Resources

Since the action alternatives are likely to involve only relatively minor re-distributions of effort related to the small area-based observer requirements, area-based slippage prohibitions, or area-based gear requirements, negligible impacts are expected.

5. Human Communities

Commercial participants would have to re-distribute their effort to some degree but could probably adjust with relatively low costs. However, smaller operations located near the closed areas could be disproportionately impacted in that they could have to travel beyond the relevant restricted areas. Minimal benefits related to conservation gains would be expected due to the lack of expected overall conservation improvements.

Comparison of Alternative Sets 7 and 8

As stated above, given the overlapping nature of Alternative Sets 7 and 8, it is not expected that alternatives would be chosen from both Alternative Sets 7 and 8 for one fishery. One could select an alternative for the longfin squid fishery from one set and for the mackerel fishery from another set, but not from both sets for one fishery. There are some hotspot areas north of Cape Cod that are not covered by Alternative Set 7's larger areas but there is relatively low mackerel and/or longfin squid activity in those areas at the relevant times of the year. Because of Alternative Set 8's small areas (hotspots) the difference in terms of impacts are not expected to be proportionally less for Set 8 compared to Set 7. Rather, Set 8 would be expected to have negligible impacts across resource types due to fishery participants' abilities to redistribute effort, which could not occur to the same degree with Set 7 given how large the areas are in Set 7.

7.9 Summary by VEC of preferred alternatives' impacts

Impacts by VEC have been summarized for each alternative set but not yet overall for the combined set of preferred alternatives. Before the impacts are summarized by VEC for the preferred alternatives, below follows a summary of all the preferred alternatives:

The preferred alternatives would: require weekly VTR reporting for all MSB vessel permits (1c); require a 48-hour pre directed mackerel trip notification (1d48); require VMS and daily VMS catch reporting for mackerel and longfin squid vessels (1eMack, 1eLong, 1fMack, and 1fLong); and require a 6-hour pre-landing notification via VMS for mackerel landings greater than 20,000 pounds (1gMack). The preferred alternatives would also require federal MSB dealers to weigh all landings of mackerel over 20,000 pounds (2d) and longfin squid over 2,500 pounds (2f) or document why they cannot weight landings (2g). (If all fish are not weighed separately, dealers would have to document with each transaction how they estimate the relative composition of mixed catches.). The preferred alternatives would also require for mackerel and longfin-butterfish permits that: reasonable assistance be provided to observers (3b); notice of haul-back or pumping be provided to observers (3c); one observer is provided for each vessel on pair-trawl operations whenever possible (3d). Unless safety, mechanical, or spiny dogfish issues make it inappropriate, the same vessels would not be able to release hauls of fish ("slippage") prior to observer documentation, and catch affidavits would have to be completed for any pre-observed net release (3j). For mackerel limited access vessels, there would also be a fleet-wide cap of 10 non-emergency (safety, mechanical, spiny dogfish) slippages after which further non-emergency slippages would require a vessel to terminate their trip (3l). The Council also made implementation of additional portside monitoring and catch avoidance based on portside monitoring frameworkable (4f). The Council recommended 100% observer coverage of mid-water trawl (MWT) mackerel trips (5b4) as well as tiered coverage levels for small mesh bottom trawl mackerel trips (100% for Tier 1, 50% for Tier 2, and 25% for Tier 3) (5c4) along with requiring mackerel vessels to pay $325 when they carry observers to help fund the desired coverage levels (5f). Coverage levels would be re-evaluated after 2 years (5h). Since RH/S catch is greatest in the mackerel fishery, and current analysis suggested that area-based could not be determined to be an effective measure, the Council recommended mortality caps for RH/S on the mackerel fishery (6b and 6c) and added future mortality caps and hotspot closures as frameworkable actions (6f and 8b respectively).

1. Managed Resources Impacts (mackerel, *Illex*, butterfish, longfin squid)

None of the preferred alternatives are likely to substantially impact the mackerel, *Illex*, butterfish, or longfin squid stocks. These fisheries are already managed with hard quotas and weekly dealer monitoring designed to ensure sustainability. In addition, a variety of mechanisms (closure thresholds, trip limits, closure projection exercises by NMFS), buffer against overages. The preferred reporting and monitoring alternatives (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5b4, 5c4, 5f, 5h) will result in improved reporting and monitoring which could marginally improve NMFS' ability to effectively close the MSB fisheries when needed, which increases sustainability and so would have small positive impacts for the managed resources. The improved reporting and monitoring could also lead to better discard estimation (of managed species) which could lead to improved management. The preferred alternatives that could directly limit effort in the mackerel fishery (6b, 6c), could lead to larger MSB stocks, but impacts should be minimal since management already strives for sustainability.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

2. Non-target Species Impacts (Including RH/S and species managed in other plans)

The preferred reporting and monitoring alternatives (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5b4, 5c4, 5f, 5h) will result in improved reporting and monitoring which should indirectly lead to positive benefits for non-target species because non-target interactions should be better documented and/or estimated, which in turn should assist effective management/minimization of non-target interactions. If industry has to pay for the observer coverage recommended in 5b4 and 5c4, overall mackerel effort could be reduced which would lead to benefits for non-target species. The preferred alternatives that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce negative impacts on non-target species, especially RH/S, though how much any reduced RH/S catches in the mackerel fishery affect overall RH/S abundance is unknown.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

3. Habitat Impacts Including EFH

The preferred reporting and monitoring alternatives (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5b4, 5c4, 5f, 5h) should have negligible impacts on habitat. If industry has to pay for the observer coverage recommended in 5b4 and 5c4, overall mackerel effort could be reduced which would lead to benefits for habitat (but probably negligible since most mackerel have been caught with mid-water gear recently). The preferred alternatives that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce negative impacts on habitat (but probably negligibly since most mackerel have been caught with mid-water gear recently).

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

4. Protected Resources

The preferred reporting and monitoring alternatives (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5b4, 5c4, 5f, 5h) will result in improved reporting and monitoring which should indirectly lead to positive benefits for protected resources because interactions should be better documented and/or estimated, which in turn should assist effective management/minimization of interactions. If industry has to pay for the observer coverage recommended in 5b4 and 5c4, overall mackerel effort could be reduced which would lead to benefits for protected resources. The preferred alternatives that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce interactions as well.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

5. Human Communities

The overall human community impacts are best described as mixed with unknown overall impacts. Most of the preferred reporting and monitoring alternatives should have negligible or minimal impacts on how the fisheries operate (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5h). Provisions for mandatory industry funding of observer coverage (5b4, 5c4, 5f) would substantially raise fishing costs, and measures that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce future fishing revenues as well, though the amount depends on what is set in specifications, which will be analyzed in specifications at a later date.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

To the extent that the preferred alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other species, then the preferred alternatives should result in long term additional benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). However, due to the uncertainty about how the productivity of RH/S is impacted by current catch levels in the MSB fisheries, it is difficult to quantity such benefits. The amount of benefit to RH/S stocks from any action affecting the MSB fisheries is unknown, so even though one might contemplate what the value of rebuilt RH/S fisheries might be, it is not possible to know if an action in this document might lead to rebuilt RH/S fisheries because of the range of issues likely affecting RH/S stocks.

8.0 Cumulative Effects Assessment

A cumulative effects assessment (CEA) is a required part of an EIS according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). 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 Amendment 14 together with past, present, and reasonably foreseeable future actions that affect the MSB environment. It may be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in comparison to the analysis of the effects of individual actions given in Section 7.0.

The assessment presented here is explicitly structured upon the CEQ's 11-step CEA process that is described in their 1997 report, "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ 1997). These eleven steps are itemized below:

The CEQ's eleven step CEA process. Taken from Table 1-5 in CEQ (1997).

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.

2. Establish the geographic scope for the analysis.

3. Establish the timeframe for the analysis.

4. Identify other actions affecting the resources, ecosystems, and human communities of concern.

5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

7. Define a baseline condition for the resources, ecosystems, and human communities.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.

9. Determine the magnitude and significance of cumulative effects.

10. Modify and add alternatives to avoid, minimize, or mitigate significant cumulative effects.

11. Monitor the cumulative effects of the selected alternative(s) and adapt management.

To a great extent, the descriptions and analyses presented in previous sections of this document have contributed to the completion of most of the CEQ's eleven steps, however; the purpose of this section of the document is to point out to the reader how these steps have been accomplished within the development of Amendment 14 and its accompanying environmental impact analyses.

8.1 Cumulative Effects from Proposed Action and Assessment Goals

In Section 6.0 (Description of the Affected Environment) the valued ecosystem components (VECs) that exist within the MSB fishery environment are identified and the basis for their selection is established. This is associated with the completion of Step 1 in the CEQ's 11-Step process. The VECs are listed below.

1. Managed Resources
   - Atlantic mackerel stock
   - *Illex* stock
   - *Longfin squid* stock
   - Atlantic butterfish stock
2. Non-target species

3. Habitat including EFH for the managed resources and non-target species
4. Endangered and other protected resources
5. Human Communities

8.2 Geographic Boundaries

The analysis of impacts focuses primarily on actions related to the harvest of the managed resources. Therefore, the geographic area used to define the core geographic scope for *managed resources, non-target species, habitat,* and *endangered and protected species* was the area within which the majority of harvest effort for the managed resources occurs (See Figure 22). For *human communities*, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest of the managed resources. These communities were found to occur in coastal states from Maine to North Carolina.

8.3 Temporal Boundaries

The temporal scope of past and present actions for *managed resources, non-target species, habitat and human communities* is primarily focused on actions that have occurred after FMP implementation (1979). For *endangered and other protected species*, the scope of past and present actions is on a species-by-species basis (Section 6.4) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs, which includes the measures proposed by this amendment, extends five years into the future following the expected implementation in 2014 (i.e., ~2019). This period was chosen because the dynamic nature of resource management and lack of information on projects that may occur in the future makes it difficult to predict impacts beyond this timeframe with any certainty.

8.4 Identify Other Action Affecting the Resources, Ecosystems, and Human Communities of Concern.

Table 75 accomplishes Step 4 of the CEQ process which calls for the identification of other actions that affect the VECs, i.e., actions *other* than those being developed in this document. These actions are presented in chronological order, and codes indicate whether an action relates to the past (**P**), present (**Pr**), or reasonably foreseeable future (**RFF**). When any of these abbreviations occur together, it indicates that some past actions are still relevant to the present and/or future. A brief explanation of the rationale for concluding what effect each action has (or will have) had on each of the VECs is provided in the table and is not repeated here.

Note that most of these *other* actions come from *fishery-related activities* (e.g., Federal fishery management actions). As expected, these activities have fairly straight-forward 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 MSA, as amended in 1996 and 2007. That legislation was enacted to promote long-term positive

impacts on the environment in the context of fisheries activities. More specifically the act 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 effective fishing effort (e.g., minimum mesh size for longfin squid in Amendment 5) may result in negative short-term socio-economic impacts for fishery participants (added cost of modifying gear). However, these impacts are usually necessary to bring about long-term sustainability of a given resource (in this case, increasing butterfish escapement, albeit marginally), 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 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 nearshore 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 lower the maximum sustainable yield of the managed resources, and negatively affect 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.

The overall impacts of these *other* (past, present, and reasonably foreseeable) actions are summarized in Table 75 and discussed below. These impacts, in addition to the impacts of the management actions being developed in this document (Section 7.0), comprise the total cumulative effects that will contribute to the significance determination for each of the VECs exhibited later in Table 76.

Table 75. Impacts of Past, Present and Reasonably Foreseeable Future Actions on the five VECs. These actions do not include those under consideration in this Amendment.

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
FISHERY-RELATED ACTIONS						
[P] Prosecution of the MSB fisheries by foreign fleets in the area that would become the U.S. EEZ (prior to implementation of the MSA)	Foreign fishing pressure peaked in the 1960s and slowly declined until passage of the MSA and implementation of the FMPs	**Direct High Negative** Foreign fishing depleted Atl. Mackerel stock below biomass threshold	**Potentially Direct High Negative** Limited information on discarding, but fishing effort was very high	**Potentially Direct High Negative** Limited information on discarding, but fishing effort was very high	**Potentially Direct High Negative** Limited information on protected resource encounters, but fishing effort was very high	**Potentially Indirect Negative** Revenue from fishing benefited foreign businesses
[P] Original FMPs (3) implemented (1978 and 1979)	Established management of the MSB fisheries	**Indirect Positive** Regulatory tool available to rebuild and manage stocks	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
[P, Pr] Original FMPs merged (1983)	Consolidated management of the MSB fisheries under one FMP	**No Impact** Administrative procedure	**No Impact** Administrative procedure	**No Impact** Administrative procedure	**No Impact** Administrative procedure	**No Impact** Administrative procedure
[P, Pr] Amendment 2 to the MSB FMP (1986)	Revised squid discard foreign fishing allowances	**Indirect Positive** Reduced squid mortality	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
[P] Amendment 3 to the MSB FMP (1991)	Established overfishing definitions for all four species	**Indirect Positive** Provided basis for sustainable management	**Indirect Low Positive** Reduced fishing effort	**Indirect Low Positive** Reduced fishing effort	**Indirect Low Positive** Reduced fishing effort	**Indirect Positive** Increased probability of long term sustainability
[P] Amendment 4 to the MSB FMP (1991)	Limited activity of directed foreign fishing and JV transfers to foreign vessels	**Indirect Low Positive** Reduced fishing effort	**Indirect Low Positive** Reduced fishing effort	**Indirect Low Positive** Reduced fishing effort	**Indirect Low Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses

Table 75 (continued)

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[P, Pr] Amendment 5 to the MSB FMP (1996)	Eliminated foreign fisheries for squids and butterfish	**Potentially Indirect Positive** Reduced effort	**Potentially Indirect Positive** Reduced effort	**Potentially Indirect Positive** Reduced effort	**Potentially Indirect Positive** Reduced effort	**Indirect Positive** Benefited domestic businesses
	Implemented limited access for squid/butterfish	**Indirect Positive** Constrained fishing effort	**Indirect Positive** Constrained fishing effort	**Indirect Positive** Constrained fishing effort	**Indirect Positive** Constrained fishing effort	**Indirect Positive** Reduced overcapacity
	Expanded mg. unit to all four species	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative
	Establish longfin squid minimum mesh size (included exemption for *Illex* fishery)	**Low Positive** Marginal increase in butterfish escapement	**Direct Positive** Increased finfish escapement	**Unknown** Changes in fishing effort unknown	**Unknown** Changes in fishing effort unknown	**Indirect Negative (short term)** Cost of modifying gear
[P, Pr] Amendment 8 to the MSB FMP (1998)	Brought FMP into compliance with new and revised National Standards	**Indirect Positive** Improved regulatory tool for ensuring sustainability	**Indirect Positive** Strengthened mandate to reduce discards	**Indirect Positive** Strengthened mandate to protect habitat	**Indirect Positive**	**Indirect Positive (long term)**
[P, Pr] Summer Flounder, Scup and Black Sea Bass Specifications (2000)	Established scup small mesh gear restricted areas	**Potentially Indirect Positive** Reduced fishing effort locally	**Potentially Indirect Positive** Reduced fishing effort locally	**Potentially Indirect Positive** Reduced fishing effort locally	**Potentially Indirect Positive** Reduced fishing effort locally	**Indirect Negative (short term)** Cost associated with shifting effort for some participants
[P, Pr] Framework 2 to the MSB FMP (2002)	Extended moratorium on entry into limited access *Illex* fishery	**Indirect Positive** Constrain harvest capacity	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Potentially Indirect Positive** Prevented increases in capacity
[P] Framework 3 to the MSB FMP (2003)	Extended by one year moratorium on entry into limited access *Illex* fishery	**Indirect Positive** Constrain harvest capacity	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Potentially Indirect Positive** Prevented increases in capacity
[P, Pr] Framework 4 to the MSB FMP (2004)	Extended by five years moratorium on entry into limited access *Illex* fishery	**Indirect Positive** Constrain harvest capacity	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Potentially Indirect Positive** Prevented increases in capacity

Table 75 (continued)

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[P, Pr] Amendment 9 to the MSB FMP (2008)	Multiple year specs	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative	**No Impact** Administrative
	Extend *Illex* moratorium	**Positive** Would decrease the likelihood that the fishing quota would be exceeded	**Positive** Constrains effort	**No Impact** If current trawling effort is maintained, would not increase habitat disturbances.	**Positive** Constrains effort	**Potentially Positive** Maintains net benefits to fleet and dependent communities by limiting overcapitalization.
	Revise biological reference points for longfin squid	**Potentially Positive** Increase chance of achieving long term sustainable yield for longfin squid.	**Potential low negative** May increase effort slightly if it results in a higher quota.	**Potential low negative** May increase effort slightly if it results in a higher quota.	**Potential low negative** May increase effort slightly if it results in a higher quota.	**Potential low positive** May increase benefits slightly if it results in a higher quota.
	Designate EFH for longfin squid eggs based on documented observations of egg mops	**Potentially positive** if used as basis for future management.	**Potentially positive** if used as basis for future management.	**Potentially positive** if used as basis for future management.	**Potentially positive** if used as basis for future management.	**Potentially positive long term** if used as basis for future management to improve long-term sustainability of resource.
	Area closures to reduce gear impacts on EFH	**Low positive** Small area with low effort impacted	**Low positive** Small area with low effort impacted	**Low positive** Protects deep-sea corals in small area.	**Low positive** Small area with low effort impacted	**No impact** Small area with low effort impacted
[RFFA] Amendment 5 to Atlantic Herring FMP – See Appendix 4	Addresses reporting, monitoring, and RH catch in the Atl. herring fishery	**Indirect Positive** May improve data quality for monitoring total removals	**Positive** May increase information about RH/S catch and/or reduce that catch	**Probably Minimal**	**Probably Minimal**	**Negative if effort is restricted. Potentially positive long term** if used to improve long-term sustainability of resources.

Table 75 (continued)

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[Pr]Amendment 10 to the MSB FMP (2010-2011)	Rebuild Butterfish with butterfish mortality cap.	**Positive** Stock Rebuilding	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Variable** Significant losses possible if longfin squid fishery cannot avoid butterfish.
	Reduce discards to the extent practicable.	**Positive** Majority of butterfish caught are discarded.	**Low Positive** Minor mesh increase included.	**Likely neutral.**	**Likely neutral.**	**Potentially negative if efficiency decreases.**
[Pr] Atlantic Trawl Gear Take Reduction Team	Recommend measures to reduce mortality and injury to the common dolphin and long fin pilot whale	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce discards	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues
[P] Standardized Bycatch Reporting Methodology (2008)	Recommend measures to monitor discards at an acceptable level of precision and accuracy	**Indirect Positive** Will improve data quality for monitoring total removals of managed resources	**Indirect Positive** Will improve data quality for monitoring removals of non-target species	**Neutral** Will not affect distribution of effort	**Indirect Positive** Will increase and/or optimize observer coverage	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
[P,Pr] Omnibus ACL/AM Amendment (2011)	Implemented ACLs/AMs in all FMPs as necessary	**Neutral to Positive** Managed species already managed with quotas	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Indirect Positive** Constrain fishing effort	**Positive** Sustainability of resources maintained.
[P,Pr,] Amendment 11 to the MSB FMP (2010-2011)	Updated EFH, established Rec-Com allocation, will implement mackerel limited access	**Positive –** limited access should limit race to fish	**Indirect Positive** Constrain fishing effort	**Potentially positive** if used as basis for future management.	**Indirect Positive** Constrain fishing effort	**Positive** Sustainability of resources maintained.
[RFFA] Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries	May recommend strategies to prevent the catch of sea turtles in commercial fisheries operations	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce discards	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

Table 75 (continued)

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[Pr] Standardized Bycatch Reporting Methodology Revision	Recommend measures to monitor discards at an acceptable level of precision and accuracy	**Indirect Positive** Will improve data quality for monitoring total removals of managed resources	**Indirect Positive** Will improve data quality for monitoring removals of non-target species	**Neutral** Will not affect distribution of effort	**Indirect Positive** Will increase and/or optimize observer coverage	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
[Pr,] Amendment 15 to the MSB FMP	Considering adding RH/S as Council-managed species	**Neutral**	**Positive** Would increase RH/S conservation efforts	**Potentially positive** MSB effort may be reduced	**Potentially positive** MSB effort may be reduced	**Uncertain overall**
[Pr,] Amendment 16 to the MSB FMP	Considering adding deep-sea coral protections	**Neutral**	**Positive** Could decrease impacts on deep-sea corals from MSB fishing	**Potentially positive** MSB effort may be reduced	**Potentially positive** MSB effort may be reduced	**Uncertain overall**
[Pr,] Amendment 17 to the MSB FMP	Considering modifications to recreational accountability measures	**Neutral - Overall MSB effort unlikely to be impacted.**	**Neutral - Overall MSB effort unlikely to be impacted.**	**Neutral - Overall MSB effort unlikely to be impacted.**ement.	**Neutral - Overall MSB effort unlikely to be impacted.**	**Neutral**
Non-Fishery Related Actions Follow on Next Page						

Table 75 (continued)

NON –FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr, RFFA Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Positive** Beachgoers generally like sand
P, Pr, RFFA Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for some interests, potential displacement for others

Table 75 (continued)

Action	Description	Impacts on Managed Resources	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFFA Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Reduced habitat quality in the immediate project area	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects
RFFA Liquefied Natural Gas terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several Liquefied Natural Gas terminals are proposed, including MA, RI, NY, NJ and DE)	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects
RFFA Offshore Wind Energy Facilities (medium probability w/in 5 years)	Construction of wind turbines to harness electrical power (Several facilities proposed from ME through NC, including off the coast of MA, NY/NJ and VA)	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects

Summary of Non-Fishing Effects Though largely unquantifiable, it is likely that the non-fishing activities noted above would have negative impacts on habitat quality from disturbance and construction activities in the area immediately around the affected area. This would be a direct impact on habitat and an indirect effect to planktonic, juvenile, and adult life stages of fish and protected species in the project areas due to habitat degradation. Given the wide distribution of the affected species, minor overall negative effects to habitat are anticipated since the affected areas are localized to the project sites, which involve a small percentage of the fish populations and their habitat.

Summary Effects of Past and Present Actions The present conditions of the VECs are empirical indicators of the summary effects of past actions since, independent of natural processes, and these present conditions are largely the product of these past actions. The combined effects of these actions are described in the VEC-by-VEC discussion below and are summarized in Table 76.

Managed species: The status of mackerel, butterfish, *Illex*, and longfin squid are unknown as of November 2011. Longfin squid biomass in 2009 was established to be above an accepted target but given the short lifespan of longfin squid it's true status, like that of the other MSB stocks, is unknown. While the negative effects of past and present actions associated with non-fishing activities (**Table 75**) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large.

Non-target species: The summary effects of past and present actions are less clear than for the managed resources. This is because the information needed to quantitatively measure the impacts on these species of MSB fishery activities and non-fishing activities is generally lacking. The implementation of a revised omnibus SBRM Amendment is expected to provide more data to allow management to better manage discards.

This Amendment: The preferred reporting and monitoring alternatives (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5b4, 5c4, 5f, 5h) will result in improved reporting and monitoring which should indirectly lead to positive benefits for non-target species because non-target interactions should be better documented and/or estimated, which in turn should assist effective management/minimization of non-target interactions. If industry has to pay for the observer coverage recommended in 5b4 and 5c4, overall mackerel effort could be reduced which would lead to benefits for non-target species. The preferred alternatives that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce negative impacts on non-target species, especially RH/S, though how much any reduced RH/S catches in the mackerel fishery affect overall RH/S abundance is unknown. Actual cap amounts will be considered and analyzed via the specifications process.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

The summary effects of past and present actions on non-target species are considered to be a mixed set of partially offsetting positive effects through fishery effort reduction and negative effects through discard mortality and non-fishing activities. The prosecution of fishing activities in general will

necessarily reduce the abundance of various non-target species. As such, effort reduction or gear modifications will, in effect, reduce the magnitude of the negative impact of fishing in general. Again, although the negative effects of past and present actions associated with non-fishing activities (**Table 75**) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large for most species, although impacts could be large for anadromous species such as RH/S. Altogether, the resultant impact of past and present actions on non-target species is a likely net negative sum effect. Again this would likely improve with future actions to reduce discards.

Habitat and Protected Species: For the habitat and protected resource VECs, the summary effects of past and present actions are also considered to be negative. This follows the same logic presented under the discussion of impacts on non-target species: effort reduction or gear modifications will, in effect, reduce the magnitude of the negative impact on these VECs that results from fishing activities. Again, although the negative effects of past and present actions associated with non-fishing activities (**Table 75**) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large for most species, although impacts could be large for anadromous species such as RH/S or sturgeon. Thus, the resultant impact of past and present actions on non-target species is a net negative sum effect on these VECs.

As discussed in section 6.5.5, estimated encounters with Atlantic sturgeon and small-mesh otter trawl gear in the 600 series of statistical areas average 759 sturgeon annually. Of these small-mesh otter trawl encounters, less than 5 percent are expected to result in serious injury or mortality. For reference, estimated total annual takes for all gear types (otter trawl and sink gillnet) from 2006-2010 ranged from 1536 to 3221 (average 2,215); estimated annual mortalities for all gear types ranged from 37 to 376 sturgeon. Overall, the contribution of small-mesh otter trawl gear to sturgeon mortalities is low compared to the contribution of gillnet gear to sturgeon mortalities.

DPS-specific population levels for Atlantic sturgeon are difficult to quantify at this time, and further work needs to be done to develop accurate population estimates for each DPS. Current estimates indicate that the Hudson River DPS likely consists of approximately 870 spawning individuals in any one year. However, adult Atlantic sturgeon are not believed to spawn annually, but rather every other year for males and every two to five years for females. Although NMFS does not have information necessary to determine the sex or spawning condition of Atlantic sturgeon encountered by the MSB fisheries, these encounters may include both males and females and fish that may or may not spawn during that year. Therefore, encounters of Atlantic sturgeon by the MSB fisheries may be a subset of the entire population, as opposed to being comprised exclusively of the smaller annual spawning population.

Despite limited information that can be used to accurately estimate the number of Atlantic sturgeon in each DPS and because estimated encounters and expected mortalities are lower in recent years than has been estimated in the past, it is unlikely that the implementation of Amendment 14 would result in significant impacts under NEPA to any DPS of Atlantic sturgeon and the proposed improved monitoring could assist effective management of sturgeon. The proposed RH/S mortality caps could also reduce mackerel fishing effort. As such, the proposed action is expected to have little to no impact on total fishing effort associated with small-mesh otter trawl gear as it might impact sturgeon.

Therefore, the preferred alternatives in Amendment 14 are not likely to result in a significant impact under NEPA on Atlantic sturgeon.

Human communities:

This Amendment: The overall human community impacts are best described as mixed with unknown overall impacts. Most of the preferred reporting and monitoring alternatives should have negligible or minimal impacts on how the fisheries operate (1c, 1d48, 1eMack, 1eLong, 1fMack, 1fLong, 1gMack, 2d, 2f, 2g, 3b, 3c, 3d, 3j, 3l, 4f, 5h). Provisions for mandatory industry funding of observer coverage (5b4, 5c4, 5f) would substantially raise fishing costs, and measures that could directly limit effort in the mackerel fishery once a certain amount of RH/S is caught (6b, 6c), could reduce future fishing revenues as well, though the amount depends on what is set in specifications, which will be analyzed in specifications at a later date.

Allowing mortality caps and area-based closures to be frameworkable actions (6f, 8b) should not have any impacts other than allowing more rapid management responses. Impacts would be analyzed at the time of framework consideration and no immediate impacts would be expected for any VEC. Any potential follow-up actions would be subsequently analyzed and considered separately.

To the extent that the preferred alternatives lead to better management (i.e. sustainable fisheries producing optimal yields) of RH/S or other species, then the preferred alternatives should result in long term additional benefits related to future commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). However, due to the uncertainty about how the productivity of RH/S is impacted by current catch levels in the MSB fisheries, it is difficult to quantity such benefits. The amount of benefit to RH/S stocks from any action affecting the MSB fisheries is unknown, so even though one might contemplate what the value of rebuilt RH/S fisheries might be, it is not possible to know if an action in this document might lead to rebuilt RH/S fisheries because of the range of issues likely affecting RH/S stocks.

The summary effect of past and present actions is complex since the effects have varied among fishery participants, consumers, and communities. Nevertheless, the net effect is considered to be positive in that the fisheries managed under the MSB FMP currently support viable domestic fisheries. While some short-term economic costs have been associated with effort reductions and gear modifications (see **Table 75**), economic returns have generally been positive and as such, have tended to make a positive contribution to the communities associated with harvest of these species.

Summary Effects of Future Actions As with past and present actions, the list of reasonably foreseeable future actions is provided in **Table 75**. Additionally, the same general trends will be noted with regard to the expected outcomes of fishery-related actions and non-fishing actions; the summary effects of fishery related actions tend to be positive with respect to natural resources although short-term negative or mixed effects are expected for human communities. Conversely, for the non-fishing actions listed in **Table 75**, the general outcome remains negative, but minor for all VECs, again due to the difference in scale of exposure of the habitat perturbation and the population except for

anadromous species which may be more impacted by non-fishing activities that compromise habitat and water quality.

The directionality of the impacts of future actions on the VECs will necessarily be a function of the offsetting negative vs. positive impacts of each of the actions. Since the magnitude and significance of the impacts of these future actions, especially non-fishing impacts, is poorly understood, conclusions as to the summary effects will essentially consist of an educated guess.

Recall that the future temporal boundary for this CEA is five years after implementation of the amendment (~2019; Section 8.3). Within that timeframe, the summary effects of future actions on managed resources, non-target species, habitat, and protected resources are all expected to be positive, notwithstanding the localized nearshore negative effects of non-fishing actions. The optimization of the conditions of the resources is the primary objective of the management of these natural resources. Additionally, it is unknown, but expected that technology to allow for mitigation of the negative impacts of non-fishing activities will improve.

For human communities, short-term (i.e., within the temporal scope of this CEA) costs may occur. This negative impact is expected to be the byproduct of an adjustment to the improved management of the natural resources. In the longer term, positive impacts on human communities should come about as sustainability of natural resources is attained.

Table 76. Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Amendment 14 (based on actions listed in Table 75).

VEC	Past Actions (P)	Present Actions (Pr)	Reasonably Foreseeable Future Actions (RFFA)	Combined Effects of Past, Present, Future Actions
Managed Resources	Uncertain since status of all species is currently unknown but likely positive given continued fisheries.	Uncertain since status of all species is currently unknown but likely positive given continued fisheries.	Uncertain since status of all species is currently unknown but likely positive given continued fisheries.	Uncertain since status of all species is currently unknown but likely positive given continued fisheries.
Non-Target Species	**negative** combined effects of discard mortality and non-fishing actions that reduce habitat quality	**negative or somewhat less negative than past** combined effects of reduced discard mortality and non-fishing actions that reduce habitat quality	**positive** reductions in discard incidence, improved discards estimation,	**Negative in short term** discards will continue until reduction measures are implemented **Long term positive** Amendment 10, 14 measures would benefit other species, improved discards accounting, improved habitat quality
Habitat	**negative** combined effects of disturbance by fishing gear and non-fishing actions have reduced habitat quality	**negative or somewhat less negative than past** continued combined effects of disturbance by fishing gear and non-fishing actions have reduced habitat quality	**positive** reduction in effects of disturbance by fishing gear are expected	**positive** reduced habitat disturbance by fishing gear
Protected Resources	**negative** combined effects of gear encounters and non-fishing actions that reduce habitat quality	**Negative or somewhat less negative than past** combined effects of gear encounters and non-fishing actions that reduce habitat quality	**positive** reduced gear encounters through effort reduction, and Sea Turtle Strategy; improved habitat quality is expected	**Negative short term** until trawl take reduction research plan is implemented; **Positive long term** reduced encounters through effort reduction and Trawl take reduction research plan /Sea Turtle Strategy; improved habitat quality is expected

Human Communities	**positive** fisheries have supported profitable industries and viable fishing communities	**positive** fisheries continue to support profitable industries and viable fishing communities	**short-term negative** some revenue loss may occur if management results reduction of revenue per unit of effort	**short-term negative** Uncertain since status of all species is currently unknown **long-term positive** sustainable resources should support viable communities and economies

8.5 RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES IDENTIFIED IN SCOPING IN TERMS OF THEIR RESPONSE TO CHANGE AND CAPACITY TO WITHSTAND STRESSES

See 8.6, below.

8.6 STRESSES AFFECTING THE RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES AND THEIR RELATION TO REGULATORY THRESHOLDS

CEQ Steps 5 and 6 were accomplished either explicitly or implicitly in this document for each VEC in Section 6.0. It is suggested that the reader refer to the appropriate subsections to obtain details regarding this information.

In terms of stresses affecting fishing businesses, the Council has been conducting a visioning exercise and receiving much input from stakeholders. For MSB participants, 3 common themes were 1) The price of fuel has made profitable fishing difficult and 2) a sequential limiting of fishermen's ability to switch from a less abundant to a more abundant species has bade profitable fishing difficult and exacerbated stock size swings, and 3) It is not so much any one regulation that puts fishermen out of business so much as the every growing compendium of regulations.

Table 77. Summary of information related to CEQ steps 5 and 6 that were addressed in Section 6.0.

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VEC	CEQ Step 5 (Response to change and ability to withstand stress – i.e., significance criteria)	CEQ Step 6 (Stresses affecting the resources)
Managed Resource	• Biomass drops below threshold (e.g., ½ of the biomass associated with MSY) • Fishing mortality exceeds threshold (these thresholds are defined for each managed resource in Section 6.1)	• Directed harvest • Discarding • Non-fishing activities
Non-target species	• Largely unquantifiable, but implementation of development of omnibus SBRM FMP should improve.	• Encounters with fishing gear • Non-fishing activities
Habitat	See EFH overlap analysis of Amendment 9, Section 6.3.4.1	• Encounters with fishing gear • Non-fishing activities
Protected Resources	• Marine mammals - mortalities exceed potential biological removal which is defined for each species in Section 6.4. • Sea Turtles – nest counts, or estimated number of nesting females below target levels	• Encounters with fishing gear • Non-fishing activities
Human Communities	In general, the significance of impacts is measured by the potential for revenue loss. The standards established under E.O. 12866 or the Regulatory Flexibility Act may be candidates.	• Short term: revenue losses from changes in current fishing practices (e.g., gear modifications, area closures). • Short term and long term: revenue losses from resource depletion

For the purposes of providing a conceptual context for this discussion of the affect the human environment, some general categories of the environmental influences on the VECs are provided in **Figure 70**. Most of the time, influences of actions on the population size of a managed resource can, by and large, be extended to populations of non-target species or protected species, and vice versa, especially with regard to increases and decreases in fishing effort. The effects of actions on habitat quality can come from a wide variety of fishing and non-fishing activities. In turn, habitat quality factors into the condition of the managed resource, non-target species, and protected resource VECs.

The condition of the human communities VEC is generally associated with increases and decreases in revenue from fishing operations. Operating costs tend to increase when availability of the managed resource decreases either through scarcity or through regulatory restrictions on harvest. The availability of the managed resource also affects competition among fishing entities for resources and consumer demand. These factors influence product price which feeds back to the economic and social well-being of the human communities.

Optimizing the future condition of a given VEC can have offsetting impacts on other VECs. For example, if updating EFH designations led to future gear restricted areas, closing areas to bottom otter trawling would directly improve habitat quality, and be expected to indirectly improve the conditions of managed resources, non-target species, and protected resources. This action, however, would negatively impact human communities dependent on revenue from otter trawling in that area, at least in the short term. Additionally, the indirect benefits to managed resources, non-target species, and protected resources may be localized, and increased bottom trawl effort in other areas may offset these benefits to some degree.

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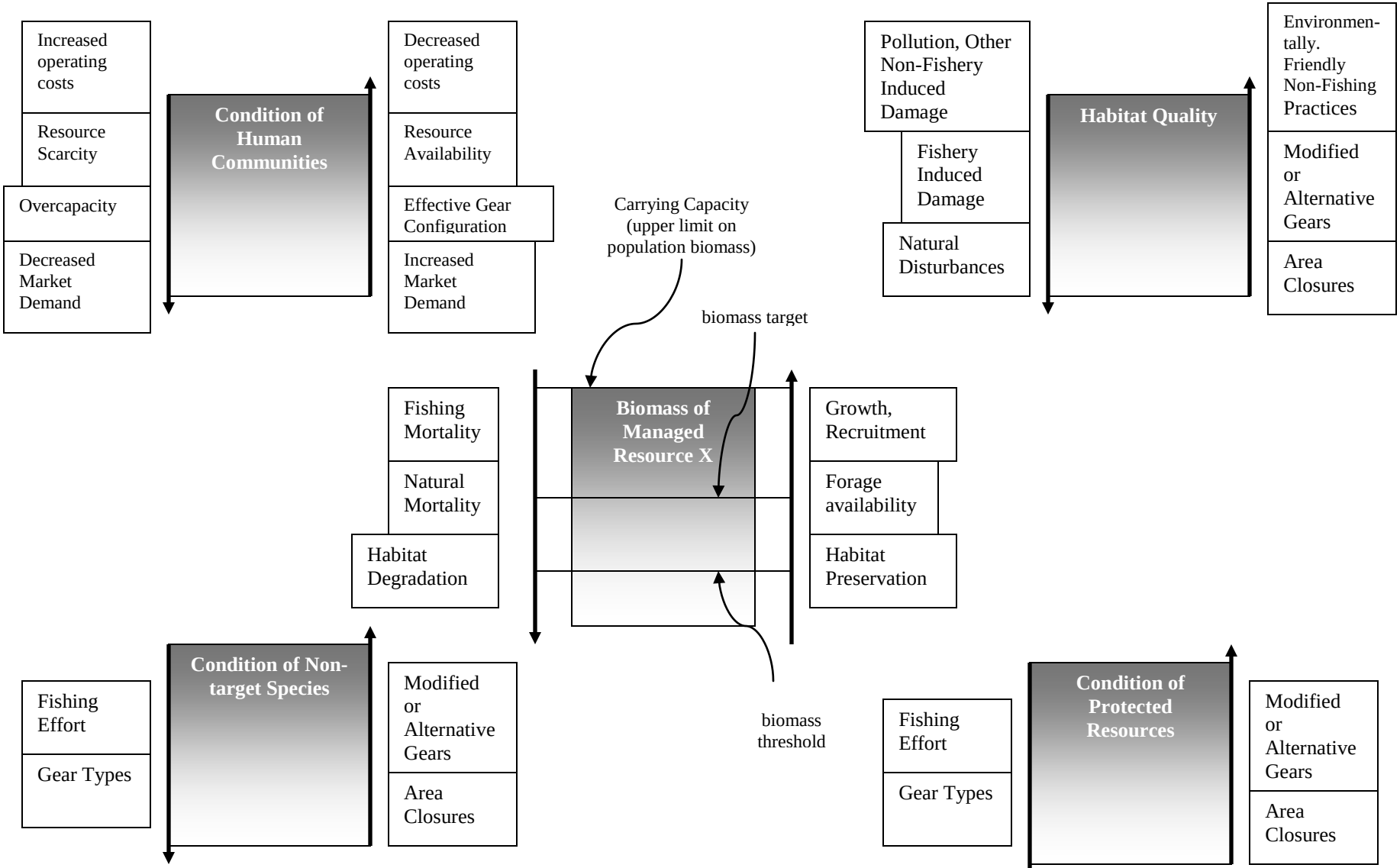

Figure 70. Examples of environmental sources of positive impacts (up arrows) and negative impacts (down arrows) for the five VECs.

8.7 BASELINE CONDITION FOR THE RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES

The CEQ's step 7 calls for a characterization of the baseline conditions for the VECs. For the purposes of this CEA, the baseline condition is considered as the present condition of the VECs plus the combined effects of the past, present and reasonably foreseeable future actions. **Table 78** summarizes the added effects of the condition of the VECs (i.e., status/trends/stresses from Section 6 and **Table 77**) and the sum effect of the past, present and reasonably foreseeable future actions (from Table 78). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, only qualitative metrics are available for the VECs. For managed species, the baseline condition is uncertain since the status of all managed species is currently unknown but it is likely positive given the continued fisheries that target and catch the managed species. For non-target species, the constraints of data quality preclude a quantitative baseline. The conditions of the habitat and human communities VECS are complex and varied. As such, the reader should refer to the characterizations given in Sections 6.3 and 6.5, respectively. For protected resources the baseline is negative in the short run given continued interaction but should be positive in the long run as additional mitigations are implemented. As mentioned above, this CEA Baseline is then used to assess cumulative effects of the proposed management actions.

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Table 78. CEA baseline conditions of the VECs.

VEC		Status/Trends/Stresses	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 76)	Combined CEA Baseline Conditions
Managed Resource	**Atl. Mackerel**	Unknown; landings variable	Uncertain since status of all species is currently unknown but likely positive given continued fisheries.	Uncertain since the status of all species is currently unknown but likely positive given continued fisheries exist.
	Illex	Unknown; landings variable		
	longfin squid	Unknown; landings variable		
	Butterfish	Unknown; landings constrained by regulations		
Non-target Species (principle species listed in section 6. 2)		Quantitative characterization of discards in MSB fisheries is poor to unknown; longfin squid fishery continues to account for large proportion of discards observed in NEFOP for several species including butterfish	**Negative in short term** discards will continue until reduction measures are implemented; **Long term positive** Amendment 10 measures would benefit other species, improved discards accounting, improved habitat quality	**Negative in short term** Increased discard rates will continue until reduction measures are implemented **Positive in long term** continued discards minimization should improve discards accounting and/or reduce discards
Habitat		Complex and variable - See Section 6.3.4.1of Amendment 9; Non-fishing activities had historically negative but site-specific effects on habitat quality; Mouth of Hudson Canyon/Tilefish Habitat Area of Particular Concern among the areas most ecologically sensitive	**Positive** reduced habitat disturbance by fishing gear	**Positive** - reduced habitat disturbance by fishing gear and non-fishing actions

Protected Resources	Common dolphin White-sided dolphin	Unknown status, but takes are below Potential Biological Removal; taken by longfin squid, mackerel and other fisheries; Unknown status, but takes are below Potential Biological Removal; historically taken by foreign mackerel vessels;	**Negative or somewhat less negative than past in short term** until Trawl take reduction research plan is implemented, improved habitat quality **Long term positive** reduced gear encounters through effort reduction and Trawl take reduction research plan /Sea Turtle Strategy; improved habitat quality are expected	**Negative or low negative in short term** -- Until Trawl take reduction research plan is implemented **Positive** – reduced gear encounters through effort reduction and Trawl take reduction research plan, Sea Turtle Strategy; improved habitat quality
	Pilot whales	Unknown status, but takes are below Potential Biological Removal; taken by *Illex* and longfin squid		
	Leatherback sea turtle	ESA classification: Endangered, number of nesting females below sustainable level; taken by longfin squid trawl		
	Loggerhead sea turtle	ESA classification: Threatened, nest counts (~6,200 in 1998) below goal (12,800); taken by *Illex* and longfin squid trawl		
Human Communities		Complex and variable - See Section 6.5	**Positive -** Long-term sustainable resources should support viable communities and economies	**Short-term is uncertain given uncertainty about stock status.** **Long-term positive** as sustainable resources should support viable communities and economies

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The following sections elaborate on each CEA Baseline:

Managed Resource Impacts CEA Baseline: Since the current status of the managed resources is unknown, the CEA Baseline is uncertain but probably positive given the stocks continue to support fisheries although landings can be highly variable. **Bottom Line: Uncertain but probably positive.**

Non-target Species Impacts CEA Baseline: Fishery encounters with non-target species (6.2), and the subsequent discards mortality remains a substantial fishery management problem. At present, the nature and extent of non-target species discarding by the MSB fisheries, as well as many others operating in the U.S. Atlantic remains difficult to characterize. Given impending catch reduction management measures, the CEA baseline is negative in the short run as high catch rates and discards (especially in the longfin squid fishery) are likely still occurring but positive in the long run as management measures are implemented to reduce non-target catch. As mentioned above, non-fishing effects, although potentially negative to all fish species, are likely not exerting much negative effects on non-target species, due to the small scale of the habitat perturbation relative to the populations at large. **Bottom Line: Still negative in short run but expected positive in long run.**

Habitat Impacts CEA Baseline: For habitat, the summary effects of past and present actions assessed above in Section 8.4 were considered to be positive. Effort reductions and/or gear modifications have reduced the negative impacts on this VEC that results from fishing activities. Again, although the negative effects of past and present actions associated with non-fishing activities (**Table 75**) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large. Considering fishing effort over the next 5 years will likely be reduced, a resultant positive impact on habitat of "other" actions is anticipated. **Bottom Line: Positive due to reduced effort and resulting reduction in habitat impacts.**

Protected Resource Impacts CEA Baseline: For the protected species affected by this Amendment (listed in Section 6.4), the summary effects of the "other" past and present actions assessed above were considered to be negative in the short term but positive in the long term due to future effort reduction or gear modifications (gear modifications lessen the negative impact of a given level of effort). Future actions that would directly reduce the mortality of protected resources from encounters with MSB fisheries include the implementation of the Atlantic Trawl Gear Take Reduction Plan and the Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries. These actions and the current protection under MMPA and ESA are expected to result in positive cumulative impacts for these protected resources. **Bottom Line: Negative in short term but positive due to effort reduction and other efforts to reduce gear interactions.**

Human Communities Impacts CEA Baseline: The net effect of past and present "other" actions is considered to be positive in that the fisheries managed under the MSB FMP currently support viable domestic and international market demand. While some short-term economic costs have been associated with effort reductions and gear modifications (see **Table 75**), economic returns have generally been positive and as such, have tended to make a positive contribution to the communities associated with harvest of these species. In the short-term future (i.e., within the temporal scope of this CEA), costs may occur. This negative impact is expected to be the byproduct of an adjustment to the improved management of the natural resources. In the longer term, positive impacts on human communities should come about as sustainability of natural resources is attained. **Bottom Line: Uncertain but probably positive in short run and should be positive in the long run.**

8.8 CAUSE-AND-EFFECT RELATIONSHIPS BETWEEN HUMAN ACTIVITIES AND RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES

CEQ's step 8 has been accomplished through the analyses of impacts presented in Section 7.0, as well as the summary of past, present, and reasonably foreseeable future actions presented in **Table 75**, and the relationships between the VECs illustrated in **Figure 70** and its accompanying text.

8.9 MAGNITUDE AND SIGNIFICANCE OF CUMULATIVE EFFECTS

According to CEQ guidance, determining the magnitude of the cumulative effects consists of determining the separate effects of past actions, present actions, the proposed action (and reasonable alternatives), and other future actions. Once that is done, cumulative effects can be described. The significance of the effects is related to the magnitude, but also takes into account context and distribution. **Table 75** in Section 8.4 lists the effects of individual past, present, and future actions and is organized in chronological order so that review of that table will assist the reader in understanding the conclusions presented below regarding the summary effects of these separate actions. Note that fishery-related activities consist almost entirely of positive effects (with the exception of some short term negative effects on human communities) while non-fishing activities are generally associated with negative effects. 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 basis for this general outcome is explained in the text provided in Section 8.4. **Table 78** and associated text describes the summary effects of the past, present and future actions on the VECs.

Summary Incremental Impacts of the Proposed Actions

The impacts of the proposed actions are described in Section 7 and summarized in the executive summary (see also table 8). Since the impact of every alternative on every VEC is described in those sections, they are not repeated here. The incremental impacts of the preferred alternatives is summarized in Section 7.9.

Summary Cumulative Effects of the Proposed Actions

It is expected that the overall long-term cumulative effects should be positive for all VECs. This is because, barring some unexpected natural or human-induced catastrophe, 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. This document functions to identify the likely outcomes of various management alternatives. Identification of alternatives that would compromise resource sustainability should make implementation of those alternatives unlikely. With this in mind, the

expected likely cumulative impacts for the VECs are described below. As described above, the preferred alternatives are focused on better monitoring of directed and non-tageted catch, as well as control of catch of river herrings and shads.

Cumulative Managed Resources

The CEA baseline for managed resources is uncertain but probably positive (Table 78). Information about these stocks is likely to remain highly uncertain given their difficult-to-assess life history and the limited resources of NMFS to assess their stock status in near real time. However, the provisions recommended in this amendment should maintain or improve upon the baseline by improving monitoring and reducing effort. The past and present impacts, combined with the preferred alternatives and future actions are expected to continue rebuilding as necessary and strive to maintain sustainable stocks, should continue to yield positive impacts to the managed resources in the long term.

Cumulative Non-target Species Impacts:

The CEA baseline for non-target species resources is negative in the short run but expected to be positive in the long run (Table 78). The provisions recommended in this amendment, by improving monitoring and reducing effort, should contribute to positive effects on this VEC's cumulative impacts in the future. However, there are still other non-target species interactions to potentially address so cumulative impacts will still probably be negative in the short term. The past and present impacts, combined with the preferred alternatives and future actions which are expected to continue attempts to minimize impacts to non-target species, should continue to eliminate negative impacts to non-target species and produce a neutral to low positive cumulative impact in the future.

Cumulative Habitat Impacts:

The CEA baseline for habitat is positive (Table 78). Nothing in the amendment is expected to increase effort (and therefore habitat impacts), so cumulative impacts for habitat would be expected to continue to be positive. The past and present impacts, combined with the preferred alternatives and future actions should continue to have a positive cumulative impact on habitat.

Cumulative Protected Resource Impacts:

The CEA baseline for protected resources is negative in the short term but positive due to effort reduction and other efforts to reduce gear interactions (Table 78). While some effort reduction could occur as a result of the alternatives in this document, since the alternatives are not designed specifically to reduce protected species impacts, cumulative protected resource impacts are likely the same as the baseline, negative in the short run but positive in the long run. The past and present impacts, combined with the preferred alternatives will continue to produce a low negative impact until further reduced gear encounters are realized.

Cumulative Human Communities Impacts:

The CEA baseline for human communities is probably positive in short run and should be positive in the long run (Table78). The monitoring, at-sea observing, and discards reduction alternatives preferred in this document should reinforce effective conservation of the managed and non-target species leading to improved management of these natural resources which would continue to support positive long term cumulative impacts and continue to support viable domestic fisheries and revenues related to these fisheries. The past and present impacts, combined with the preferred alternatives and future actions should produce a positive cumulative impact to human communities in the future

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9.0 CONSISTENCY WITH THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

9.1 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 14 were developed by the Council to achieve the goals and objectives of the MSB fishery management plan, the primary goal of which is to manage the fishery at long-term sustainable levels by enhancing the probability of successful recruitment to the fishery. Consistent with the MSA requirements for ACLs and AMs , the mackerel and butterfish fisheries are managed through an overall ACL (that accounts for scientific and management uncertainties) and squid specifications are set based on the recommendations from the Council's SSC (squid, being sub-annual stocks are not subject to ACL/AM requirements). While much uncertainty exists regarding the productivity of the MSB stocks, the Council's risk policy and ABC control rules are designed to obtain optimum yield in the long run. None of the measures proposed in this amendment are expected to affect this determination. Amendment 14 was developed primarily to enhance catch monitoring for the mackerel and longfin squid fisheries. As discussed throughout the analysis in this document, improving catch monitoring may lead to better data for the MSB fisheries. The measures proposed should therefore advance the goals and objectives of the FMP and improve the Council's ability to manage the resource 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 this Amendment include, but are not limited to: permit data, landings data from vessel trip reports, information from resource trawl surveys, sea sampling (observer) data, data from the dealer weighout purchase reports, peer-reviewed assessments and original literature, and descriptive information provided by fishery participants and the public. To the best of the Council's knowledge these data sources constitute the best scientific information available. All analyses based on these data have been reviewed at multiple steps by NMFS and the public.

(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 MSB FMP addresses management of the MSB stocks throughout the range of the species in U.S. waters, in accordance with the jurisdiction of U.S. law. The development of Amendment 14 was also closely coordinated with the New England Fishery Management Council and the ASMFC, due to the overlap and interaction between the Atlantic herring and mackerel fisheries, as well as interactions with RH/S, which are managed by the ASMFC.

(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.

The community level impacts of the MSB fisheries are described in Section 6 of this document and human community impacts of the proposed measures are described in Section 7. The measures in Amendment 14 are intended to be applied regardless of location, and fishing for MSB species often takes place far from a vessel's homeport. While the measures do not discriminate between permit holders from different States, they may result in variable impacts across permit holders/fishery participants given the variability of the MSB resources. The proposed management measures are not expected to otherwise discriminate between residents of different States. This action does not allocate or assign fishing privileges among various fishermen.

(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.

This amendment focuses on improving catch monitoring and controlling RH/S catch in the MSB fisheries. While these goals may impose certain costs on fishery participants (see Section 7), the proposed measures should enhance efficient long-term management of fishery resources. No measures are proposed regarding economic allocation.

(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). Recent stock assessments have suggested that the MSB stocks are all likely particularly sensitive to environmental variables. In order to provide the greatest flexibility possible for future management decisions, the 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 (mortality caps and hotspot area restrictions to address non-target catches).

(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 stated purposes (which are consistent with the MSA), 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 New England Fishery Management Council, the Atlantic States Marine Fisheries Commission (ASMFC), U.S. F & W Service, and other interested entities and agencies to minimize duplicity. Public comments regarding the costs of potential measures were also carefully considered prior to taking action.

(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.

The community level impacts of the MSB fisheries are described in Section 6 of this document and human community impacts of the proposed measures are described in Section 7. Any costs incurred by fishery participants as a result of the measures proposed in this amendment are considered to be necessary in order to achieve the stated purposes (which are consistent with the MSA), and are viewed to be outweighed by the benefits of taking the management action. Overall, the proposed action is not expected to jeopardize the sustained participation of fishing communities that have depended on the MSB resources. The Council carefully considered the importance of the MSB resources to affected fishery-related businesses and communities when developing the management measures proposed in Amendment 14. The long-term impacts of improving catch monitoring should also be positive for fishery-related businesses and communities. 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 14) on fishery-related businesses and communities. Some of the measures proposed in Amendment 14 are likely to impose a cost on the industry, and the impacts on fishery-related businesses and communities are therefore likely to be negative, at least in the short term. The measures that are most likely to result in negative impacts on fishery-related businesses and communities are the proposed requirements for industry funded observer coverage and potential closures related to RH/S mortality caps, but they may also result in the greatest benefits for RH/S conservation.

(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. Incidentally landed catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. The proposed measures should improve catch monitoring, which could help implement effective bycatch reduction measures. The RH/S mortality caps also create incentives for fishermen to avoid these non-target species.

(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. 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 Council, through consultation with the USCG, NMFS, and fishery participants, carefully weighed potential safety at sea considerations before making recommendations.

Anti-slippage measures, which potentially require trip termination due to slippage events, could potentially cause vessel masters to take fish aboard in dangerous conditions when they would otherwise not have done so. However, the final management measures proposed to address net slippage specifically authorize exceptions for slippage events in instances when vessel safety is a concern (as well as instances when gear is damaged or dogfish have overloaded a net).

9.2 OTHER REQUIRED PROVISIONS OF THE MAGNUSON-STEVENS ACT

Section 303 of the MSA contains 15 additional required provisions for FMPs, which are listed below. Nothing in this action is expected to contravene any of these required provisions.

(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, 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;

(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 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;

Section 6.3 of this document describes and identifies EFH in order to satisfy this provision.

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

The preparation of this amendment included a review of the scientific data that were available to assess the impacts of all alternatives in this amendment.

(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;

Section 7.5 of this document provides an extensive assessment of the likely effects of the actions proposed in this amendment on fishery participants and communities.

(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 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 any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

(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.

9.3 ESSENTIAL FISH HABITAT ASSESSMENT

The MSA / EFH Provisions (50 CFR 600.920(e)(3)) require that any Federal action which may adversely affect EFH must include a written assessment of the effects of that action on EFH. As describes in Section 7, there are not expected to be adverse impacts on EFH.

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10.0 Relationship to Other Applicable Law

10.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

10.1.1 Introduction

In order to consider a full range of alternatives related to this Amendment, the Council determined that the development of an EIS would be necessary to fulfill the requirements of NEPA. 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 to prepare this Amendment and the EIS in the *Federal Register* on June 9, 2010

The primary purposes of Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) are to:

> **Purpose A**: "**Implement Effective RH/S Catch Monitoring**" – Purpose A is to consider alternatives that would implement monitoring programs for the Mackerel, Squid, and Butterfish (MSB) fisheries that are sensitive enough and robust enough to the spatial and temporal variability of RH/S distributions so that good RH/S catch estimates can be generated. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires Councils "to specify the pertinent data which shall be submitted to the Secretary with respect to…fishing…in the fishery" (Section 303(a)(5)) and Section 8 under discretionary fishery management plan provisions allows implementation of observer requirements.
>
> **Purpose B**: "**Reduce RH/S Catch**" – Purpose B is to consider alternatives to reduce catch of RH/S in the MSB fisheries. The MSA requires Councils to minimize discards to the extent practicable (Section 301 – National Standard 9) and provides discretionary authority to "include management measures in the plan to conserve…non-target species…considering the variety of ecological factors affecting fishery populations" (Section 303(b)(12)). Because information on how much RH/S catch might be sustainable is lacking, it is not currently possible to quantify the impact on RH/S stocks of any catch reductions that may occur but such catch reductions would be likely to have a positive impact to some degree.
>
> **Purpose C**: "**Consider RH/S NS1 Stock Issues**" – Purpose C was to consider alternatives that would bring RH/S into the MSB plan as a managed stock in terms of Council management responsibilities, including annual catch limits and accountability measures, in order to improve overall RH/S management and conservation. In the DEIS, Alternative Set 9 considered whether to add RH/S as stocks in the fishery. Since the Council chose no action for that entire alternative set, and also has begun Amendment 15 to more fully consider the issue, the stock in the fishery issue has been moved into the "considered but rejected" section, 2.4 and is summarized there.

Potential measures being considered are detailed in Section 5 and summarized below:

Alternatives Related to Purpose A: Implement Effective RH/S Catch Monitoring

- **Alternative Set 1: Additional Vessel Reporting Measures**
- **Alternative Set 2: Additional Dealer Reporting Measures**
- **Alternative Set 3: Additional At-Sea Observation Optimization Measures**
- **Alternative Set 4: Port-side and Other Sampling/Monitoring Measures**
- **Alternative Set 5: At-Sea Observer Coverage Requirements**

Alternatives Related to Purpose B: Reduce RH/S Catch

- **Alternative Set 6 : Mortality Caps**
- **Alternative Set 7 : Restrictions in areas of high RH/S catch**
- **Alternative Set 8 : Hotspot Restrictions**

10.1.2 Development of EIS

The Council began the formal development of Amendment 14's EIS in 2010 following the publication of the supplemental Notice of Intent to prepare an EIS. The Council held a number of meetings of its Squid, Mackerel, and Butterfish (MSB) Committee, and Amendment 14's Fishery Management Action Team (FMAT). All of these meetings, as well as several related Council meetings, were open to the public.

10.1.3 List of Preparers and EIS Distribution List

This document was prepared by the Mid-Atlantic Fishery Management Council staff and other members of the Amendment 14 Fishery Management Action Team. Copies of this document and other associated documents are available from Dr. Christopher M. Moore, 114 Executive Director, Mid-Atlantic Fishery Management Council, Suite 201, 800 North State Street, Dover, DE 19901 or online at www.mafmc.org, in the section for MSB fisheries.

MSB Amendment 14 Fishery Management Action Team:

Jason Didden (MAFMC)
Aja Szumylo (NMFS)
Katherine Richardson (NMFS)
Dan Marone (NMFS)
Kiersten Curti (NMFS)
Lisa Hendrickson (NMFS)
Joel MacDonald & Denise Desautels (NOAA General Counsel)
David Stevenson (NMFS)
Andrew Kitts (NMFS)
Kate Taylor (ASMFC)

MAFMC MSB Committee (Past and Present):

Howard King, Chairman
Erling Berg, Vice-Chairman
Lee Anderson
Bob Beal (ASMFC)
Peter deFur
Tony DiLernia
Jim Gilmore
Pete Himchak
Stephen Linhard
Mike Luisi
John McMurray
Dave Miko
Laurie Nolan
Preston Pate
Steven Schafer
Vince O'Shea
Leroy Young
Christopher Zeman
Mary Beth Tooley (NEFMC)
David Pierce (NEFMC)

EIS Distribution List

United States Environmental Protection Agency (U.S. EPA), Region 1
Betsy Higgins
U.S. EPA New England
Five Post Office Square, Suite 100
Boston, MA 02109-3912

U.S.EPA, Region 2
Grace Musumeci
290 Broadway, 25th Floor
New York, NY 10007

U.S. EPA, Region 3
Bill Arguto
1650 Arch Street
Philadelphia, PA 19106
215.814.3367
arguto.william@epa.gov

U.S. EPA, Region 4
Chris Hoberg

61 Forsyth Street, SW
Atlanta, GA 30303

District Commander
First Coast Guard District
408 Atlantic Avenue
Boston, MA 02210

William Gibbons-Fly, Director
Office of Marine Conservation
Department of State
2201 "C" Street, N.W.
Washington, DC 20520

Timothy J. Ragan, Ph.D.
Acting Executive Director
Marine Mammal Commission
4340 East-West Highway
Bethesda, MD 20814

Willie R. Taylor
Office of Environmental Affairs
Department of Interior
1849 "C" Street, N.W.
Washington, DC 20520

NOAA Fisheries Service
Protected Species Division - angela.somma@noaa.gov
Office of Law Enforcement - dale.jones@noaa.gov
Sustainable Fisheries Division - galen.tromble@noaa.gov

10.2 MARINE MAMMAL PROTECTION ACT (MMPA)

The MAFMC has reviewed the impacts of Amendment 14 on marine mammals and has concluded that the proposed management actions are consistent with the provisions of the MMPA, and will not alter existing measures to protect the species likely to inhabit the management unit. For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 7.4 of this document.

10.3 ENDANGERED SPECIES ACT (ESA)

Section 7 of the ESA 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. Formal consultation on the MSB fishery was last completed on October 29, 2010. The October 29, 2010, Biological Opinion concluded that the operation of the MSB fishery is not likely to jeopardize the continued existence of listed species. Since the Atlantic sturgeon DPSs have been listed as endangered and threatened under the ESA, the ESA Section 7 consultation for the MSB fisheries has been reinitiated, and additional evaluation will be included in the resulting Biological Opinion to describe any impacts of the fisheries on Atlantic sturgeon and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated Biological Opinion will further reduce already low impacts to the species. NMFS found that the continued operation of these fisheries during the reinitiation period is not likely to jeopardize the continued existence of any Atlantic sturgeon DPS. This is based on the NMFS determination that the number of interactions with Atlantic sturgeon that may occur during this period is low and will only occur for a short period of time. Thus, this is not expected to increase the risk that the fisheries and associated research are jeopardizing any Atlantic sturgeon DPS.

10.4 COASTAL ZONE MANAGEMENT ACT

Section 307(c)(1) of the Federal Coastal Zone Management Act 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 Coastal Zone Management Act 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. Accordingly, NMFS has determined that this action would have no effect on any coastal use or resources of any state. Letters documenting the NMFS negative determination, along with this document, will be sent to the coastal zone management program offices of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. A list of the specific state contacts and a copy of the letters will be made available upon request.

10.5 ADMINISTRATIVE PROCEDURES ACT

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.

10.6 INFORMATION QUALITY ACT

Utility of Information Product

The proposed document includes: A description of the management issues, a description of the alternatives considered, and the reasons for selecting the management measures, to the extent that this has been done. These actions propose modifications to the existing FMP. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as well as all other existing applicable laws.

This proposed amendment was developed as part of a multi-stage process that involves review of the amendment document by affected members of the public. The public had the opportunity to review and comment on management measures at public hearings after the Council approved the public hearing document/DEIS. There will also be a comment period for the FEIS. The Federal Register notice that announces the proposed rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents:

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

Objectivity of Information Product

The category of information product that applies for this product is "Natural Resource Plans."

In preparing documents which amend the FMP, the Council must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas).

This amendment was developed to comply with all applicable National Standards, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures proposed to be implemented under this amendment are based upon the best scientific information available. This information includes NMFS dealer weighout data for 2007, which was used to characterize the economic impacts of the management proposals. These data, as well as the NMFS Northeast Fisheries Observer Program (NEFOP) database, were used to characterize historic landings, species co-occurrence in the MSB catch, and discarding. The specialists who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the MSB fisheries. Marine Recreational Fisheries Statistical Survey data were used to characterize the recreational fishery for Atlantic mackerel (the only species managed under this FMP with a significant recreational component).

The policy choices (i.e., management measures) proposed to be implemented by this amendment document are supported by the available scientific information and, in cases where information was unavailable, proxy reference points are based on observed trends in survey data. The management measures considered via this document are being designed to meet the conservation goals and objectives of the FMP, and prevent overfishing and rebuild overfished resources, while maintaining sustainable levels of fishing effort to ensure a minimal impact on fishing communities.

The supporting materials and analyses used to develop the measures in the amendment are contained in the amendment document and to some degree in previous amendments and/or FMPs as specified in this document.

The review process for this amendment involves the Mid-Atlantic Fishery Management Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have the opportunity to provide comments on the 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 amendment 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.

10.7 PAPERWORK REDUCTION ACT

The Paperwork Reduction Act concerns the collection of information. The intent of the Paperwork Reduction Act is to minimize the Federal paperwork burden for individuals, small businesses, state and local governments, and other persons as well as to maximize the usefulness of information collected by the Federal government. With significant changes to the catch monitoring program proposed for the MSB fisheries, Amendment 14 may contain new collection of information requirements subject to the Paperwork Reduction Act, including changes to vessel and dealer reporting requirements, notification requirements, and affidavit requirements, among other things (see Section 10.10.2). The Paperwork Reduction Act 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 implementation action is taken on Amendment 14.

10.8 IMPACTS RELATIVE TO FEDERALISM/E.O. 13132

This amendment does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 13132.

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10.9 Regulatory Flexibility Act/E.O. 12866

10.9.1 Regulatory Impact Review and Initial Regulatory Flexibility Analysis

This section provides the analysis and conclusions to address the requirements of Executive Order 12866 and the Regulatory Flexibility Act. Since many of the requirements of these mandates duplicate those required under the Magnuson-Stevens Act and NEPA, this section contains references to other sections of this document. The following sections provide the basis for concluding that the proposed actions are not significant under E.O. 12866 and will not have a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act.

10.9.2 Description of Management Objectives

The goals and objectives of the management plan for the MSB resources are stated in Section 4.3 of this document. The proposed actions are consistent with, and do not modify those goals and objectives.

10.9.3 Description of the Fisheries

Section 6.1 of this document contains a detailed description of the fisheries managed under this FMP.

10.9.4 Statement of Problem/Need for Action

The purpose and need for this action were summarized in the Executive Summary, 10.1, and further described in Section 4.1 of this document.

10.9.5 Description of the Alternatives

The potential measures being considered were summarized in the Executive Summary, 10.1, and further described in Section 5 of this document.

10.9.6 Economic Analysis

The economic impacts of the alternatives in this amendment are discussed in Section 7.0 of this document.

10.9.7 Determination of Significance under E.O. 12866

NMFS Guidelines provide criteria to be used to evaluate whether a proposed action is significant. A significant regulatory action means any regulatory action that is likely to result in a rule that may:

1. *Have an annual effect on the economy of $100 million or more, or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities.*

The proposed actions are not expected to have an effect on the economy in excess of $100 million because the mackerel and longfin squid fisheries, the two fisheries that are impacted by the proposed actions, have a combined value of about $20-$33 million dollars 2008-2010. It is expected that the group of alternatives that has been selected as preferred will achieve the desired RH/S monitoring and catch reduction goals in a practicable manner. In addition, costs incurred by the mackerel and longfin squid fisheries could be offset by gains made relative to RH/S conservation.

2. *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.*

The proposed actions will not create a serious inconsistency with or otherwise interfere with an action taken or planned by another agency. No other agency has indicated that it plans an action that will interfere with the MSB fisheries in the EEZ.

3. *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.*

The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees or loan programs, or the rights and obligations of their participants.

4. *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.*

The considered actions do not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866. The considered actions have generally been considered in other fisheries managed by NMFS.

10.9.8 Initial Regulatory Flexibility Analysis

The following sections contain analyses of the effect of the proposed action on small entities. Under Section 603(b) of the Regulatory Flexibility Act, each initial regulatory flexibility analysis is required to address:

1. Reasons why the agency is considering the action,
2. The objectives and legal basis for the proposed rule,
3. The kind and number of small entities to which the proposed rule will apply,
4. The projected reporting, record-keeping and other compliance requirements of the proposed rule, and
5. All Federal rules that may duplicate, overlap, or conflict with the proposed rule.

10.9.9 Reasons for Considering the Action

The needs and purposes for action are described in Section 5 of this document.

10.9.10 Objectives and Legal Basis for the Action

Amendment 14 was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) 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 (MSA), which amended and reauthorized the MSFCMA and included a new emphasis on precautionary fisheries management. New provisions mandated by the MSA require managers to end overfishing and rebuild overfished stocks within specified time frames, minimize discards and discard mortality to the extent practicable, and identify and protect essential fish habitat (EFH). This document presents and evaluates management alternatives and measures to achieve specific goals and objectives for the Atlantic mackerel, squid and butterfish fisheries (Section 4.0). The associated document was prepared by the Mid-Atlantic Fishery Management Council (Council) in consultation with the National Marine Fisheries Service (NMFS, NOAA Fisheries).

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

The Regulatory Flexibility Act requires the Federal rulemaker to examine the impacts of proposed and existing rules on small businesses, small organizations, and small governmental jurisdictions. In reviewing the potential impacts of proposed regulations, the agency must either certify that the rule Awill not, if promulgated, have a significant economic impact on a substantial number of small entities or prepare a final regulatory flexibility analysis. The Small Business Administration defines a small business in the commercial fishing sector as a firm with receipts (gross revenues) of up to $4.0 million. Party/charter small businesses are included in NAICS code 487210 and are defined as a firm with gross receipts of up to $7 million.

The measures in this amendment could affect any vessel holding an active Federal permit for Atlantic mackerel, longfin squid, *Illex* or butterfish, as well as vessels that fish for any one of these species in state waters. According to NMFS permit file data, in 2010, 2,201 commercial vessels possessed Atlantic mackerel permits, 351 vessels possessed longfin squid/butterfish moratorium permits, 76 vessels possessed *Illex* permits, 1904 vessels possessed incidental catch permits and 831 vessels possessed squid/mackerel/butterfish party/charter permits. In 2010 all of the relevant commercial vessels had revenues less than $4.0 million. While gross revenue data is not available for the party/charter sector, it is a reasonably safe presumption that almost all if not all of the party/charter vessels would qualify as a small business. Many vessels participate in more than one of these fisheries; therefore, permit numbers are not additive. The distribution of permitted and active vessels by state may be found in Section 6.

Since all permit holders may not actually land any of the four species, the more immediate impact of the considered measures may be felt by the commercial vessels that are actively participating in these fisheries (see active vessel tables in Section 6 above). An active participant was defined as being any vessel that reported having landed one or more pounds of any one of the four species in the Northeast dealer data during calendar year 2010, and there were 488 such vessels. Tables 30, 41, 51, and 61 provide the numbers of permitted and substantially active (greater than 1,000 pounds of a species) for mackerel, Illex, butterfish, and longfin respectively. NMFS weighout databases cover activity by unique vessels that hold a Federal permit of any kind and provides summary data for vessels that fish exclusively in state waters. This means that an active vessel may be a vessel that holds a valid Federal Atlantic mackerel, squid, or butterfish permit, a vessel that holds a valid Federal permit but no Atlantic mackerel, squid, or butterfish permit; a vessel that holds a Federal permit other than Atlantic mackerel, squid, or butterfish permit and fishes for those species exclusively in state waters; or may be a vessel that holds no Federal permit of any kind. Of the four possibilities the number of vessels in the latter two categories cannot be estimated because the dealer data provides only summary information for state waters vessels and because the vessels in the last category do not have to report landings.

Not all landings and revenues reported through the Federal dealer data can be attributed to a specific vessel. Vessels with no Federal permits are not subject to any Federal reporting requirements with which to corroborate the dealer reports. Thus, it is possible that some vessel activity cannot be tracked with the landings and revenue data that are available. Thus, these vessels cannot be included in the threshold analysis, unless each state were to report individual vessel activity through some additional reporting system - which currently does not exist. This

problem has two consequences for performing threshold analyses. First, the stated number of entities subject to the regulation is a lower bound estimate, since vessels that operate strictly within state waters and sell exclusively to non-Federally permitted dealers cannot be counted. Second, the portion of activity by these uncounted vessels may cause the estimated economic impacts to be over- or underestimated.

The effects of actions were analyzed by employing quantitative approaches to the extent possible. In the current analysis, effects on profitability associated with the management measures should be evaluated by looking at the impact the measures on individual vessel costs and revenues. However, in the absence of cost data for individual vessels engaged in these fisheries, changes in gross revenues are used a proxy for profitability.

10.9.12 Recordkeeping and Reporting Requirements

The following measures could entail additional recordkeeping and reporting requirements and will be evaluated per the Paperwork Reduction Act as appropriate.

1b (weekly VTRs)
1c (weekly VTRs)
1d (pre-trip notifications)
1e, f, g (VMS reporting requirements)
2b (Standard Atlantic Fisheries Information System confirmations)
2c, 2d, 2e, 2f (requirement for weighing fish)
3e, 3j, 8d (released catch affidavits)
4b, 4c (dockside monitoring)
4d, 4e (hold certifications)
5 (all) Require communication with observer providers and NMFS

10.9.13 Duplication, Overlap, or Conflict with Other Federal Rules

The proposed action does not duplicate or conflict with any other Federal rules. There is some natural overlap between the Atlantic Mackerel and Atlantic Herring fisheries and this overlap and the regulations for the Atlantic herring fishery were taken into consideration during the development of this amendment.

10.9.14 Economic Impacts on Small Entities

All of the small entities described in 10.10.11 could be impacted by this action to some degree. Economic impacts for each alternative are detailed in Section 7 of this document (starts on page 274).

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Appendix 1 - RH/S Abundance and Distribution

FMAT Working Paper (DO NOT CITE) **9/15/2011**

Part I. Analyses for Amendment 14 to the Atlantic mackerel, squid and butterfish Fishery Management Plan

1.0 Survey relative abundance and biomass indices

1.1 Background

The Atlantic States Marine Fisheries Commission (ASMFC) is currently conducting a river herring (*Alosa pseudoharengus*, alewife, and *Alosa aestivalis*, blueback herring) stock assessment, but the results are not yet available. The most recent stock assessment of American shad (*Alosa sappidissima*) was conducted using data through 2005 (ASMFC 2007), but hickory shad *Alosa mediocris* has not been assessed. Therefore, in order to evaluate trends in oceanic population sizes, relative abundance and biomass indices were derived for these species using catch data from research bottom trawl surveys conducted by the NEFSC on the eastern US continental shelf. These anadromous species spend most of their lives in oceanic waters but migrate into freshwater to spawn.

The oceanic ranges of all four species extend beyond the northern and southern latitudinal range of the NEFSC spring and fall surveys, which occur from the Gulf of Maine to Cape Hatteras, NC (35° 30' to 44° 30' N). The geographic range of blueback herring in the northwest Atlantic extends from Cape Breton, Nova Scotia, to the St. Johns River in FL and the range of American shad extends from the Sand Hill River in Labrador to the St. John's River in FL (Page and Burr 1991). The geographic range of alewife extends from Red Bay, Labrador, to SC. Hickory shad have a narrower geographic range than these three species and is most abundant between Cape Cod, MA and the St. John's River in FL, but is also infrequently found in the Gulf of Maine (Munroe 2002).

1.2 Methods

The NEFSC conducts annual bottom trawl surveys, between the Gulf of Maine and Cape Hatteras, North Carolina, using a stratified random design. Standardized tows were conducted for 30 minutes at 3.5 knots until 2009 when a new research vessel replaced the SRV *Albatross IV* and the towing protocol changed to a duration of 20 minutes at 3.0 knots. Details regarding the survey design and sampling protocols are described in Azarovitz (1981). Inshore strata (8-27 m) and offshore strata (27-366 m) have been most consistently sampled by the SRVs *Albatross IV* and *Delaware II* since the fall of 1975 and spring of 1976. Prior to these time periods, either only a portion of the survey area was sampled or a different vessel and gear were used to sample the inshore strata (Azarovitz 1981). Although winter surveys (February) were conducted during 1992-2007, the sampling area only covered a subset of offshore strata (e.g., no sampling in the Gulf of Maine) and employed sampling gear different from that used during the spring and fall surveys.

Indices of relative abundance (stratified mean number per tow) and biomass (stratified mean kg per tow) were derived, for alewife, blueback herring, and American shad, using data from NEFSC spring (1976-2011) and fall (1975-2010) bottom trawl surveys. Indices were not computed for hickory shad because the species was caught in low numbers at only a few stations during a few years (i.e., at 18 stations during 9 years and at 16 stations during 10 years for the spring and fall surveys, respectively). For the time series utilized, sampling during the fall and spring surveys generally occurred during September-November and March-April, respectively, in a south to north direction (Figure 1).

Catches from all inshore and offshore survey strata located between Cape Hatteras, NC and the northern Gulf of Maine (Figure 1) were used to compute the survey indices for each of three species because preliminary evaluations of the spatial distribution of each species indicated high degrees of interannual variability. In addition, both tagging data (Boreman 1981) and correlation analyses (ASMFC 2008) suggest riverine stocks become mixed within their oceanic habitat. For most of the blueback and alewife time series analyzed, correlation coefficients were not significant for comparisons between time series of New England run sizes and spring survey relative abundance indices for nearby coastal areas, the latter which included indices derived from two subsets of NEFSC survey strata.

Beginning in 2009, the SRV *H. B. Bigelow* replaced the SRV *Albatross IV* as the primary survey vessel. As a result, the two shallowest series of inshore strata (8-18 m depths) are no longer sampled due to the deeper draft of the *Bigelow*. These inshore strata constitute important habitat during both the fall and spring survey periods for all of the species analyzed herein. Since the fall of 2007, inshore areas of 6.1 to 18.3 m have been sampled during a separate bottom trawl survey, the Northeast Area Monitoring and Assessment Program (NEAMAP) survey, conducted between Long Island and Cape Hatteras, NC. The NEAMAP survey is conducted during the fall (late Sept.-mid-Oct., which is similar to the timing of the NEFSC fall survey) and during spring (late April-mid-May, which is later than the NEFSC spring survey. Approximately 150 stations are sampled with fourteen of the stations located in Block Island Sound and Rhode Island Sound at slightly deeper depths of 18.3 m to 36.6 m (Bonzek et al. 2009). The cruise track is from south to north during spring surveys and from north to south during fall surveys. The NEAMAP surveys are conducted between sunrise and sunset and use the same towing protocol (20 minutes at 3.0 knots) that has been used since 2009 to conduct the NEFSC surveys. Although a different vessel is used during the NEAMAP surveys, the gear is the same as that used by the *Bigelow*, with the exception of a 3-inch cookie sweep rather than the rockhopper sweep used by the *Bigelow*. There are no calibration factors available with which to convert the NEAMAP survey catches to *Bigelow* catches. However, swept-area biomass estimates from the spring and fall NEAMAP surveys were available and are presented herein along with the length compositions of the catches (C. Bonzek, pers. comm.).

1.2.1 Catch conversion factors

Vessel, door and net changes have occurred during the NEFSC bottom trawl surveys, resulting in the need for conversion factors to adjust the survey catches for some species. A Yankee #36 net was used to conduct the spring and fall surveys, with the exception of spring surveys conducted during 1973-1981 for which a Yankee #41 net was used. A trawl door change occurred in 1985. However, there are no net or door conversion factors available to adjust the survey indices for the three species being evaluated herein. During some years, both the SRV *Albatross IV* and the SRV *Delaware II* were used to conduct the surveys. However, a vessel conversion factor is only available for alewife. A vessel conversion factor of 0.58 was applied to the alewife weight per tow indices. Alewife number per tow indices did not require a conversion factor because there was no significant difference between the numbers of alewife caught by each vessel (Byrne and Forrester 1991).

Beginning in 2009, the NEFSC SRV *Albatross IV* was replaced with the SRV *Henry B. Bigelow*. The new vessel is quieter and the increased headrope height of the Bigelow's net has improved the catchability of pelagic species like those being evaluated herein. In order to extend the NEFSC spring and fall survey time series beyond 2008, vessel calibration factors were applied to the *Bigelow* catches of each of the three species to convert them to *Albatross* equivalents. Bottom trawl catches of the subject alosid species tend to be higher during the daytime because of diel migration patterns (Neves and Despres 1979; Loesch et al. 1982; Stone and Jessop 1992). Additional variance is associated with time-of-day conversion factors used to adjust nighttime catches to daytime equivalents. In addition, the time-of-day used to separate "day" tows from "night" tows is most often arbitrarily selected. In order to avoid these pitfalls, only daytime tows were used to compute the relative abundance and biomass indices. Daytime tows (i.e., tows between sunrise and sunset) were defined based on solar zenith angle. Sunrise and sunset were determined for each survey station based on sampling date, location, and solar zenith angle using the method of Jacobson et al. 2011. Although there is a clear general relationship between solar zenith and time of day, tows carried out at the same time but at different geographic locations may have substantially different irradiance levels that might affect survey catchability to different extents (NEFSC 2011). Daytime catch number and weight calibration factors (Table 1) were computed for alewife and blueback herring using the method of Miller et al. (2010) and were applied to survey indices from 2009 onward to convert SRV *Bigelow* catches to SRV *Albatross* equivalents. The calibration factors were combined across seasons due to the low within-season sample sizes from the 2008 calibration studies (i.e., < 30 tows with positive catches by one or both vessels). American shad were caught in fewer than 30 tows during each of the 2008 calibration studies, so estimates of daytime-based conversion factors were not possible. Instead, American shad indices for 2009

onward were converted to *Albatross* equivalents using conversion factors based on all tows regardless of when they occurred.

The NEFSC survey database contained some records with catches of a small number of individuals for which the catch weight data are missing. For such records, which occurred primarily during the spring surveys, the spring numbers-at-length were converted to catch weight values using species-specific spring survey length-weight equations (Table 2).

1.3 Results and Discussion

1.3.1 Survey indices

NEFSC spring surveys occur during March and April when mature individuals, for the subject anadromous species, are migrating shoreward and into rivers and streams to spawn. The timing of spring spawning migrations into freshwater occurs earliest in the southern portion of each species' geographic range then progress northward and blueback herring generally spawn later in the spring than alewives (Boreman 1981). Latitudinal trends in fall emigration patterns also occur. Juvenile American shad emigrate seaward during the fall from northern rivers first and those from southern areas emigrate progressively later (Leggett 1977). A similar north-to-south emigration trend exists for river herring, but alewives emigrate before blueback herring (Boreman 1981). The NEFSC survey cruise track follows a general south to north direction during both the spring and fall surveys. The distribution of each species during the spring and fall surveys depends on the timing of the survey in relation to the timing of seasonal and annual migration patterns of each of the four subject species. The timing of the NEFSC spring and fall surveys has been variable and this may have affected availability of the subject species to the survey gear. During most years, the mean Julian dates of the fall surveys ranged between 270 and 290 and ranged between 84 and 102 for the spring surveys. The spring and fall spatial distributions of each species are described below in Section 2.0.

Relative abundance and biomass indices could not be computed for hickory shad because catch rates for both surveys were very low during the few years for which the species was caught (Figure 2). For the other three species, spring and fall survey indices exhibited considerable inter-annual variability, and in general, were more informative for the spring surveys because each of the species was caught at more stations (Figures 3-5). Consequently, the precision of the spring survey indices was higher than for the fall survey indices (Tables 3-8). Fall relative abundance of blueback herring has been above the median since 2002 and the 2009 and 2010 indices were the highest of the time series (Figure 3). Spring relative abundance has been above the median since 2006. Alewives were caught at more stations and in higher numbers than blueback herring and an obvious increase in fall relative abundance was evident for 2008-2010; the highest three years of the time series (Figure 4). Spring relative abundance of alewives was above the median during 2008-2011 and was the highest of the time series in 2011. Interannual variability in the fall relative abundance of American shad was extremely high, but has been above the median during most years since 1992 (Figure 5). Spring relative abundance of

American shad has fluctuated above and below the median for multi-year periods and was highest during 1990-1997, but then declined through 2005 but has generally been above the median since 2006 (Figure 5).

Swept area abundance (log number per 25,000 m^2) and biomass (log kg per 25,000 m^2) estimates of blueback herring, alewife and American shad were available for spring NEAMAP surveys during 2008-2011, but were only available for alewives during the fall (2007-2010) surveys because fall catch rates of blueback herring and American shad were too low (Figures 6-8). Only the fall 2010 abundance estimate for alewife was significantly different from the rest of the values in its respective time series (Figure 7). The NEAMAP time series is short, and because it only covers a small portion of the entire survey area, it is not clear whether the indices are measuring relative abundance within the NEAMAP survey area or migrations between the NEAMAP and NEFSC survey areas or between the NEAMAP strata and estuarine habitat of the subject species. For example, distribution maps from a seasonal, stratified random bottom trawl survey conducted in the Hudson-Raritan estuary, during 1992-1997, indicate that river herring utilize this estuarine habitat during the time that the spring and fall NEAMAP and NEFSC surveys are conducted and were not present in the estuary during the summer (NEFSC 1998).

1.3.2 Survey length compositions

Length compositions of the survey catches during the 1976-2008 spring and fall surveys are shown as stratified mean numbers per tow for each of the three species. Fall survey length distributions of blueback herring (modes at 15 and 24 cm FL) and alewife (modes at 18 and 23 cm FL) were bimodal. Similar size modes were present during the spring surveys, but a third mode of smaller individuals (at 9 cm for blueback and 11 cm for alewife) was also present (Figure 9). Limited data from age-length keys for NEFSC spring surveys indicate that the 9 and 11 cm modal groups consist of age 1 fish. Spring NEAMAP survey catches of blueback herring are dominated by age 1 fish which were caught in very large numbers during the 2011 spring survey (Figure 10). Age 0 fish were not present in either the NEAMAP or NEFSC surveys. Age data for blueback herring caught in NEFSC fall surveys is lacking.

American shad length distributions were unimodal during the fall surveys (mode at 22 cm FL) and bimodal during the spring surveys, with modes at 16 and 25 cm FL (Figure 9). There are no age data from NEFSC surveys for either of the shad species. The spring NEAMAP survey catches of American shad were dominated by small fish within the 13 cm modal size group and also consisted of a second modal size group of 20 cm (Figure 10).

2.0 Species-specific seasonal and interannual spatial distributions

2.1 Background

Limited tagging studies indicate that extensive coastwide migrations are undertaken by river herring (Boreman 1981). For example, a blueback herring tagged off South Carolina was recovered as far north as Cape Cod (Curtis 1971). American shad also undergo lengthy migrations. Shad tagged in the Gulf of Maine, where they spend the summer and fall, were recovered in areas located between Quebec and Georgia (Cheek 1968).

2.2 Methods

Several methods were used to characterize the seasonal and annual spatial distribution patterns of American shad, hickory shad, alewife and blueback herring on the Northeast continental shelf using data collected during NEFSC and NEAMAP surveys. Catch rate data included in the spatial analyses include numbers per tow from the 1976-2010 spring surveys and the 1975-2010 fall surveys for the same set of strata used to compute relative abundance and biomass indices. As explained above in Section 1.2, data from surveys conducted prior to these time periods were excluded from the analyses because important habitat of the subject species was either not sampled or sampled by a vessel for which conversion factors are not available.

Maps of density data, including tows with zero catch, collected during NEFSC and NEAMAP (2009 onward) surveys were generated for each year of the spring and fall time series, as well as for the spring and fall time series, using ArcGIS v. 10 © ESRI. A spatial statistical tool, the standard deviational ellipse, was used to characterize the interannual variability in the spatial distributions of each species as well as to define the geographical extents of the distribution time series for each species. The method involves computation of the standard deviation of the latitudinal and longitudinal coordinates from the mean center of the density distribution to define the axes of the ellipse and thereby define the orientation of the distribution. Each ellipse encompasses one standard deviation, or 68% of all density values, from the centroid of the distribution.

A second method was used to define offshore habitat areas with the highest cumulative densities of each species for the spring and fall survey time series. The same method, which involves post-stratification of the NEFSC and NEAMAP survey data, was previously used to generate Essential Fish Habitat maps for Amendment 11 to the MSB FMP (MAFMC 2011). NEFSC and NEAMAP catch rate data were mapped by ten-minute square (TNMS) as cumulative percentages (75, 90, 95, and 100%) of the back-transformed mean catch densities (representing a pseudo-geometric mean). The mean catch density per TNMS ($\overline{d}_j$) was computed as:

$$\overline{d}_j = \sum_{i=1}^{n_j} \frac{(\ln(d_i)+1)_j}{n_j}$$

where $(\ln(d_i)+1)_j$ is the log-transformed density plus 1 at station *i* for TNMS *j* and n_j is the number of stations sampled within each TNMS. Although this method introduces a slight bias, the back-transformed mean of the log(X+1) observations has some resistance to the effects of outliers and reduces potential distortions introduced when large values occur. Skewed catch density distributions, attributable to infrequent, large-magnitude catches, are common for pelagic schooling species such as those being analyzed herein. Mean densities were not computed for TNMS where fewer than four tows were conducted during the time series.

2.3 Results and Discussion

Inter-annual variability in the sizes and locations of the habitat areas occupied by of each of the four species are important considerations for determining whether closed areas would be beneficial in reducing the incidental catches of these species. Maps showing the one standard deviational ellipses for all years combined (red ellipses) suggest that bluebacks, alewives and American shad are distributed across smaller geographic areas during the fall (Figures 11-13), primarily in the western and northern Gulf of Maine and to a lesser extent in southern New England, than during the spring (Figures 14-16). The same maps also show that the "envelopes" of all of the annual standard deviational ellipses for each species (dashed lines) are much larger for the spring time series than for the fall time series, indicating greater inter-annual variability in the sizes and locations of the three species spatial distributions during the spring than during the fall. Catches of hickory shad were very low for both the fall and spring survey time series, and consequently, distributions of the species are only presented as density-per tow maps for each of the two time series (Figures 17 and 18, respectively).

Examples of annual standard deviational ellipse maps, during three consecutive years, show the high degree of interannual variability in the spatial distributions of the subject species, particularly during spring surveys. Figure 19 indicates that alewives are less abundant in the fall NEFSC surveys than during the spring surveys (Figure 20) and that the species is much more broadly distributed during the spring, extending along most of the shelf between the Gulf of Maine and Cape Hatteras, NC. Stations with the highest densities during the spring surveys were broadly dispersed, rather than clustered within small localized areas, and their locations changed annually (e.g., in southern New England during 1996 and 1997 but in also in the Gulf of Maine during 1998). Similarly high levels of interannual variability occurred in the fall and spring spatial distributions of blueback herring (Figures 21 and 22) and American shad (Figures 23 and 24).

Maps showing cumulative percentages (75, 90, 95 and 100%) of the geometric mean densities of *Alosa pseudoharengus, A. aestivalis,* and *A. sapidissima* during the 1975-2010 NEFSC fall bottom trawl surveys indicate that the highest mean densities (75%) of all three species occurred in the western Gulf of Maine and in southern New England south of Cape Cod and east of Long Island (Figure 25). During the spring surveys, the highest mean densities of each species occurred across much broader areas than during the spring surveys, within both the Gulf of Maine and from Cape Cod to Cape Hatteras, NC (Figure 26).

Maps of the spatial distributions of Atlantic mackerel and Atlantic herring indicate that during NEFSC fall bottom trawl surveys, the densities of both species were highest in the Gulf of Maine, but during the spring surveys both species were much more broadly distributed across the continental shelf, between Cape Hatteras and the Gulf of Maine, similar to the spring and fall distributions of the subject bycatch species (Figures 27). The high degree of interannual variability in the spring and fall spatial distributions of all three species is an important consideration with respect to implementation of closed area management measures to reduce the bycatch of these species.

3.0 Literature cited

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Table 1. Calibration factors used to convert daytime (between sunrise and sunset) SRV *Albatross IV* catches to SRV *Henry B. Bigelow* equivalents for NEFSC spring and fall bottom trawl survey catches for 2009 onward.

	Number per tow	SE	Kg per tow	SE
Alewife	1.0532	0.1569	0.7165	0.1127
Blueback herring	0.8706	0.1710	1.5943	0.4456

Table 2. Sample sizes and parameter estimates for NEFSC spring survey length-weight relationships for *Alosa aestivalis*, *Alosa pseudoharengus*, and *Alosa sapidissima*.

Species	ln(a)	b	r^2	N fish
Alosa aestivalis	-12.943	3.4827	0.97	1,532
Alosa pseudoharengus	-12.898	3.5023	0.94	132
Alosa sapidissima	-12.508	3.3323	0.99	780

Table 3. Stratified mean number per tow and mean weight (kg) per tow indices for blueback herring caught during daytime tows (between sunrise and sunset) in NEFSC fall bottom trawl surveys, 1975-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1975	0.05	100.0	0.010	100.0
1976	0.07	14.4	0.002	88.1
1977	0.64	97.1	0.144	96.6
1978	0.28	42.6	0.049	48.1
1979	0.03	45.5	0.007	50.1
1980	1.00	99.9	0.042	99.7
1981	0.02	49.7	0.006	39.7
1982	0.00	100.0	0.000	100.0
1983	0.05	71.0	0.014	71.0
1984	0.05	18.5	0.006	34.0
1985	0.08	75.4	0.012	86.1
1986	0.03	46.7	0.005	54.4
1987	0.02	56.8	0.004	52.7
1988	0.00		0.000	
1989	0.02	70.7	0.004	70.7
1990	0.00		0.000	
1991	0.09	70.7	0.011	88.7
1992	0.00		0.000	
1993	0.05	75.3	0.003	56.0
1994	0.52	4.6	0.027	8.9
1995	0.25	2.6	0.029	2.3
1996	0.04	0.0	0.001	0.0
1997	0.16	54.4	0.019	56.9
1998	0.00		0.000	
1999	0.01	25.4	0.002	31.1
2000	0.20	35.1	0.028	29.9
2001	0.05	9.7	0.004	12.7
2002	0.59	58.5	0.090	61.5
2003	0.31	25.7	0.046	22.9
2004	0.65	5.8	0.031	16.1
2005	0.48	2.5	0.028	3.5
2006	0.08	58.6	0.011	69.4
2007	0.10	28.4	0.008	33.9

2008	0.36	10.6	0.040	12.8
2009	2.30	58.5	0.066	61.4
2010	1.59	18.0	0.081	20.7

Table 4. Stratified mean number per tow and mean weight (kg) per tow indices for blueback herring caught during daytime tows (between sunrise and sunset) in NEFSC spring bottom trawl surveys, 1976-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1976	2.64	31.1	0.141	26.6
1977	1.03	27.6	0.111	29.5
1978	2.76	19.6	0.297	31.5
1979	11.79	23.3	1.522	43.4
1980	4.64	48.8	0.266	30.1
1981	5.69	34.6	0.377	46.4
1982	1.25	19.8	0.087	33.7
1983	1.60	21.2	0.153	26.9
1984	9.47	52.6	0.946	55.4
1985	2.22	29.6	0.282	42.2
1986	2.53	12.2	0.075	28.6
1987	2.25	11.8	0.230	10.1
1988	1.12	21.6	0.060	24.7
1989	0.96	26.7	0.060	30.4
1990	0.79	22.2	0.052	28.3
1991	0.58	18.5	0.032	45.2
1992	2.99	49.1	0.310	73.6
1993	5.37	15.1	0.195	21.0
1994	2.20	23.1	0.127	36.0
1995	4.19	16.8	0.285	5.5
1996	2.41	16.2	0.155	24.5
1997	1.85	16.2	0.151	18.0
1998	0.91	28.6	0.026	31.7
1999	2.19	21.6	0.162	23.7
2000	1.35	34.0	0.142	52.0
2001	0.77	23.7	0.055	22.3
2002	0.71	14.8	0.070	19.8
2003	2.55	17.6	0.133	12.8
2004	2.80	23.9	0.133	38.8
2005	0.76	18.9	0.029	22.0
2006	7.11	25.2	0.178	36.8
2007	6.07	29.2	0.390	28.0
2008	2.24	28.9	0.100	36.8
2009	13.95	64.5	0.656	76.5
2010	3.26	30.3	0.129	40.5
2011	2.83	22.6	0.109	29.8

Table 5. Stratified mean number per tow and mean weight (kg) per tow indices for alewife caught during daytime tows (between sunrise and sunset) in NEFSC fall bottom trawl surveys, 1975-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1975	1.00	33.6	0.20	29.2
1976	2.38	5.6	0.31	6.3
1977	0.75	39.2	0.09	36.4
1978	0.85	24.0	0.10	20.3
1979	0.80	43.4	0.14	38.2
1980	6.41	67.5	0.45	60.1
1981	2.32	44.4	0.25	14.9
1982	0.72	6.2	0.08	15.3
1983	0.38	29.3	0.07	33.8
1984	0.87	70.3	0.07	50.9
1985	2.36	67.4	0.36	78.9
1986	0.98	18.9	0.19	20.1
1987	1.43	27.3	0.30	24.3
1988	1.59	18.3	0.18	11.6
1989	1.77	37.5	0.13	21.8
1990	1.11	26.0	0.09	40.1
1991	1.65	5.2	0.09	11.5
1992	1.08	22.3	0.13	33.4
1993	1.19	23.0	0.06	13.7
1994	3.45	41.0	0.43	35.9
1995	4.30	10.4	0.58	14.1
1996	0.64	32.2	0.08	43.0
1997	0.93	18.8	0.10	22.6
1998	4.81	32.9	0.41	30.7
1999	1.20	33.4	0.14	34.2
2000	4.55	19.5	0.56	15.9
2001	0.47	20.6	0.06	14.2
2002	5.71	37.8	0.96	48.2
2003	2.04	21.4	0.33	12.3
2004	2.76	34.9	0.25	23.1
2005	5.04	15.6	0.46	23.3
2006	5.36	42.4	0.63	37.4
2007	2.50	14.8	0.35	12.9
2008	7.32	18.0	1.04	23.3
2009	6.37	14.6	0.72	14.9
2010	10.85	24.4	1.82	20.6

Table 6. Stratified mean number per tow and mean weight (kg) per tow indices for alewife caught during daytime tows (between sunrise and sunset) in NEFSC spring bottom trawl surveys, 1976-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1976	6.72	34.6	0.91	40.7
1977	5.44	30.1	0.96	31.9
1978	8.30	14.8	0.95	10.7
1979	12.64	41.9	1.44	43.5
1980	15.18	29.9	1.19	30.0
1981	8.99	28.3	1.00	27.4
1982	7.05	22.7	0.69	23.4
1983	3.28	30.8	0.64	44.1
1984	5.03	36.8	0.89	45.7
1985	2.52	20.1	0.39	24.2
1986	4.04	26.8	0.60	21.9
1987	7.93	9.7	1.30	9.1
1988	2.96	14.6	0.40	16.0
1989	4.08	18.8	0.35	21.1
1990	5.00	14.3	0.33	16.2
1991	6.24	34.9	0.48	51.5
1992	13.86	6.8	2.10	5.5
1993	10.33	18.3	0.76	16.8
1994	6.96	24.4	0.32	20.5
1995	6.95	26.9	0.99	29.4
1996	14.87	33.8	1.55	33.7
1997	11.85	25.4	1.60	29.3
1998	11.93	17.8	1.22	19.9
1999	14.65	24.3	1.51	26.5
2000	12.45	51.3	0.83	18.3
2001	5.99	24.8	0.71	33.4
2002	7.35	10.2	0.97	13.8
2003	8.57	22.9	0.59	25.7
2004	10.95	23.7	0.85	35.8
2005	4.72	15.8	0.27	24.7
2006	16.88	21.7	0.66	21.9
2007	5.87	17.9	0.56	17.4
2008	8.51	24.4	0.61	22.2
2009	15.94	14.6	1.57	12.4
2010	14.61	11.5	1.41	11.8
2011	37.72	16.2	2.51	21.3

Table 7. Stratified mean number per tow and mean weight (kg) per tow indices for American shad caught during daytime tows (between sunrise and sunset) in NEFSC fall bottom trawl surveys, 1975-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1975	0.01	49.2	0.01	61.6
1976	0.24	26.0	0.06	21.2
1977	0.03	79.9	0.02	66.9
1978	0.31	56.9	0.08	40.3
1979	0.08	38.9	0.04	32.4
1980	0.15	70.6	0.03	53.0
1981	0.59	40.6	0.12	30.6
1982	1.14	4.6	0.26	17.3
1983	0.66	94.8	0.13	91.0
1984	0.04	44.8	0.01	39.7
1985	0.11	30.8	0.02	32.5
1986	0.05	31.9	0.02	44.1
1987	1.17	8.4	0.37	20.9
1988	0.07	44.8	0.01	33.8
1989	0.11	25.7	0.03	35.5
1990	0.12	27.6	0.07	83.3
1991	0.05	46.9	0.02	60.8
1992	4.21	86.8	0.57	73.9
1993	0.08	47.8	0.02	43.5
1994	0.96	51.8	0.15	51.1
1995	0.65	51.7	0.60	67.3
1996	0.28	51.4	0.08	38.3
1997	0.19	40.9	0.09	49.1
1998	0.22	23.1	0.10	32.1
1999	0.16	57.9	0.03	59.8
2000	0.27	30.6	0.07	33.9
2001	0.07	18.9	0.03	21.7
2002	0.20	33.9	0.13	42.0
2003	0.21	38.0	0.08	14.9
2004	0.16	28.7	0.06	30.7
2005	0.16	54.6	0.07	81.7
2006	0.23	27.1	0.04	25.5
2007	0.17	25.5	0.04	28.1
2008	0.59	51.6	0.28	78.1
2009	0.10	32.5	0.03	35.2
2010	0.28	20.2	0.11	34.8

Table 8. Stratified mean number per tow and mean weight (kg) per tow indices for American shad caught during daytime tows (between sunrise and sunset) in NEFSC spring bottom trawl surveys, 1976-2010. CVs for indices from 2009 onward do not account for the additional variance associated with SRV *H. B. Bigelow* conversion factors.

YEAR	Mean number per tow	CV	Mean kg per tow	CV
1976	0.22	38.2	0.05	45.2
1977	0.04	58.3	0.00	55.0
1978	0.15	20.8	0.07	16.1
1979	0.52	32.2	0.12	33.7
1980	0.25	15.8	0.07	26.6
1981	0.40	37.6	0.09	32.1
1982	0.25	30.2	0.05	30.3
1983	0.18	25.4	0.07	59.1
1984	0.34	27.1	0.09	30.8
1985	0.35	18.8	0.18	40.0
1986	0.33	48.4	0.24	64.5
1987	0.15	27.6	0.07	34.3
1988	0.16	28.0	0.09	23.4
1989	0.32	21.2	0.09	32.3
1990	0.37	39.0	0.11	51.9
1991	0.58	28.1	0.16	27.6
1992	0.49	17.8	0.10	15.4
1993	0.57	10.6	0.13	22.6
1994	1.16	69.6	0.49	82.1
1995	0.32	13.2	0.09	37.9
1996	0.43	14.3	0.07	17.7
1997	0.56	15.9	0.23	18.0
1998	0.28	26.0	0.10	22.9
1999	0.36	14.2	0.17	29.5
2000	0.37	18.7	0.13	26.9
2001	0.36	34.6	0.16	35.7
2002	0.33	19.6	0.11	23.9
2003	0.28	22.5	0.05	24.9
2004	0.24	33.6	0.06	40.5
2005	0.13	32.8	0.06	74.1
2006	0.61	12.7	0.03	15.0
2007	0.59	28.7	0.11	36.5
2008	0.38	25.1	0.10	33.3
2009	0.47	18.1	0.13	25.7
2010	0.28	25.6	0.07	24.2
2011	0.59	32.9	0.13	27.1

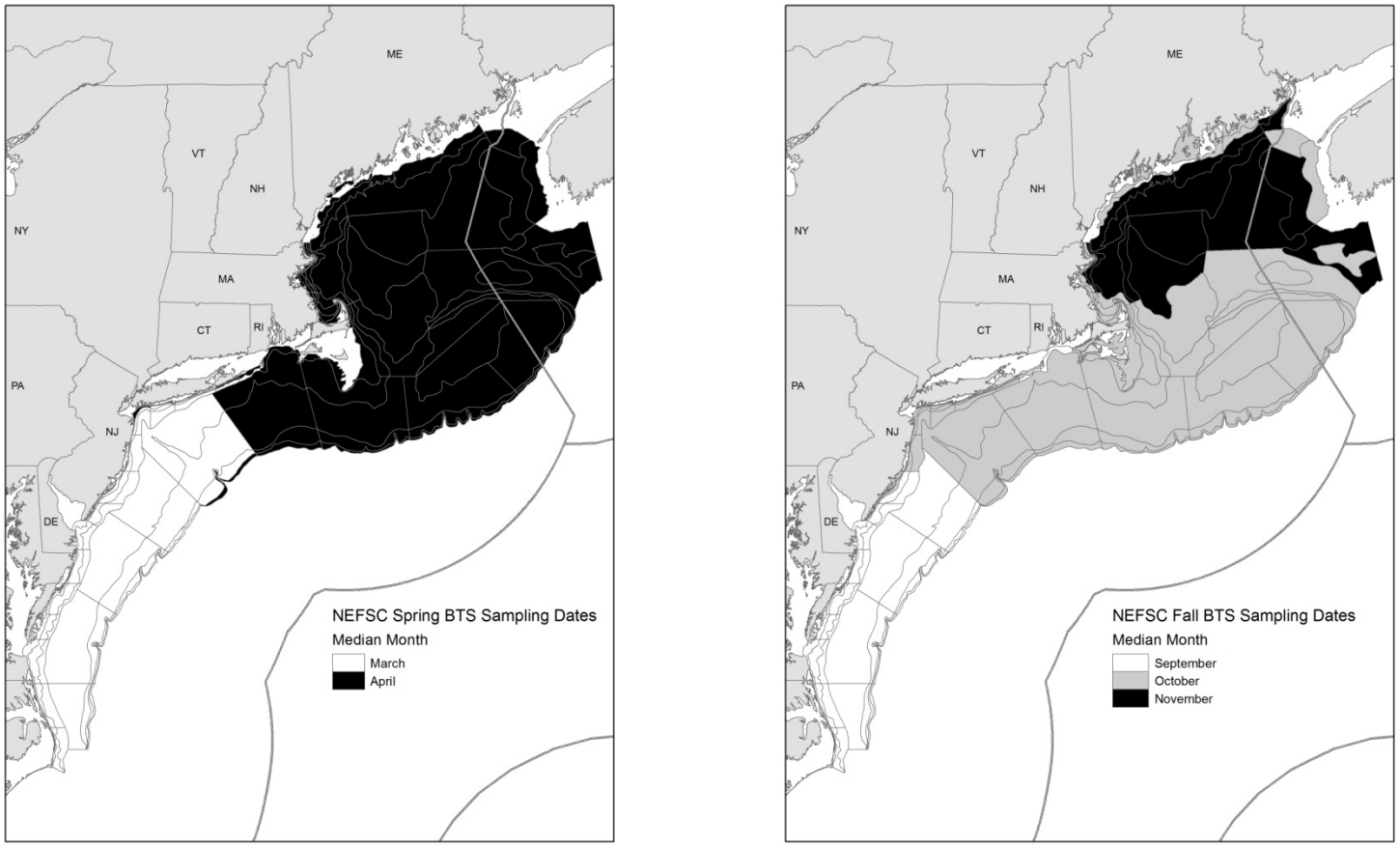


Figure 1. Median month during which the inshore and offshore depth strata were sampled during Northeast Fisheries Science Center spring and fall bottom trawl surveys, 1976-2010.

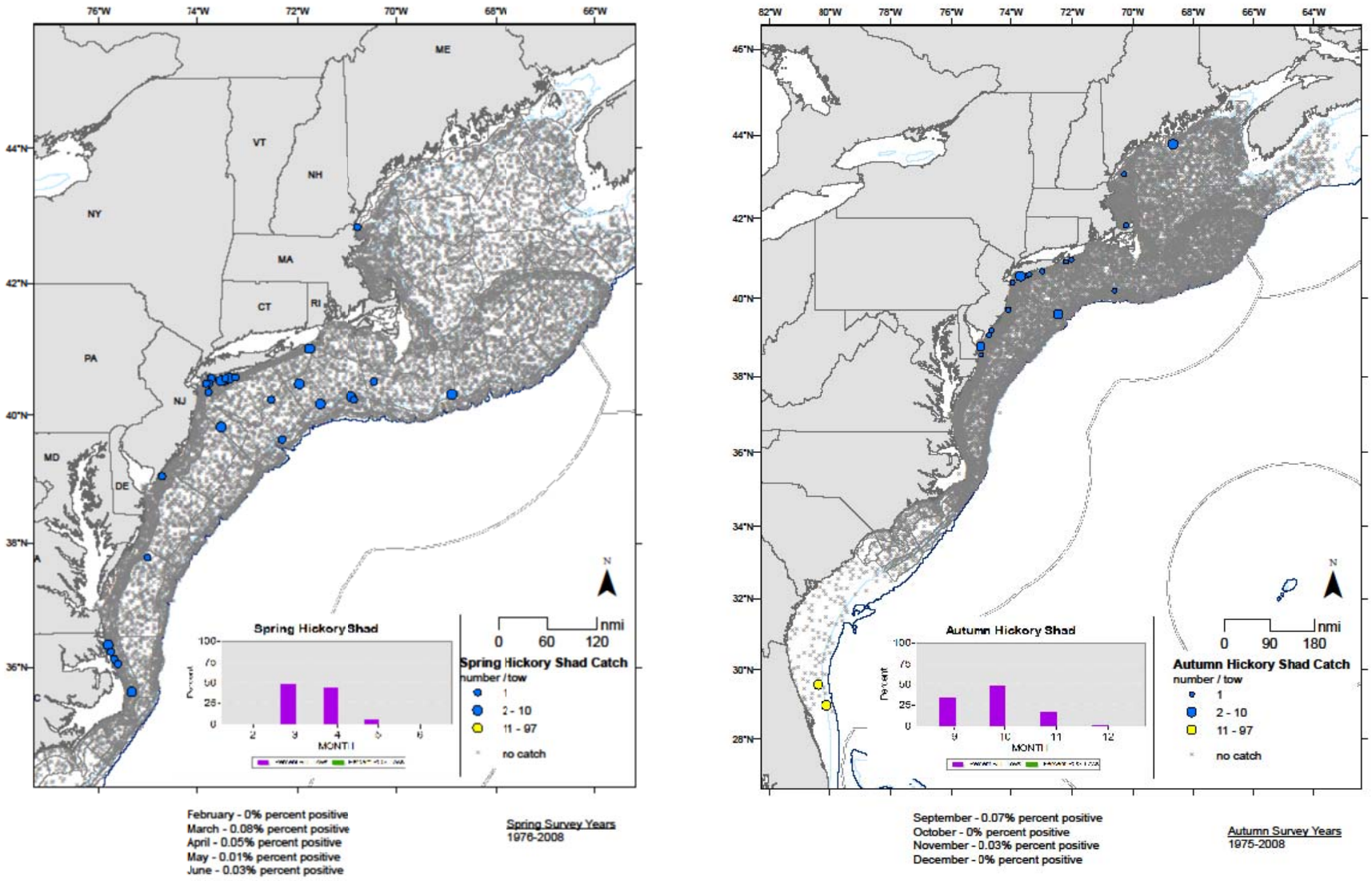


Figure 2. Distribution of hickory shad during NEFSC spring (1976-2008, left panel) and fall (1985-2008, right panel) bottom trawls surveys.

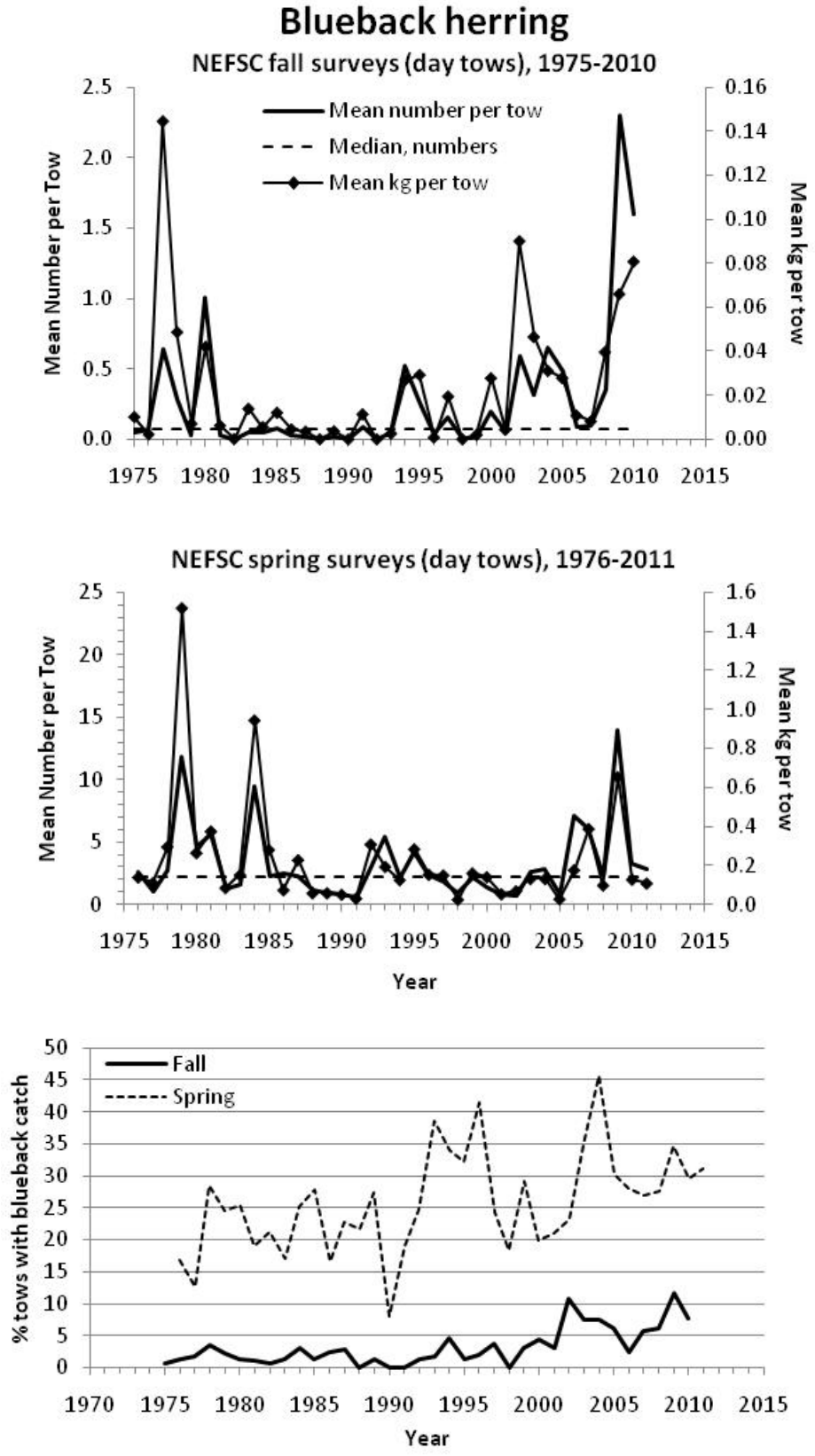


Figure 3. Blueback herring relative abundance (mean number per tow) and biomass (mean kg per tow) indices and percent positive tows for NEFSC fall (1975-2010) and spring (1976-2011) bottom trawl surveys.

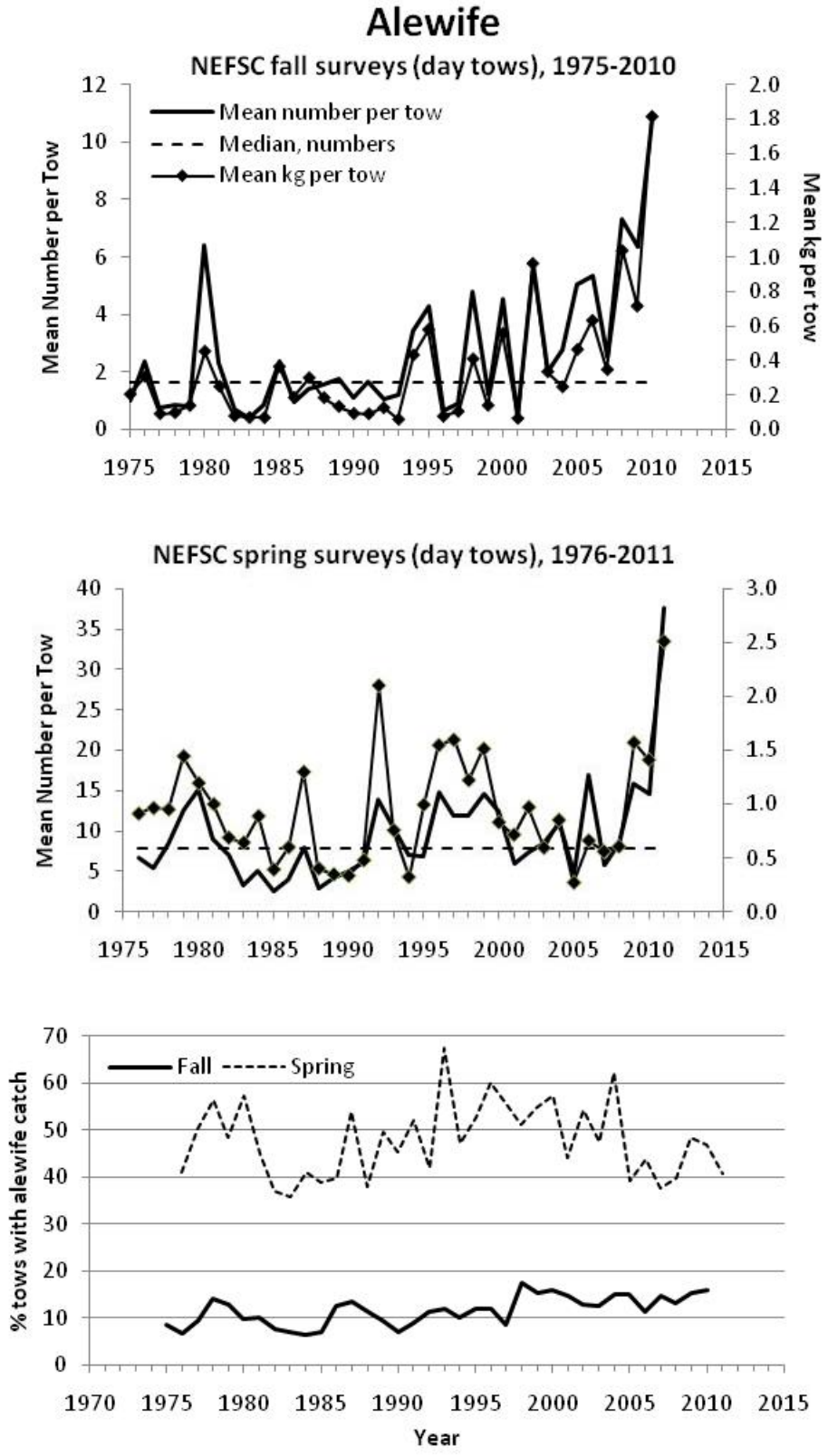


Figure 4. Alewife relative abundance (mean number per tow) and biomass (mean kg per tow) indices and percent positive tows for NEFSC fall (1975-2010) and spring (1976-2011) bottom trawl surveys.

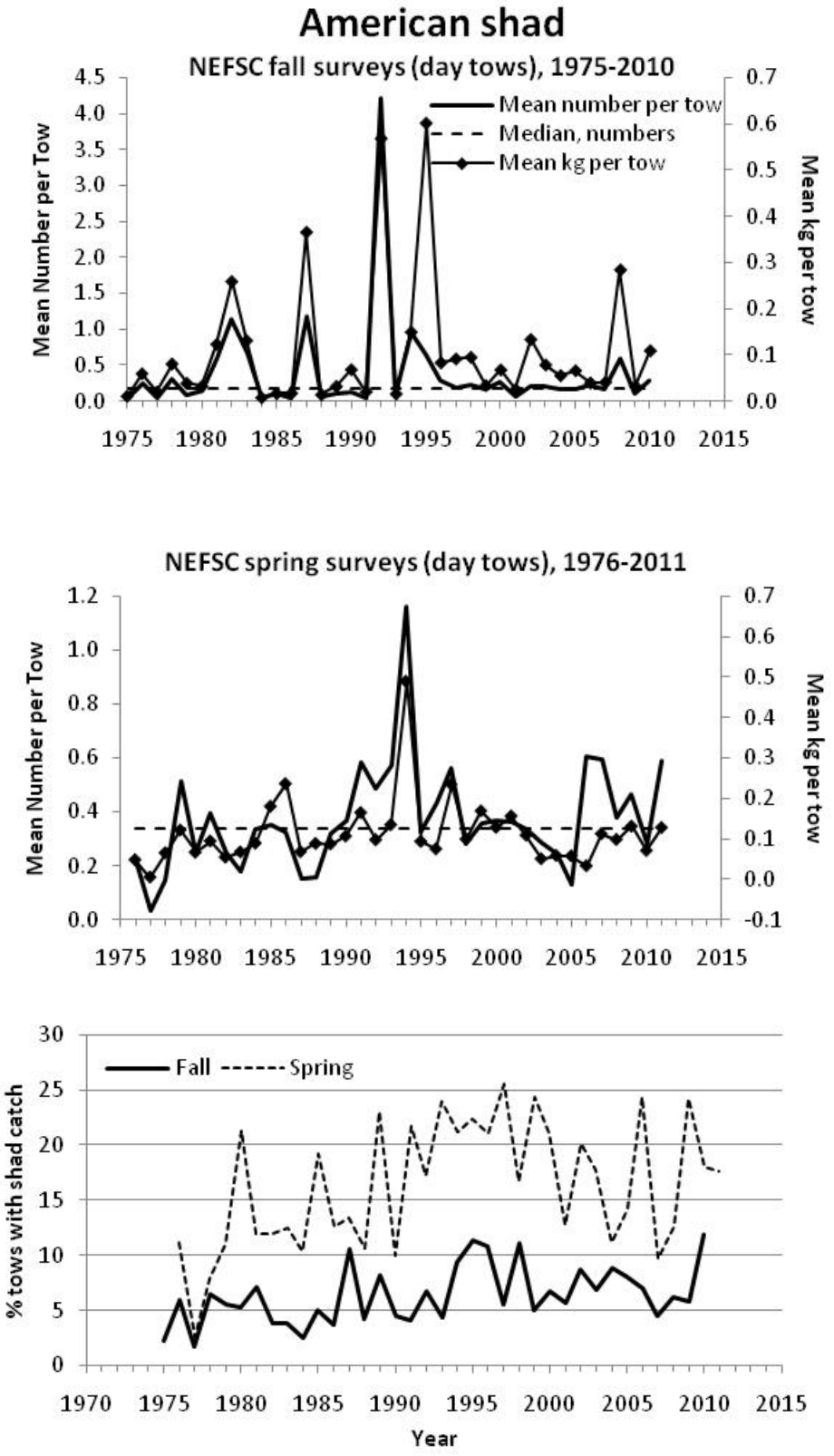


Figure 5. American shad relative abundance (mean number per tow) and biomass (mean kg per tow) indices and percent positive tows for NEFSC fall (1975-2010) and spring (1976-2011) bottom trawl surveys.

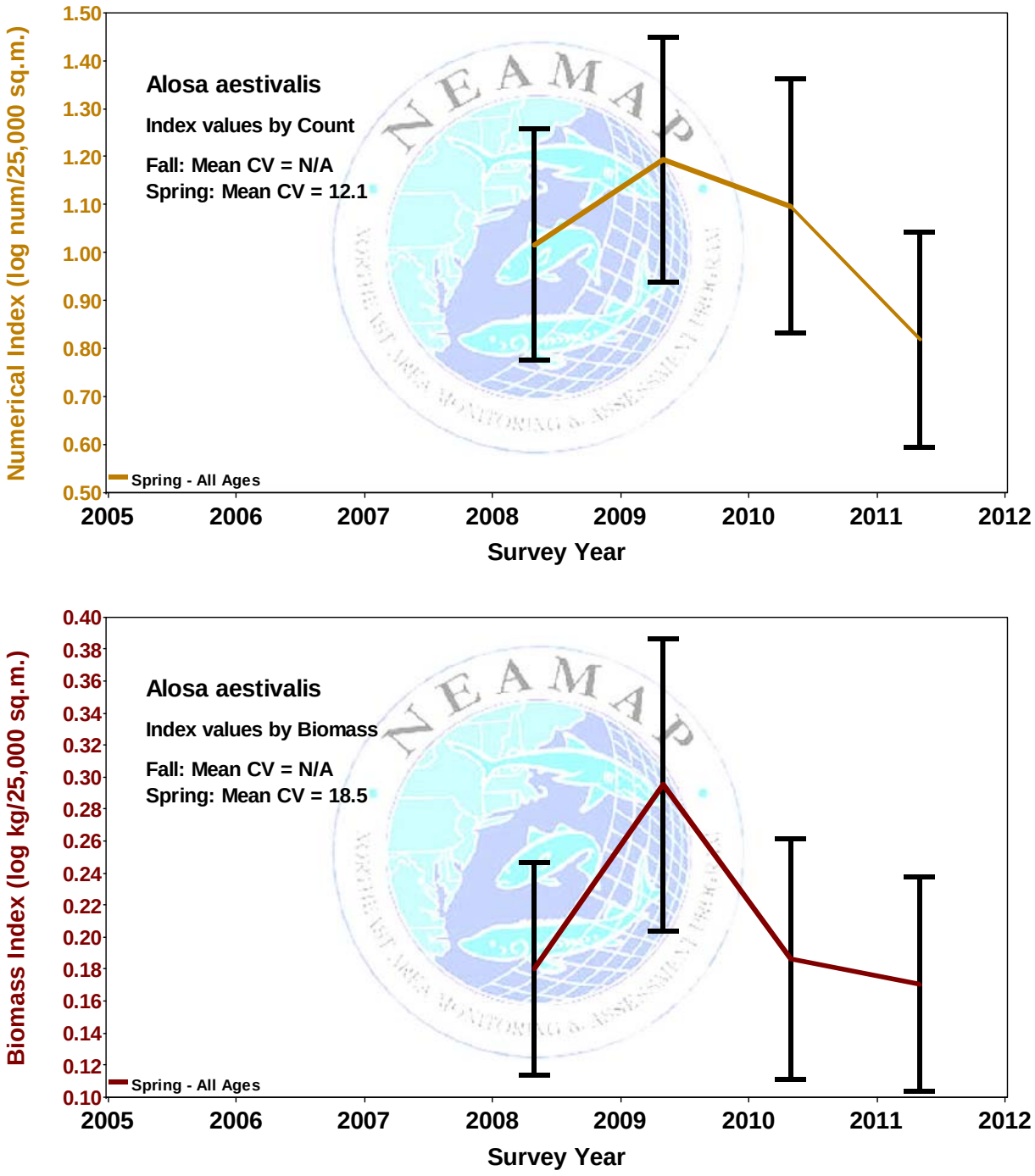


Figure 6. Swept area abundance (log number per 25,000 m^2) and biomass (log kg per 25,000 m^2) estimates of blueback herring derived from the spring (2008-2011) NEAMAP bottom trawl surveys.

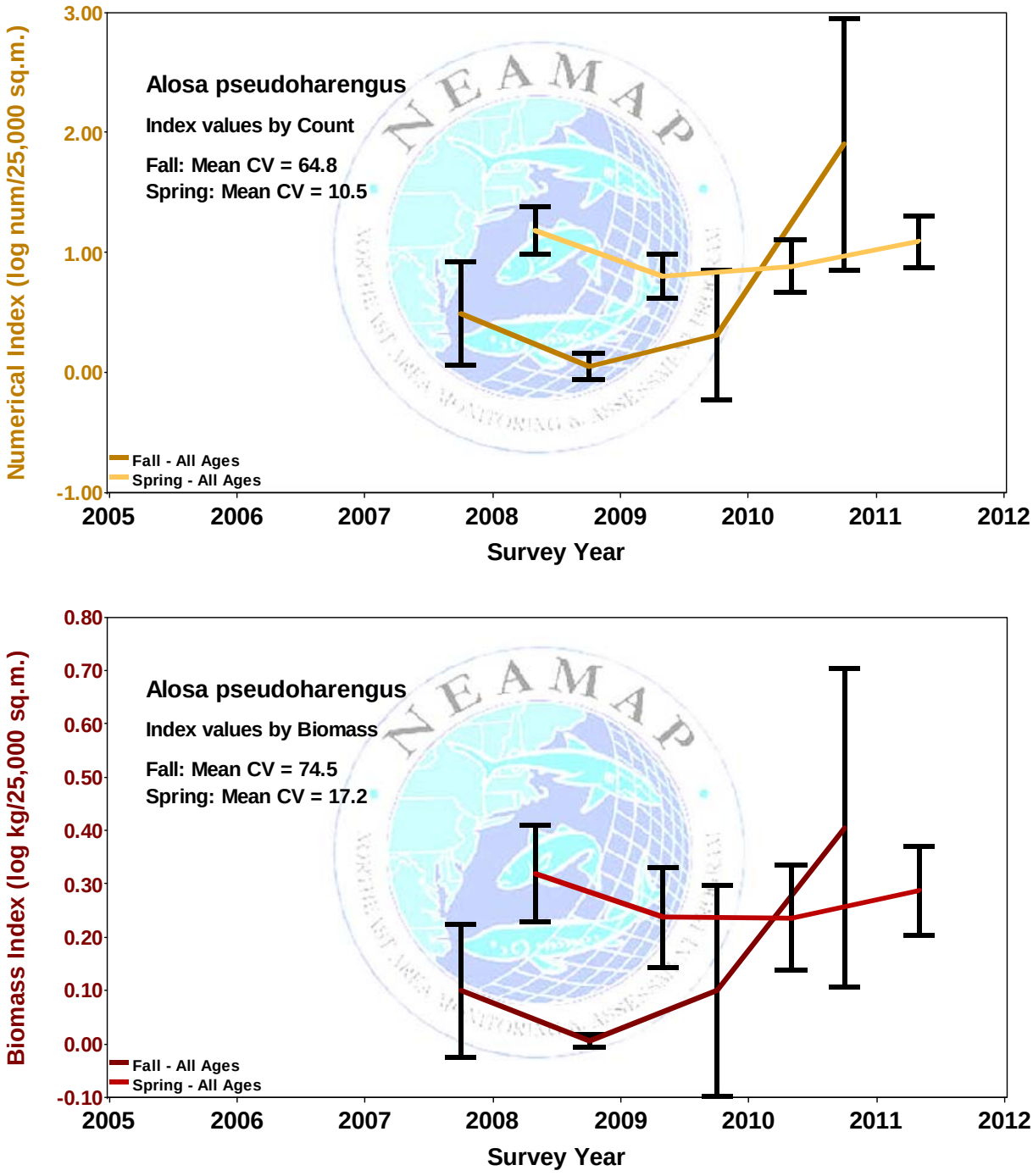


Figure 7. Swept area abundance (log number per 25,000 m^2) and biomass (log kg per 25,000 m^2) estimates of alewife derived from the fall (2007-2010) and spring (2008-2011) NEAMAP bottom trawl surveys.

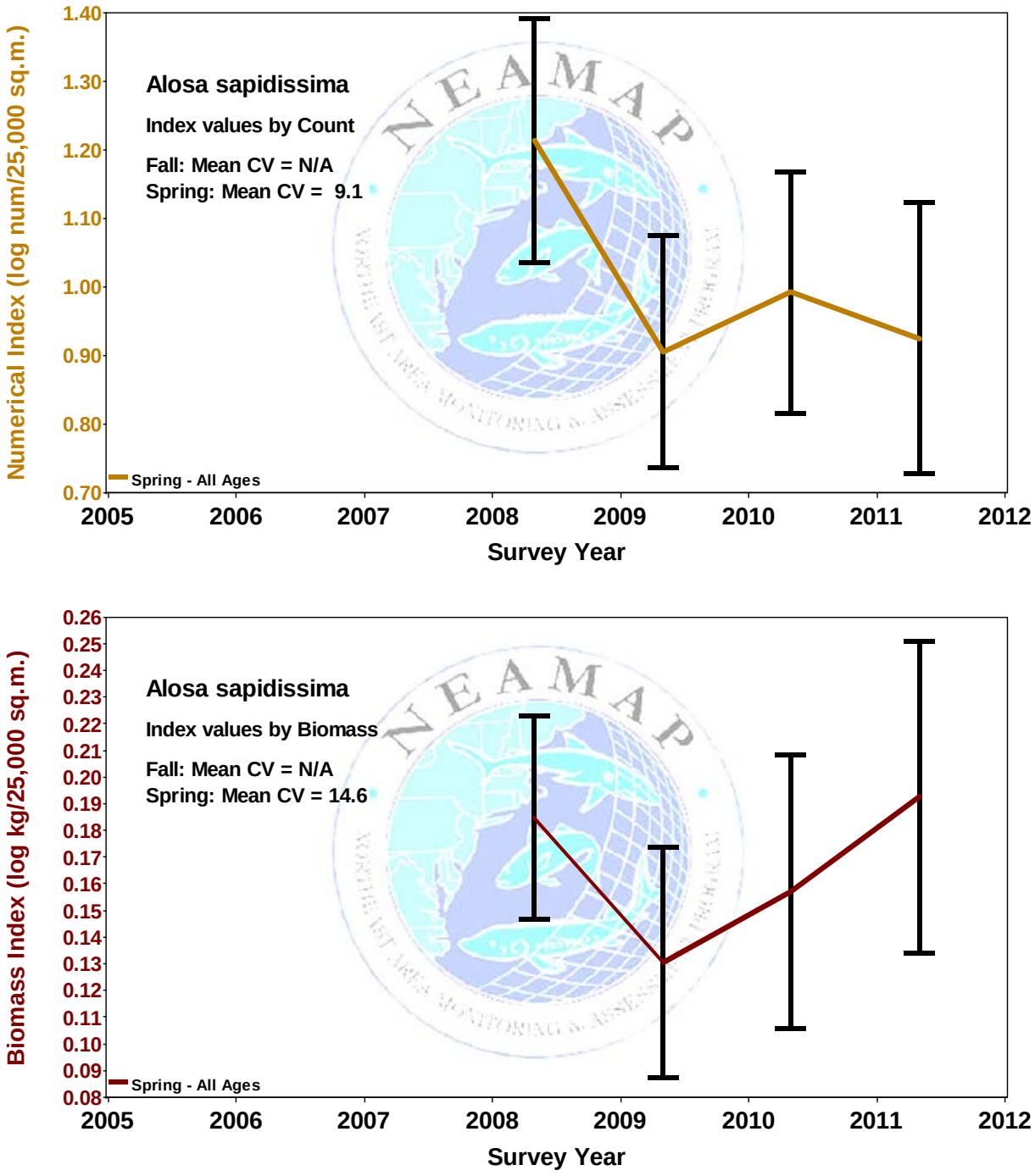


Figure 8. Swept area abundance (log number per 25,000 m^2) and biomass (log kg per 25,000 m^2) estimates of American shad derived from the spring (2008-2011) NEAMAP bottom trawl surveys.

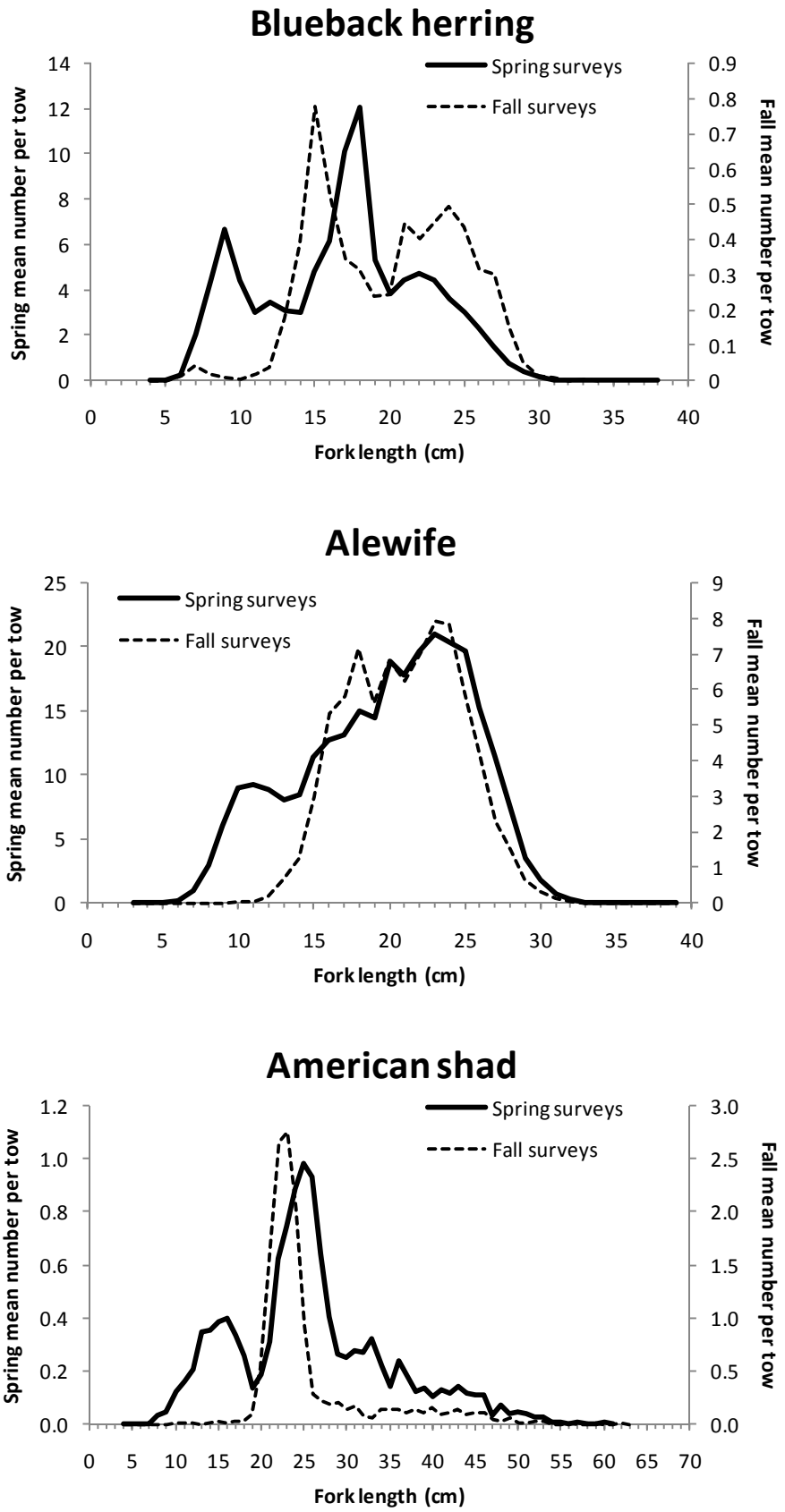


Figure 9. Length compositions (stratified mean numbers per tow) of blueback herring, alewife, and American shad caught during NEFSC spring and fall bottom trawl surveys, 1976-2008.

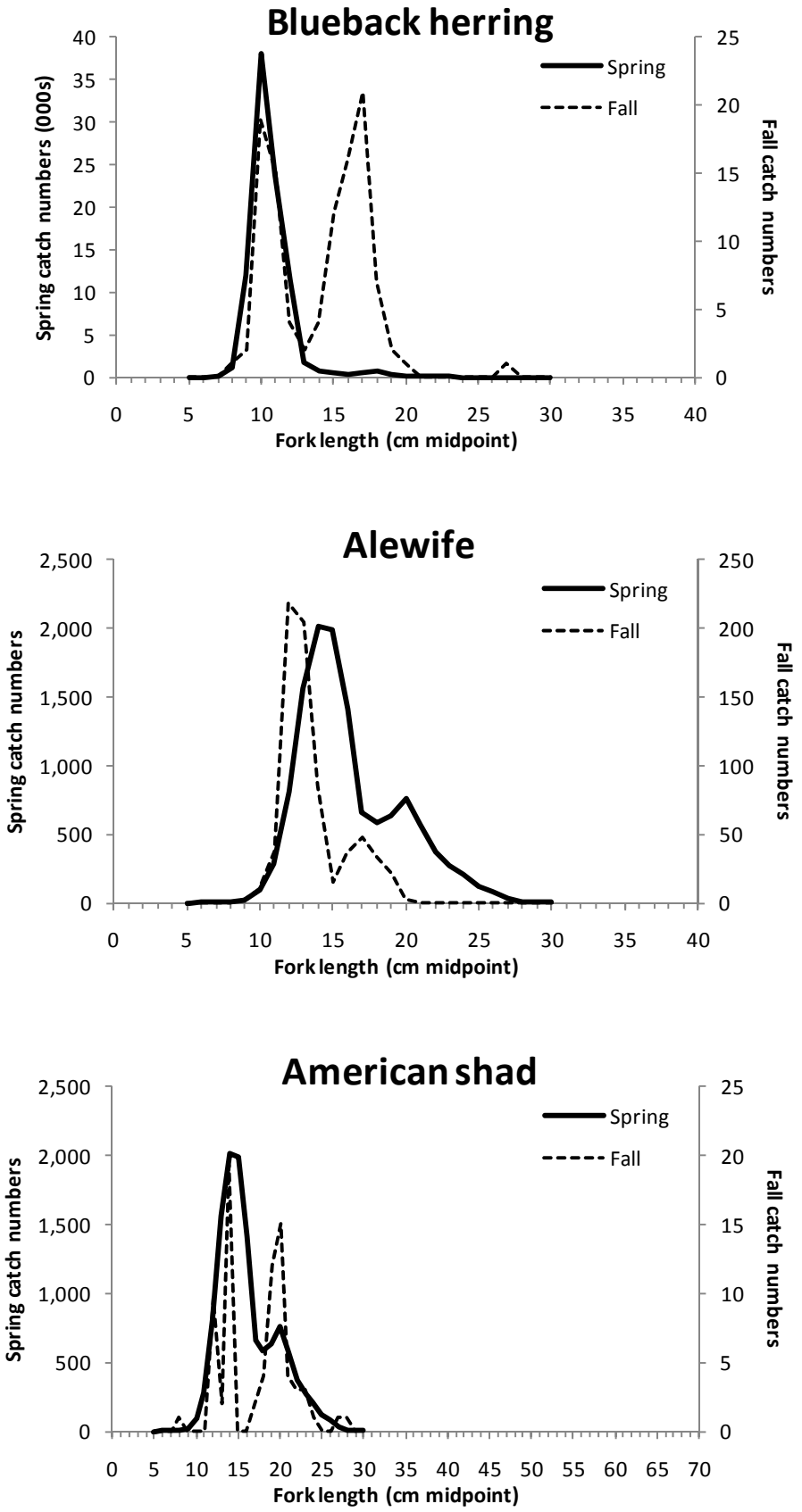


Figure 10. Length compositions (stratified mean numbers per tow) of blueback herring, alewife, and American shad caught during NEAMAP spring (2008-2011) and fall (2007-2010) bottom trawl surveys

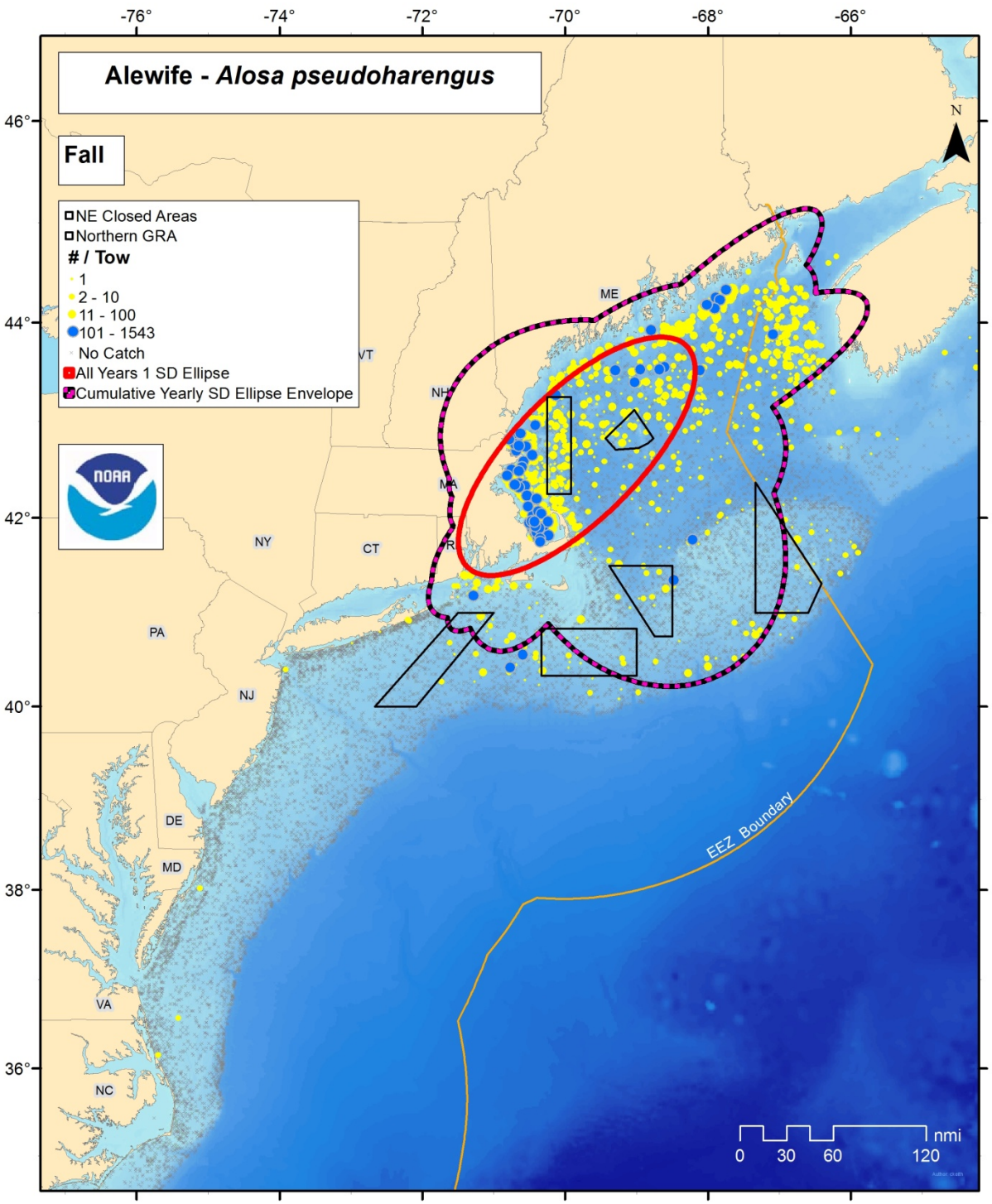


Figure 11. The standard deviational ellipse (one standard deviation) for *Alosa pseudoharengus* catches (numbers per tow) in fall NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1975-2010 (red ellipse), and the "envelope" which encompasses all of the annual standard deviational ellipses for the same time period.

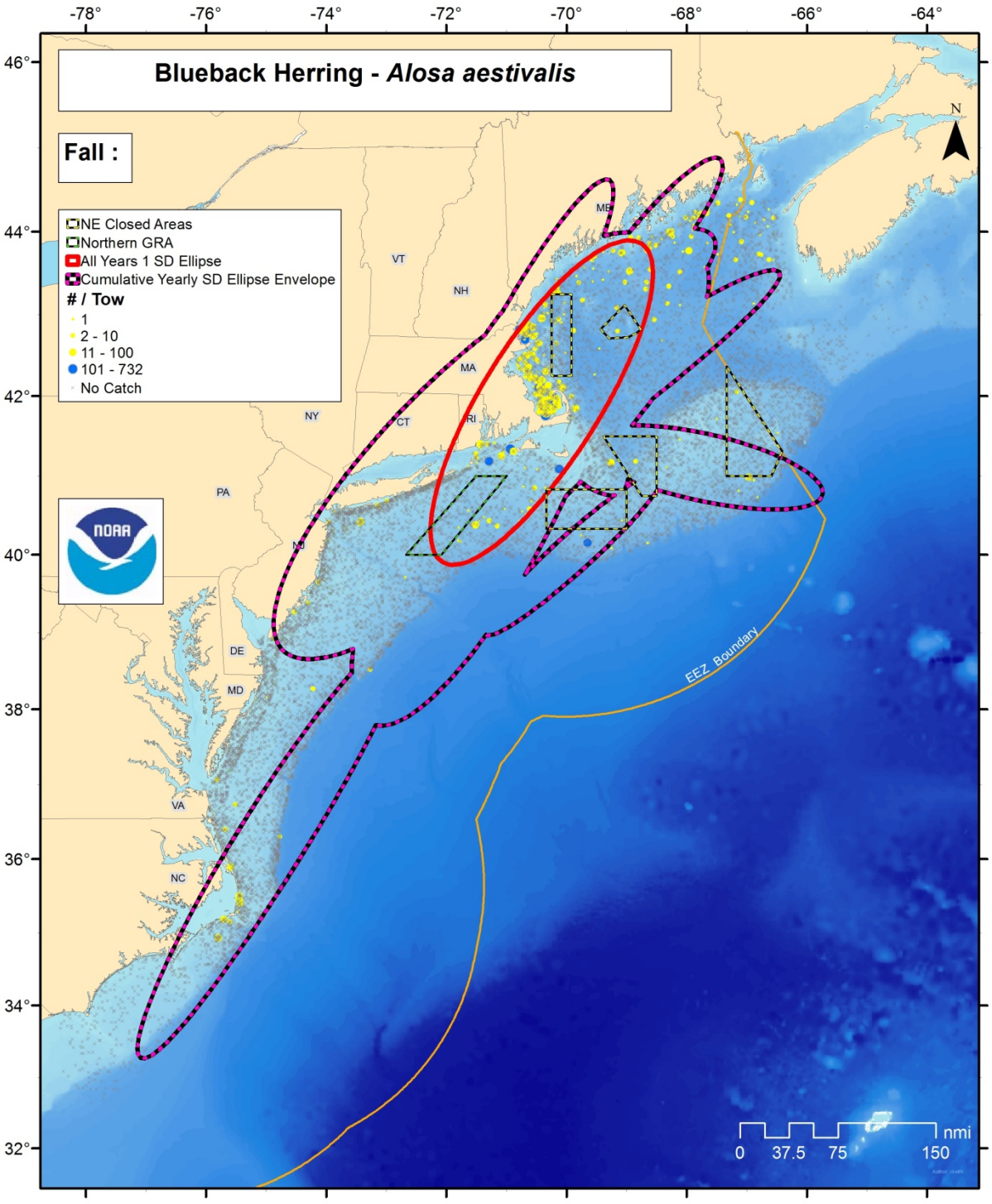


Figure 12. The standard deviational ellipse (one standard deviation) for *Alosa aestivalis* catches (numbers per tow) in fall NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1975-2010 (red ellipse), and the "envelope" which encompasses all of the annual standard deviational ellipses for the same time period.

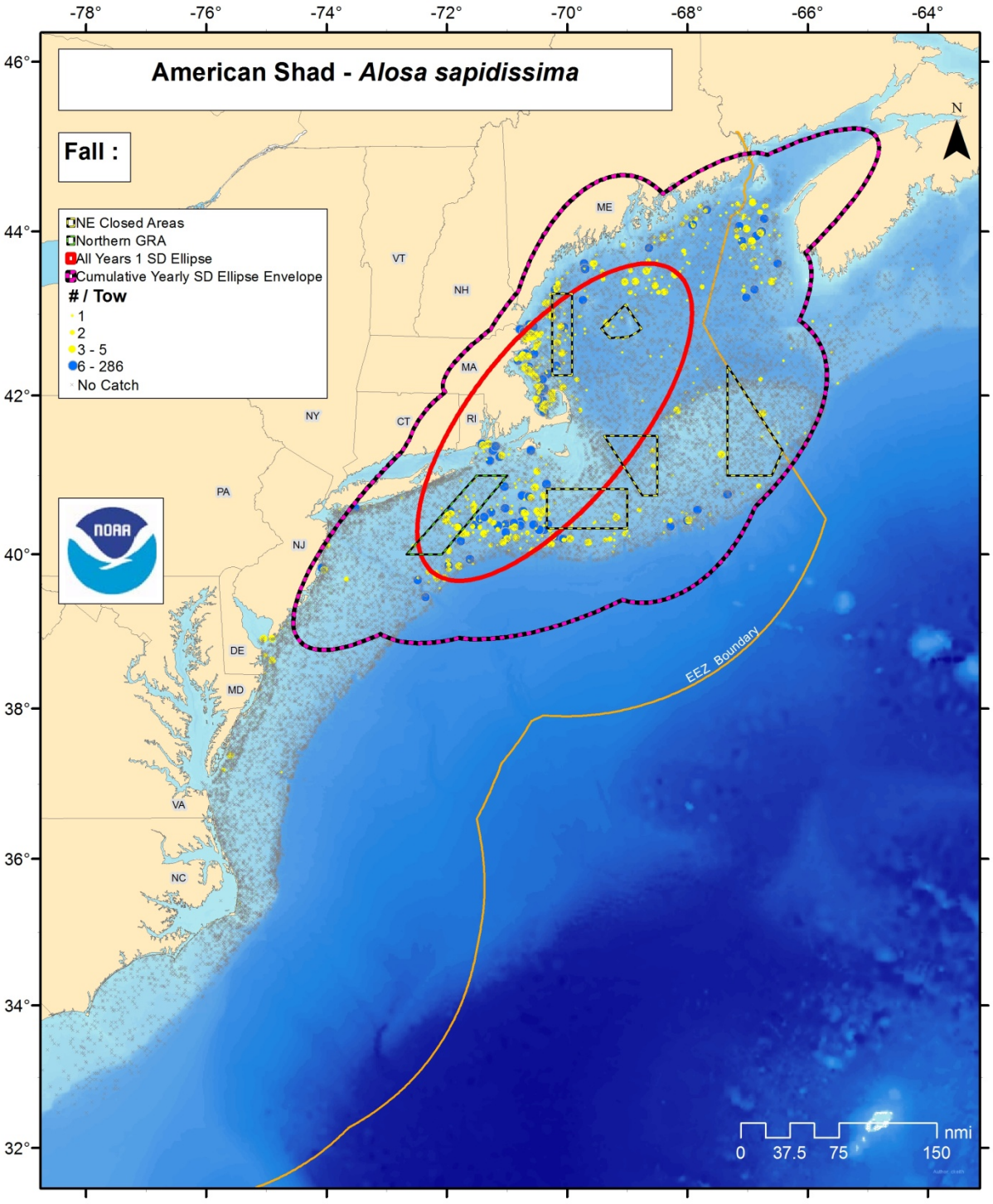


Figure 13. The standard deviational ellipse (one standard deviation) for *Alosa sapidissima* catches (numbers per tow) in fall NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1975-2010 (red ellipse), and the "envelope" which encompasses all of the annual standard deviational ellipses for the same time period.

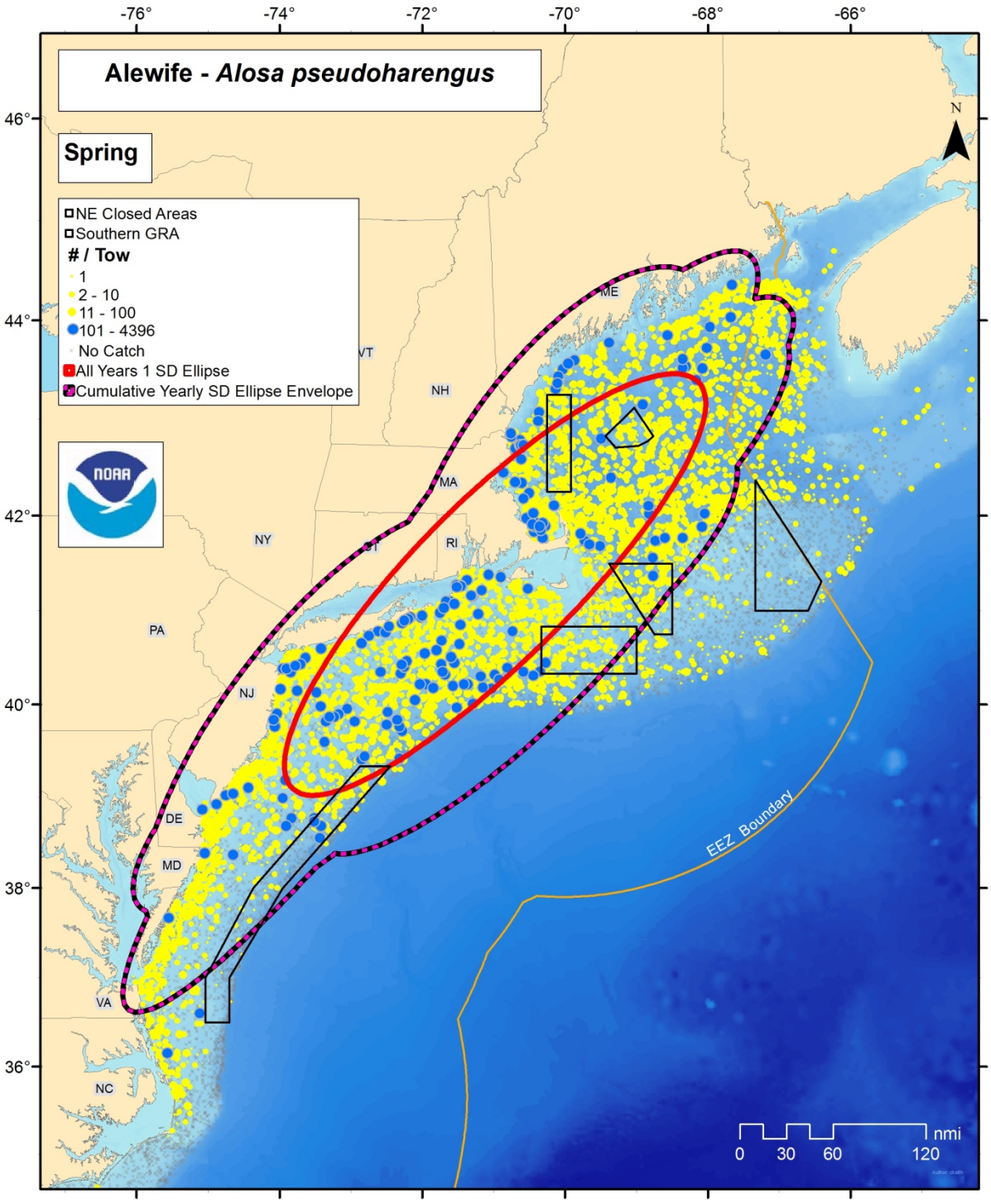


Figure 14. The standard deviational ellipse (one standard deviation) for *Alosa pseudoharengus* catches (numbers per tow) in spring NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1976-2010 (red ellipse), and the "envelope" which encompasses all of the annual standard deviational ellipses for the same time period.

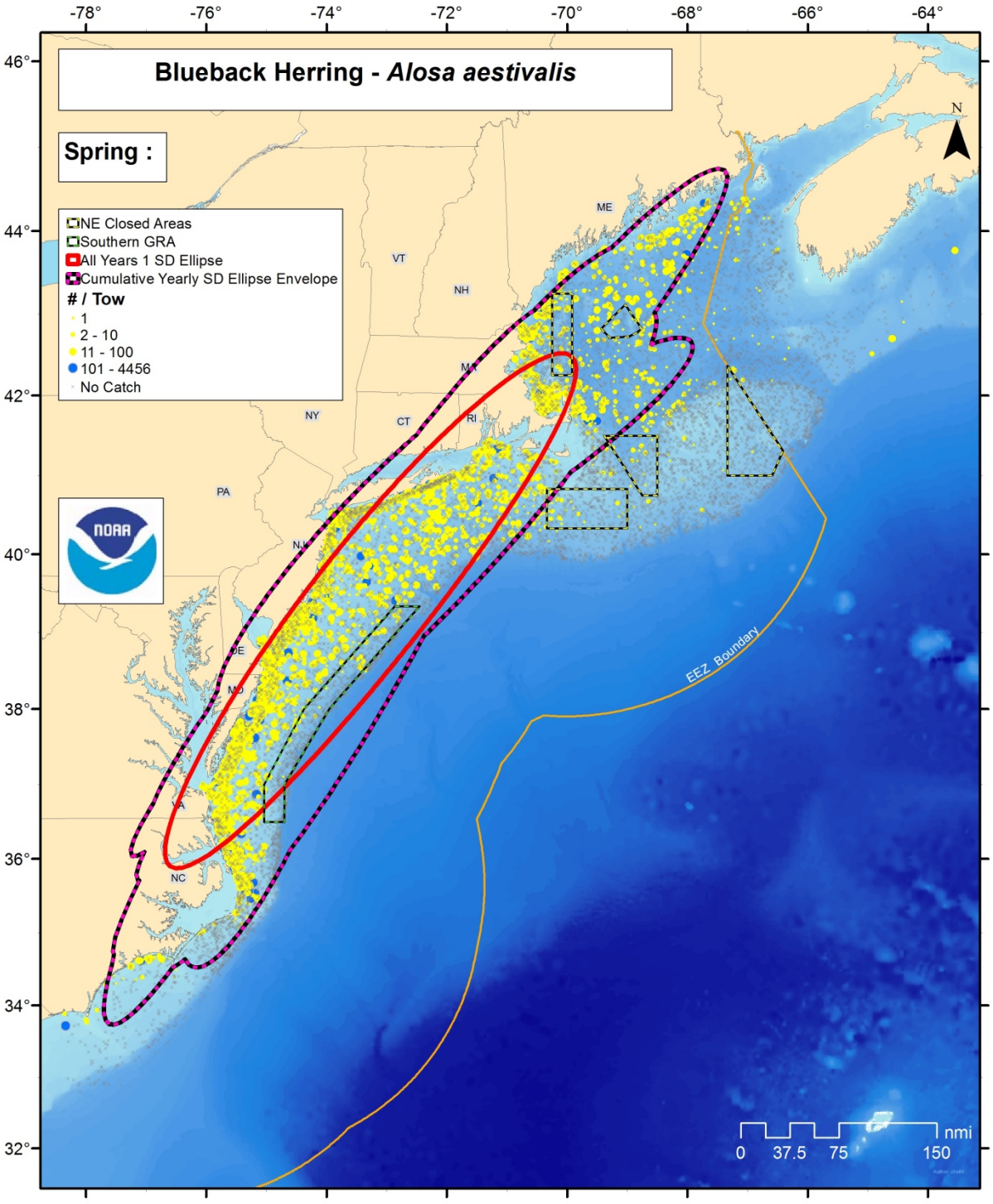


Figure 15. The standard deviational ellipse (one standard deviation) for *Alosa aestivalis* catches (numbers per tow) in spring NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1976-2010 (red ellipse), and the "envelope" which encompasses all of the annual standard deviational ellipses for the same time period.

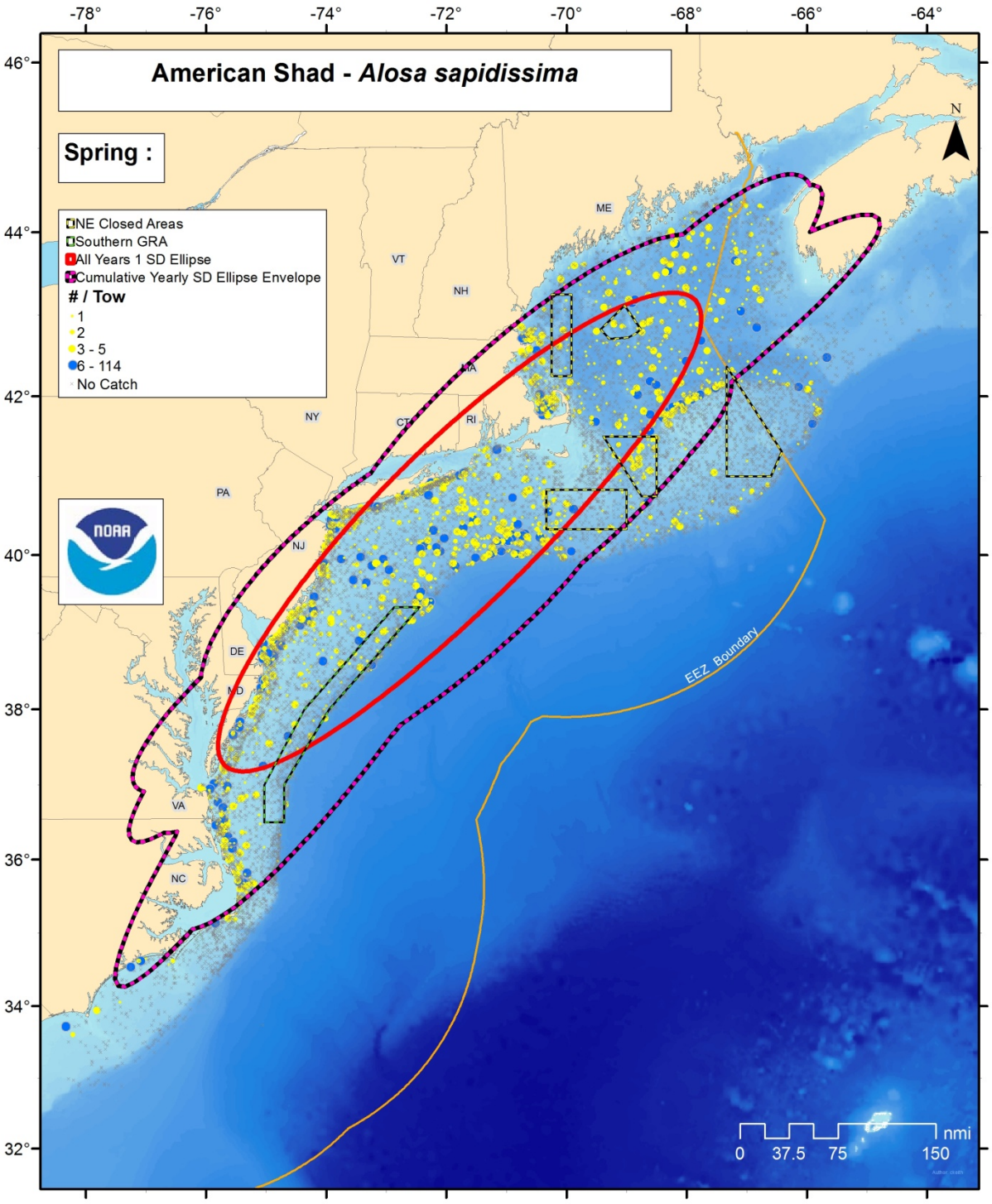


Figure 16. The standard deviational ellipse (one standard deviation) for *Alosa sapidissima* catches (numbers per tow) in spring NEFSC and NEAMAP bottom trawl surveys, for all years combined during 1976-2010 (red ellipse), and the "envelope" which encompasses all of the annual ellipses for the same time period.

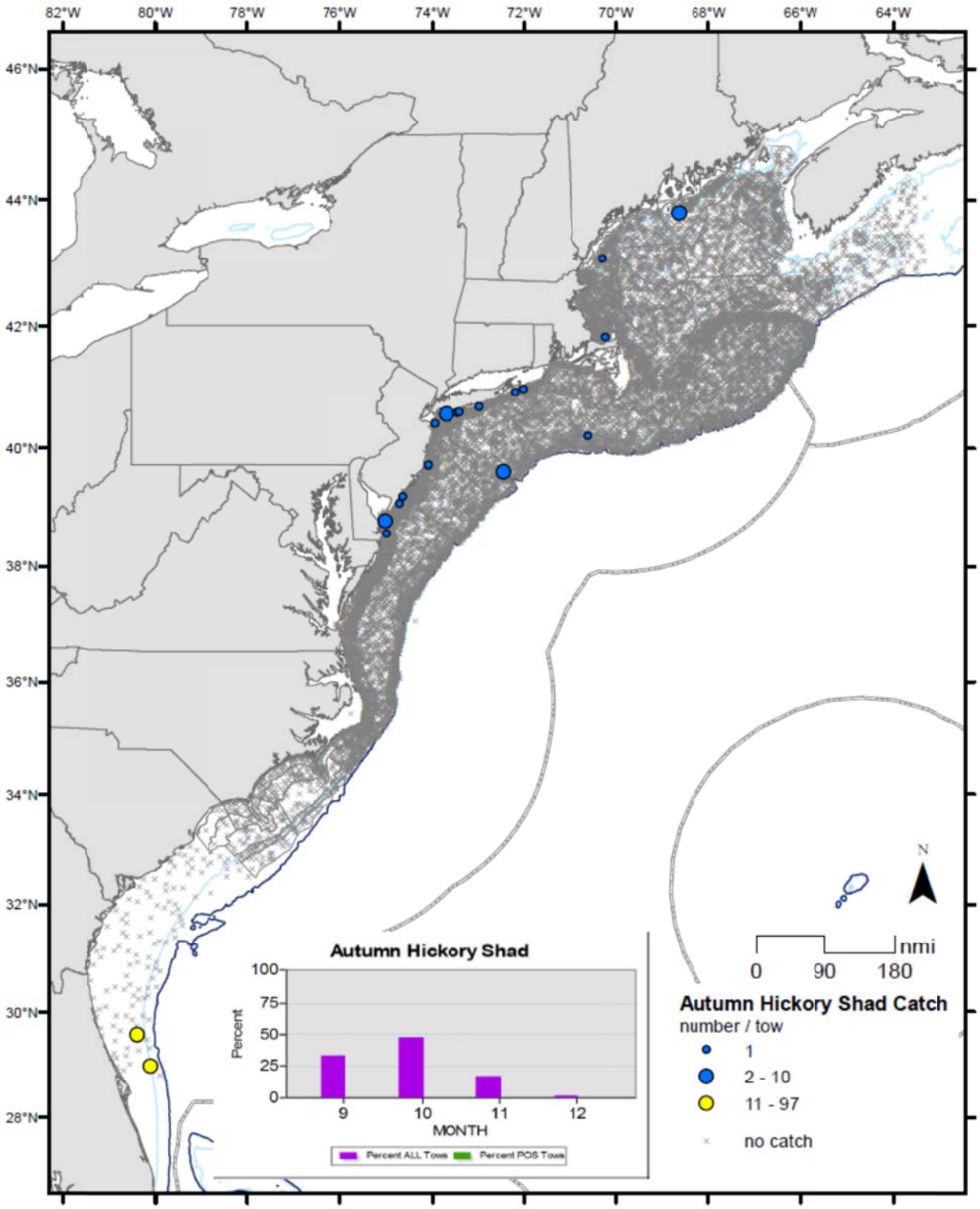


Figure 17. Distribution of *Alosa mediocris* (numbers per tow) during NEFSC and NEAMAP fall surveys, 1975-2010.

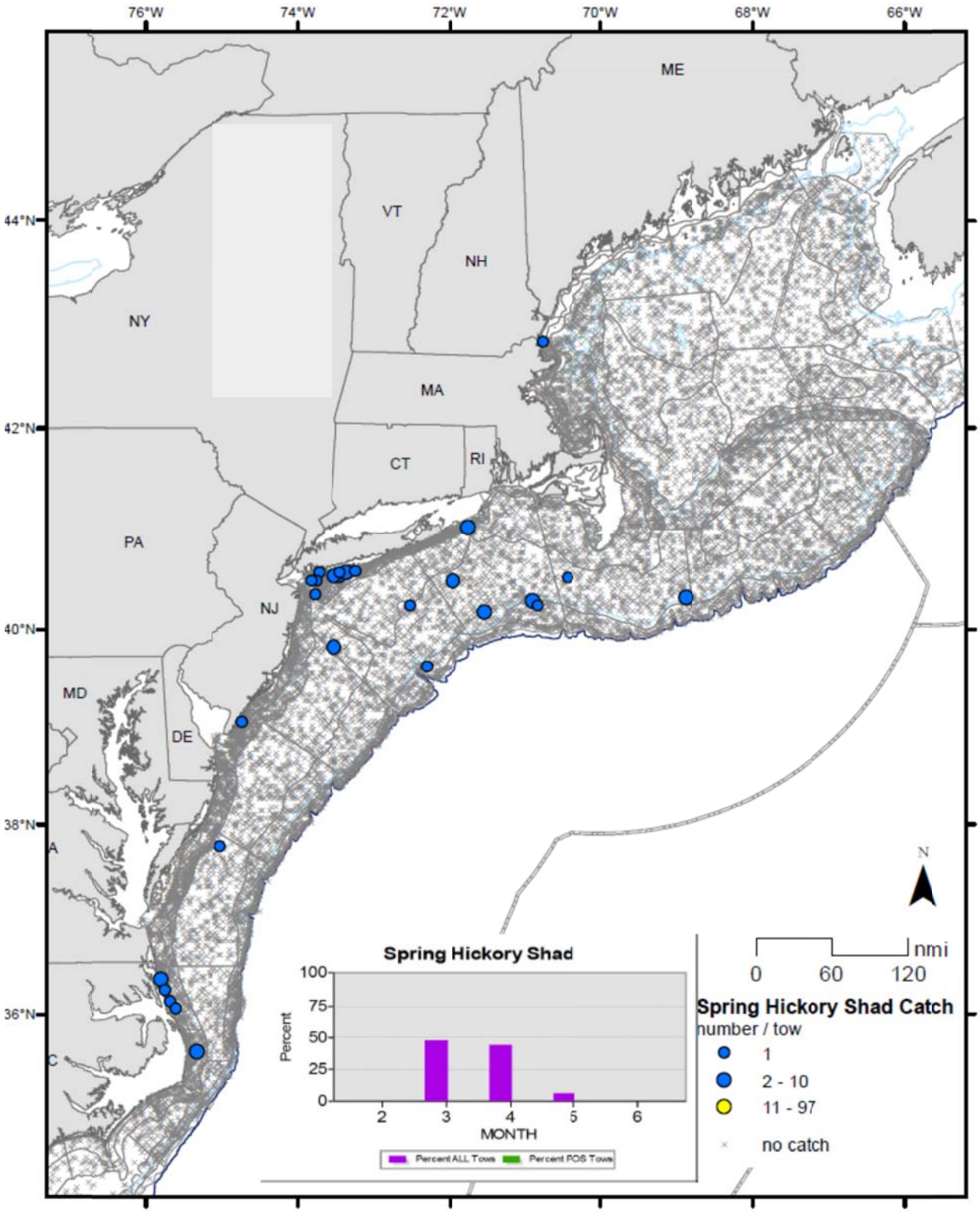


Figure 18. Distribution of *Alosa mediocris* (numbers per tow) during NEFSC and NEAMAP spring surveys, 1976-2010.

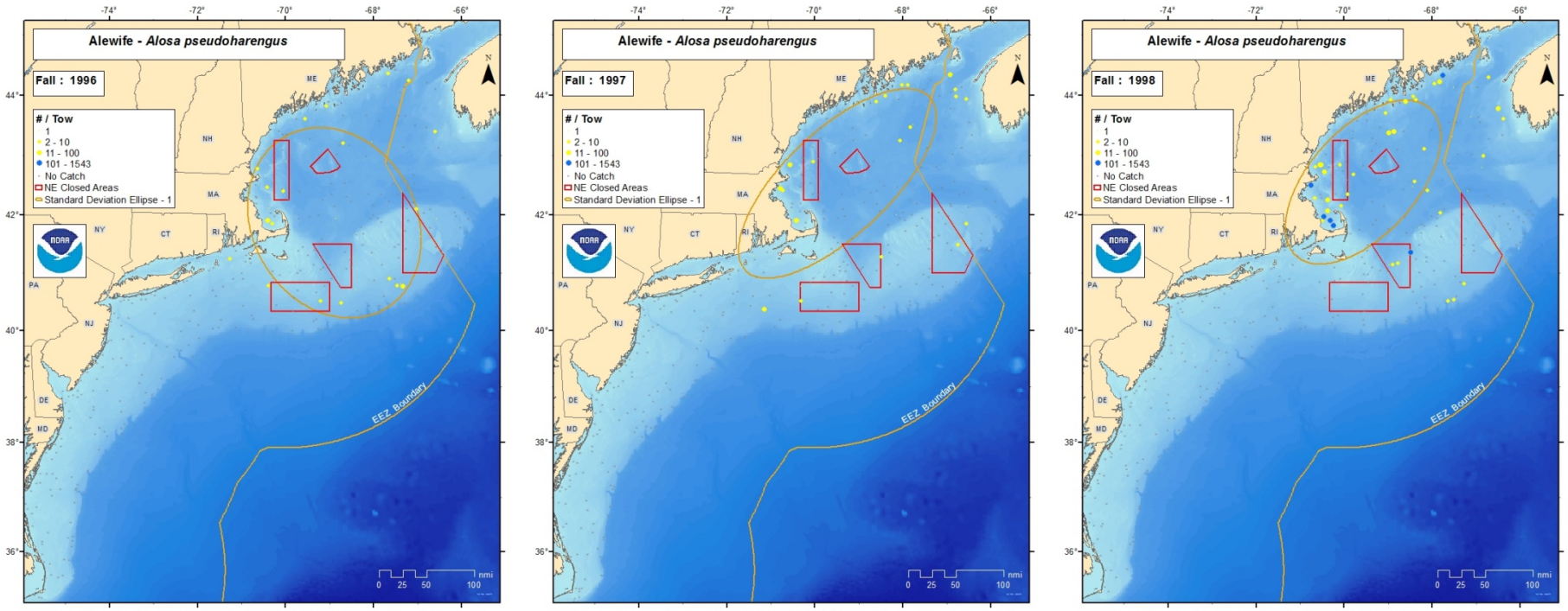


Figure 19. Annual standard deviational ellipses (one standard deviation) for *Alosa pseudoharengus* catches (numbers per tow) during the 1996-1998 NEFSC fall bottom trawl surveys.

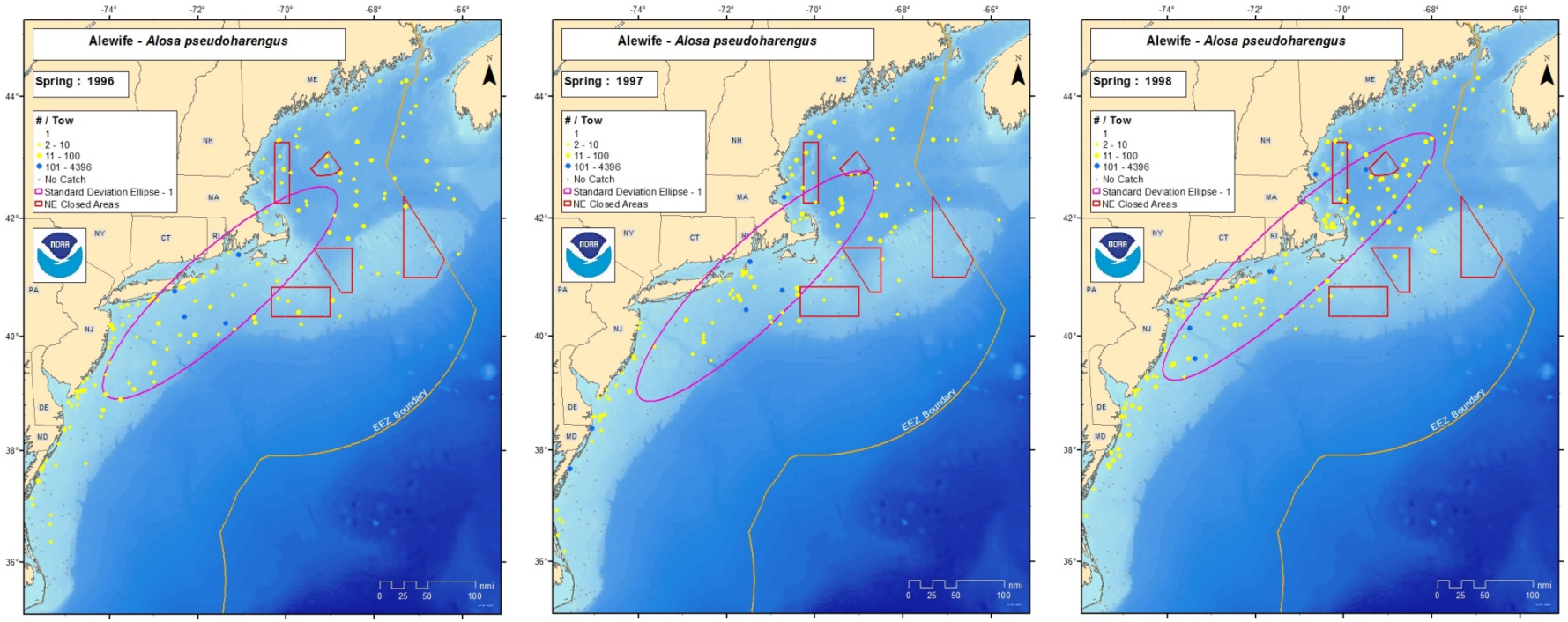


Figure 20. Annual standard deviational ellipses (one standard deviation) for *Alosa pseudoharengus* catches (numbers per tow) during the 1996-1998 NEFSC spring bottom trawl surveys.

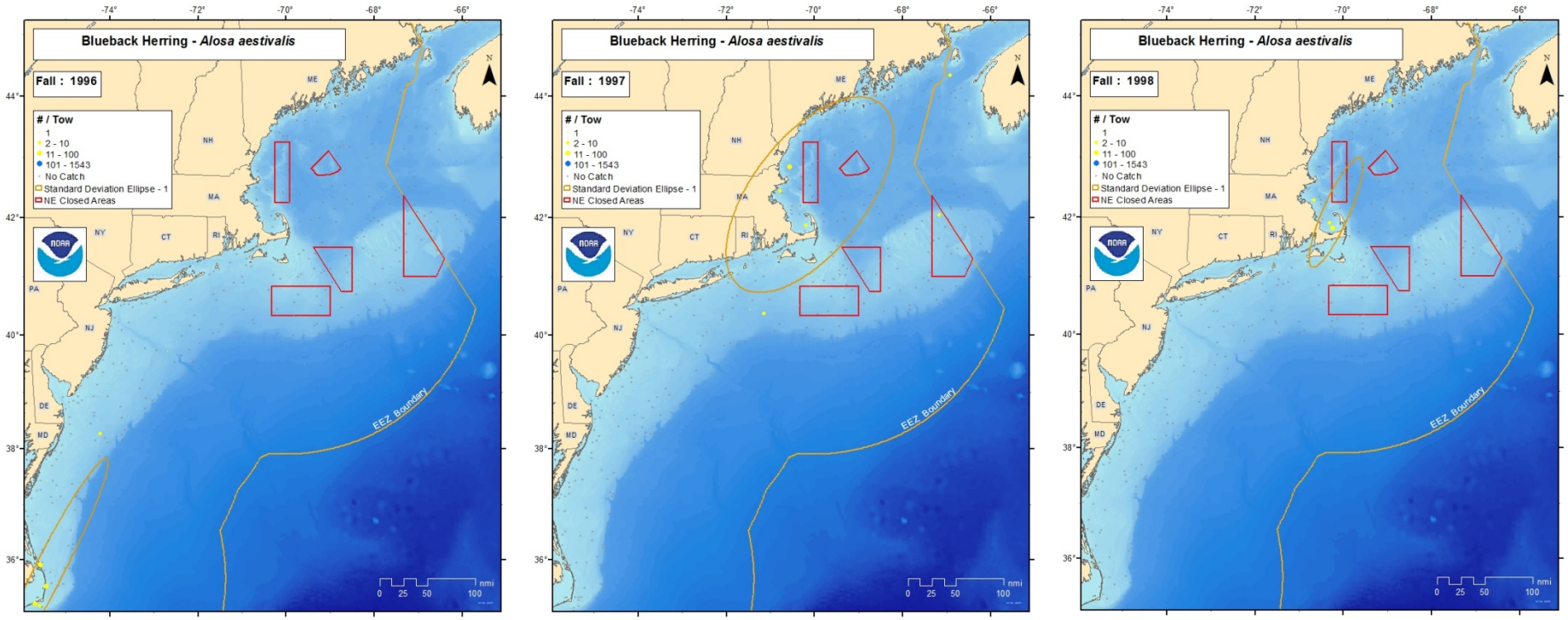


Figure 21. Annual standard deviational ellipses (one standard deviation) for *Alosa aestivalis* catches (numbers per tow) during the 1996-1998 NEFSC fall bottom trawl surveys.

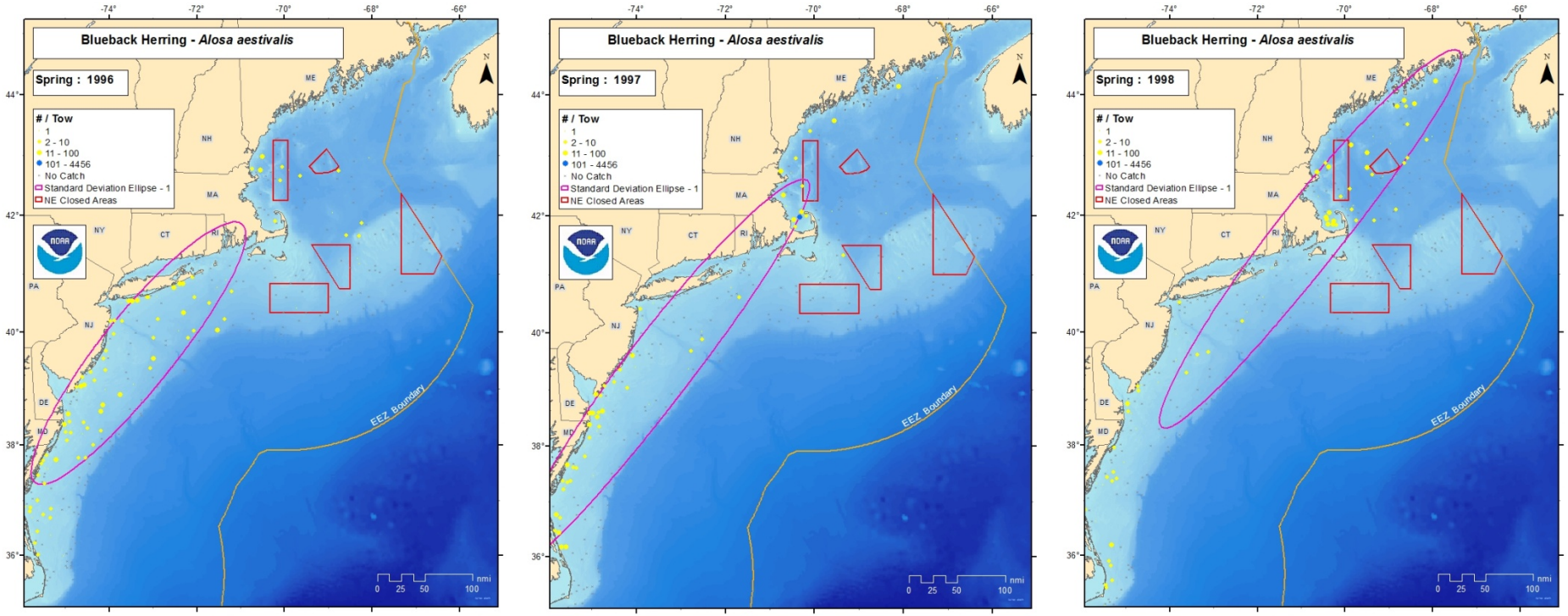


Figure 22. Annual standard deviational ellipses (one standard deviation) for *Alosa aestivalis* catches (numbers per tow) during the 1996-1998 NEFSC spring bottom trawl surveys.

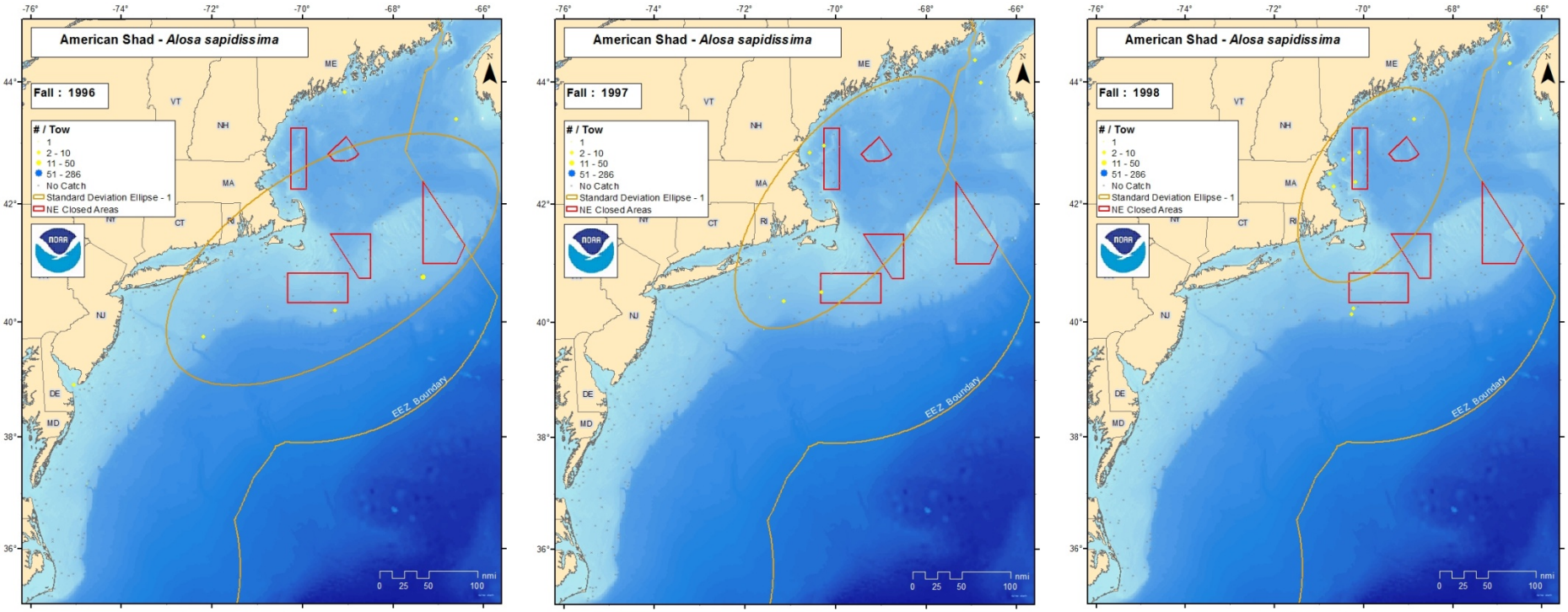


Figure 23. Annual standard deviational ellipses (one standard deviation) for *Alosa sapidissima* catches (numbers per tow) during the 1996-1998 NEFSC fall bottom trawl surveys.

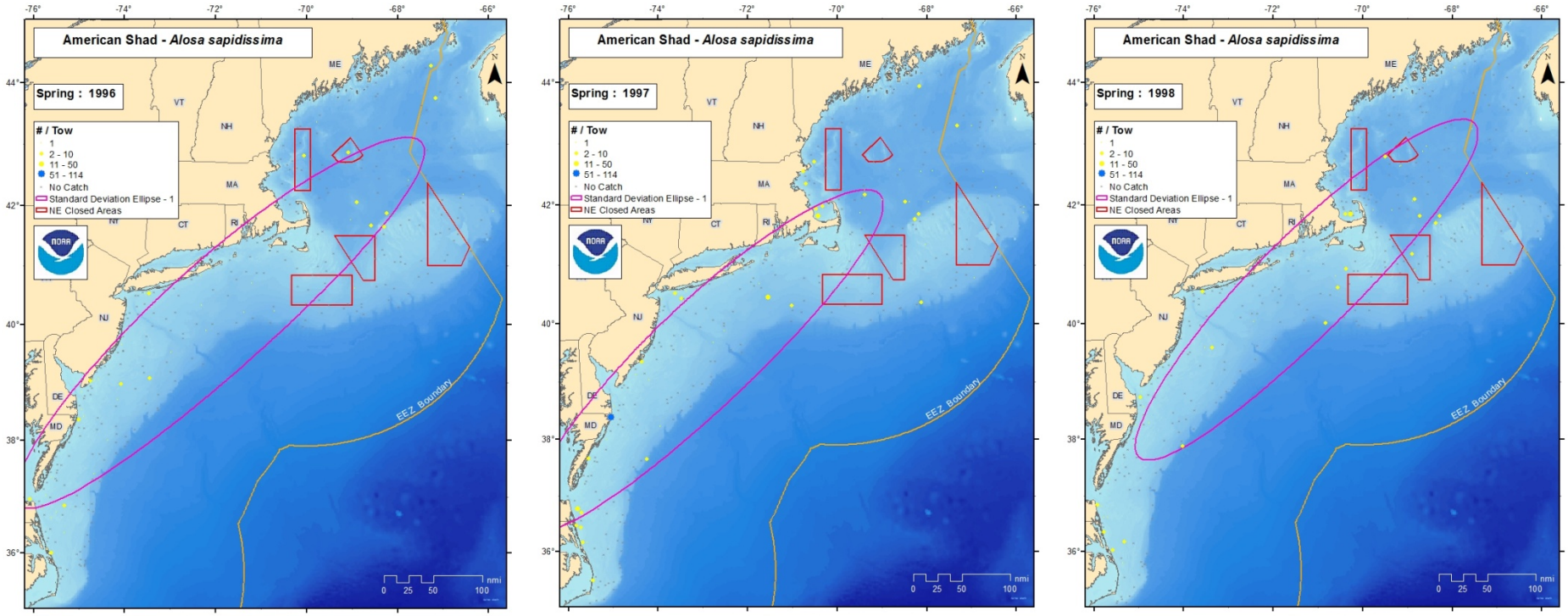


Figure 24. Annual standard deviational ellipses (one standard deviation) for *Alosa sapidissima* catches (numbers per tow) during the 1996-1998 NEFSC spring bottom trawl surveys.

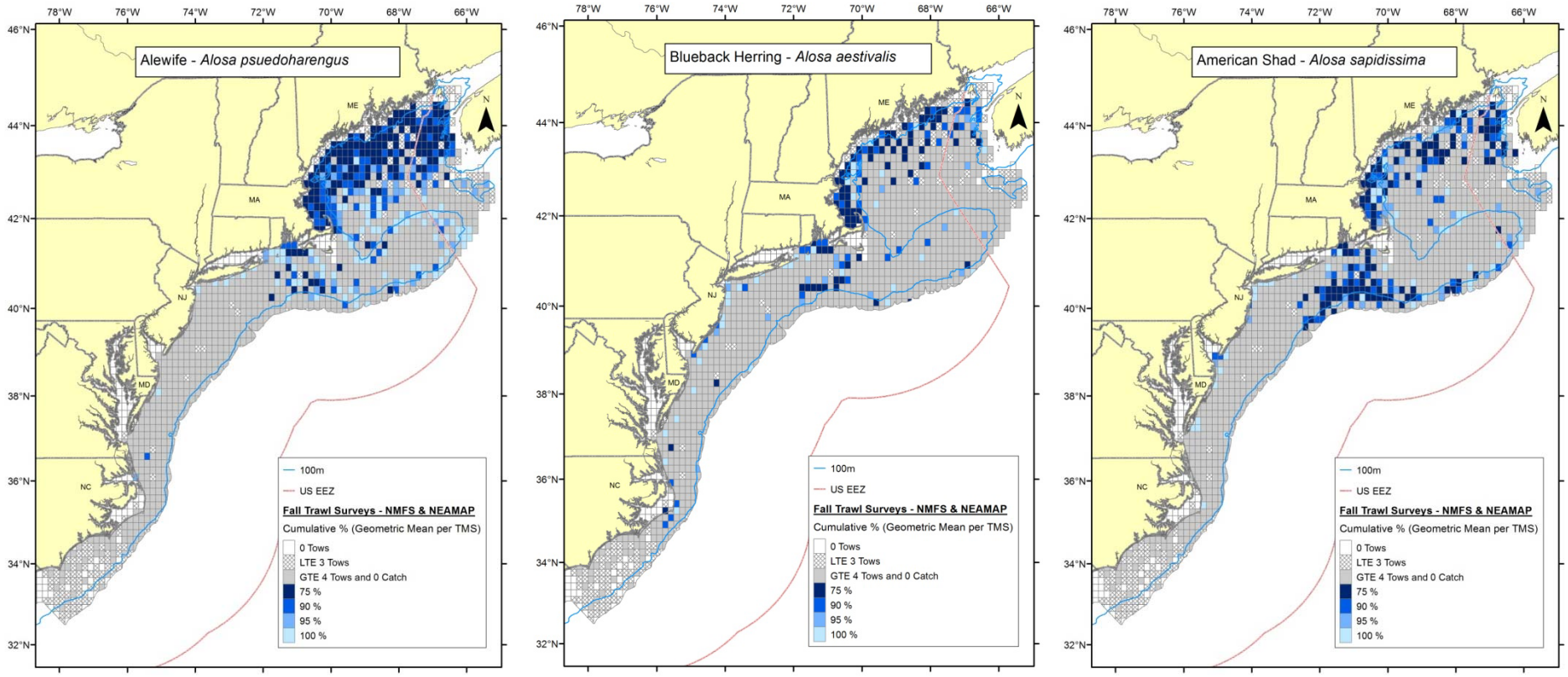


Figure 25. Distribution maps showing cumulative percentages (75, 90, 95 and 100%) of the geometric mean densities of *Alosa pseudoharengus*, *A. aestivalis*, and *A. sapidissima* during the 1975-2010 NEFSC fall bottom trawl surveys.

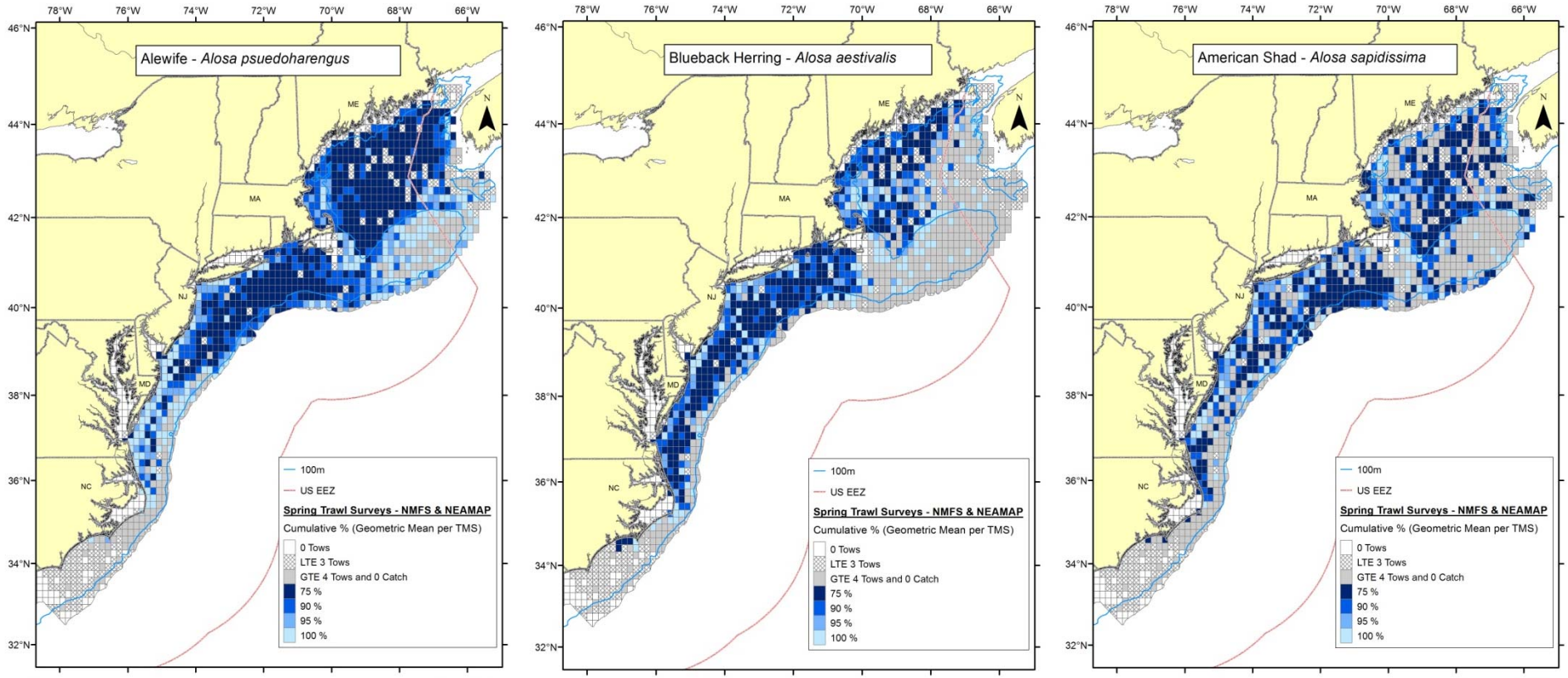


Figure 26. Distribution maps showing cumulative percentages (75, 90, 95 and 100%) of the geometric mean densities of *Alosa pseudoharengus*, *A. aestivalis*, and *A. sapidissima* during the 1976-2010 NEFSC spring bottom trawl surveys.

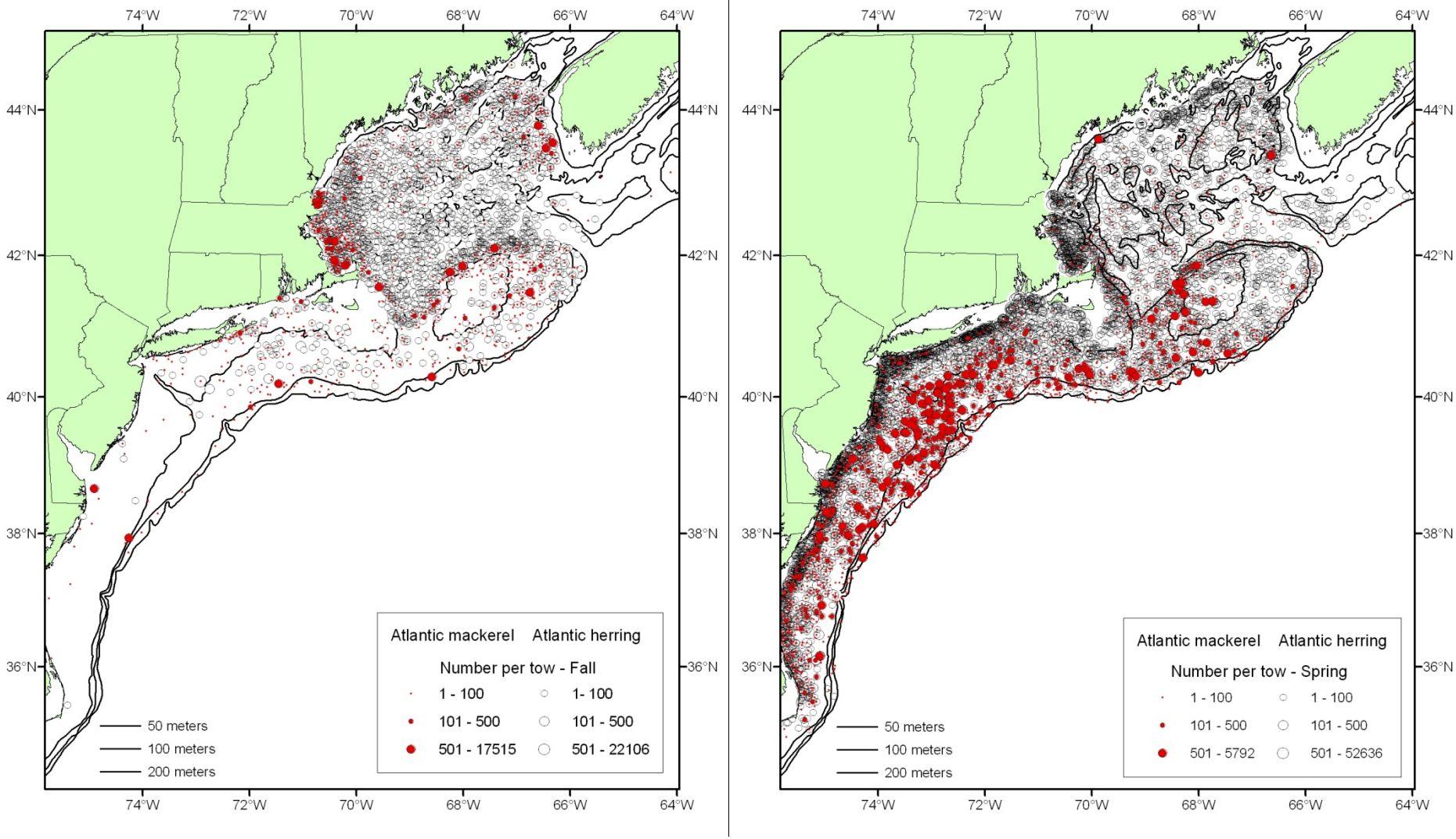


Figure 27. Distribution maps of Atlantic mackerel and Atlantic herring during NEFSC fall (left) and spring (right) bottom trawl surveys, 1976-2010.

Appendix 2 - R/H Catch Estimates

FMAT Working Paper (DO NOT CITE) **9/15/2011**

Part II. Analyses for Amendment 14 to the Atlantic mackerel, squid and butterfish Fishery Management Plan

1.0 Estimates of incidental catch

1.1 Methods

Total incidental catch of river herring (alewife and blueback herring) and hickory and American shad (RHS) was quantified by fleet. Fleets included in the analyses were those sampled by the Northeast Fisheries Observer Program (NEFOP) and were stratified by region fished (Mid-Atlantic versus New England), time (year and quarter), gear group, and mesh size. Estimates that are restricted to a subset of trips identified as "targeted" trips for specific species were not used. These estimates are considered to be incomplete because the catches that occur on trips outside the trip subset are excluded. Furthermore, multiple species, such as Atlantic herring and mackerel, are often caught in a mixed fishery on the same trips during portions of the year. As such, defining targeted trips using a catch weight limit may lead to double counting of RHS incidental catch.

Region fished was defined using Statistical Areas for reporting commercial fishery data (Figure 1). The Mid-Atlantic region included Statistical Areas greater than 600, and New England included Statistical Areas 464 through 599. Gear groups included in the analyses were: bottom trawls, paired midwater trawls, single midwater trawls, gillnets, dredges, handlines, haul seines, longlines, pots/traps, purse seines, scallop trawl/dredge, seines and shrimp trawls. Bottom trawls and gillnets were further stratified into mesh groups. The estimated levels of precision when gillnet and bottom trawl incidental catches were quantified across all mesh sizes were very similar, and not consistently lower, than the precision estimates for these gears when estimated by mesh category. Since there was no gain in precision when we did not stratify by mesh, we split bottom trawl and gillnets into the following mesh categories:

Mesh category	Bottom Trawl	Gillnet
small	mesh $\leq$ 3.5	mesh $<$ 5.5
medium	3.5 $<$ mesh $<$ 5.5	---
large	mesh $\geq$ 5.5	5.5 $\leq$ mesh $<$ 8
x-large	---	mesh $\geq$ 8

Single and paired midwater trawls were split into separate fleets because the majority of both mackerel and herring landings during 2005-2010 were from paired midwater trawls, and the total catch-to-kept ratios varied between midwater trawl types.

The combined ratio method (Wigley et al 2007) is the standard discard estimation method implemented in NEFSC stock assessments. We used this method to quantify and estimate the precision (CV) of RHS total incidental catch for 1989 – 2010 across all fleets. Incidental catch estimates for the midwater trawl fleet are only provided for 2005-2010

because the estimates are most accurate as a result of improved sampling methodologies described below. Estimates of the precision are necessary in order to evaluate significant differences between incidental catch estimates by fleet and year.

Marked improvements to NEFOP sampling methodologies occurred in the high-volume midwater trawl (MWT) fisheries beginning in 2005, limiting the interpretability of estimates from these fleets in prior years. The NEFOP currently deploys specially-certified observers on paired and single midwater trawl vessels and purse seine vessels. NEFOP coverage of these high-volume fisheries that pump catch began in 2003 but the sampling focused on marine mammal interactions. In 2005, the focus of the sampling changed and the priorities became quantification of groundfish bycatch. At this time, the NEFOP implemented the catch composition log and observers began sampling the catches using a basket subsampling methodology in order to more accurately estimate catch weights over the course of pumping operations. At the same time, NEFOP protocols also required a more accurate quantification of the catches culled by the crew. Therefore, incidental catch estimates are provided beginning in 2005 because they are considered more accurate.

The NEFOP data used in this analysis were aggregated at the trip level. The sampling unit for the NEFOP database is a trip (Wigley et al. 2007) and observer sea days are allocated at the trip and fleet level, in contrast to the haul level. In addition, hauls within a trip are not independent of one another and are considered to be pseudo-replicates. The numbers of trips included in the analyses, for the Mid-Atlantic and New England regions, are presented in Tables 1 and 2, respectively.

For each trip, NEFOP data were used to calculate a total catch to kept (t/k) ratio, where t represents the total (retained+discarded) catch of an individual species (e.g., alewife, American shad) and k is the kept weight of all species. Annual estimates of total incidental catch were derived by quarter. Imputations were used for quarters with one or less observed trips.

The t/k ratios were expanded using a raising factor to quantify total incidental catch. With the exception of the midwater trawl fleets, total landed weight of all species (from the dealer database) was used as the raising factor. Total landings from the dealer database are considered to be more accurate than those of the VTR database because VTR landings represent a captain's hail estimate. However, for the MWT fleets, we were unable to use the dealer data to estimate the kept weight of all species when stratifying by fishing area. When the area allocation (AA) tables were developed, MWT was not included in effort calculations because of difficulties determining effort for paired MWTs. Only those gears with effort information could be assigned to a Statistical Area. Given these limitations, VTR data were used as the expansion factor for the MWT fleet.

When quantifying incidental catch across multiple fleets, total kept weight of all species is an appropriate surrogate for effective fishing power because it is likely that all trips will not exhibit the same attributes (Wigley et al 2007). The use of effort without standardization makes the implicit assumption that effort is constant across all vessels, thereby resulting in a biased effort metric.

1.2 Results

1.2.1 Temporal distribution of incidental catches

The temporal distribution of incidental catches was summarized by quarter and fishing region (i.e., New England versus Mid-Atlantic), for the most recent six-year period (2005-2010), to take into account any effects that the most recent management changes may have had on the fleets included in the analyses. The gear types which exhibited the highest incidental catches of the combined four species consisted of bottom trawls, midwater trawls and gillnets. These gears comprised 92% of the total incidental catches in the Mid-Atlantic from all gear types and 97% in New England.

Incidental catches of the four species combined varied by region and quarter for each gear type. For the three predominant gear types, most of the catch of the four species combined was taken in midwater trawls (72%, of which 53% was from paired midwater trawls and the rest from single midwater trawls), followed by 24% in small mesh bottom trawls and 3% in large mesh gillnets (Table 3). Most of the catch (58%) occurred in the New England region where catches were higher for all three gear types; 36% taken in midwater trawls, followed by 18% in small mesh bottom trawls and 3% in large mesh gillnets. The highest quarterly catch (34%) occurred during Quarter 1 (Q1) in the Mid-Atlantic, of which the majority (32%) was taken in midwater trawls. The second and third highest quarterly catches of all four species occurred during Q4 (21%) and Q2 (14%) in New England. About 16% and 11% of the catches in New England during Q4 and Q2, respectively, were taken in midwater trawls.

Catches of all four species taken in midwater trawls during Q1 in the Mid-Atlantic and during all four quarters in New England comprised 69% of the total incidental catch during 2005-2010 (Table3). Small mesh bottom trawl catches in New England comprised an additional 19% of the total incidental catch and were highest during Q1 (7%) followed by Q3 (5%), Q4 (4%) and Q2 (3%). Catches in large mesh gillnets were highest in New England, comprising 3% of the total incidental catch, and were highest during Q3 and Q4 (both totaling 1%).

Given the similar migration patterns between the two shad species and between alewife and blueback herring, incidental catches were also summarized separately for river herring and shads. Shad catches occurred primarily in midwater trawls (42% of which 32% were from paired midwater trawls and the rest from single midwater trawls), followed by large mesh gillnets (27%) and small mesh bottom trawls (26%, Table 4). Shad catches were highest in the New England region (69%) and ranked from high to low were 29%, 23% and 13% for midwater trawls, large mesh gillnets and small mesh bottom trawls, respectively. Quarterly trends in shad catches were highly variable. The highest quarterly catches of shad occurred in midwater trawls during Q4 in New England (13%) and during Q1 in the Mid-Atlantic (12%), followed by catches taken during Q3 (9%) and Q4 (9%) in large mesh gillnets in New England.

River herring catches also occurred primarily in midwater trawls (76%, of which 56% were from paired midwater trawls and the rest from single midwater trawls), followed by small mesh bottom trawls (24%, Table 5). Catches of river herring in gillnets were negligible. Across gear types, catches of river herring were greater in New England (56%) than in the

Mid-Atlantic (44%). The percentages of midwater trawl catches of river herring were similar between New England (37%) and the Mid-Atlantic (38%). However, catches in New England small mesh bottom trawls were three times higher (18%) than those from the Mid-Atlantic (6%). Overall, the highest quarterly catches of river herring occurred in midwater trawls during Q1 in the Mid-Atlantic (35%), followed by catches in New England during Q4 (16%) and Q3 (11%). Quarterly catches in small mesh bottom trawls were highest in New England during Q1 (7%) and totaled 3-4% during each of the other three quarters.

1.2.2 Species-specific incidental catch estimates for 2005-2010

From 2005-2010, the total annual incidental catch of alewife ranged from 19.0-473.3 metric tons (mt) in New England and 8.9-256.2 mt in the mid-Atlantic. The dominant gear varied across years between paired midwater trawls and bottom trawls (Figure 2). Corresponding estimates of precision exhibited substantial interannual variation and ranged from 0.28-3.12 across gears and regions. In all years and regions, the small mesh category dominated alewife bottom trawl catches (Figure 3). With the exception of 2007, alewife catches in the mid-Atlantic were greatest in the first quarter and dominated by paired and single midwater trawls (Figure 4). In quarters 2-4, mid-Atlantic alewife catches were primarily from small mesh bottom trawls. In contrast, New England catches of Alewife generally increased with quarter, and with the exception of 2007, were consistently greatest in the fourth quarter. New England alewife catches represented a mixture of single midwater trawls, paired midwater trawls and small mesh bottom trawls.

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. Across years paired and single midwater trawls exhibited the greatest blueback herring catches, with the exception of 2010 in the mid-Atlantic where bottom trawl was the most dominant gear (Figure 5). Corresponding precision estimates ranged from 0.27 – 3.65. The small mesh category dominated blueback herring bottom trawl catches (Figure 6). Similar to alewife, blueback herring catches were greatest in the 1st quarter in the Mid-Atlantic and, with the exception of 2007, in the fourth quarter in New England. In the mid-Atlantic, blueback herring catches were predominantly from midwater trawls. While small and medium mesh bottom trawls comprised approximately 60% of the total annual mid-Atlantic catch in 2007, the magnitude of this 2007 catch was small compared to other years. In New England, catches were largely from midwater trawls and to a lesser extent small mesh bottom trawls.

Total annual American shad incidental catches from 2005-2010 were generally less than that of the river herring species and ranged from 12.7–53.2 mt in New England and 5.9-36.6 mt in the mid-Atlantic. In contrast to both river herring species, the greatest annual American shad catches were due to gillnets as well as single MWTs, paired MWTs, and bottom trawls. Corresponding coefficients of variation ranged from 0.19 – 10.7. Within the bottom trawl fleet, the small mesh category generally exhibited the greatest catches; however, American shad were also caught in medium and large mesh bottom trawl fleets (Figure 9). Across regions and years, the large-mesh category generally dominated gillnet catches. Similar to the river herring species, American shad catches were greatest during the first quarter in the mid-Atlantic and the fourth quarter in New England. However, in contrast to the river herring species, the primary gears were more evenly distributed between midwater trawls, bottom trawls and large-mesh gillnets.

Total annual 2005-2010 hickory shad incidental catch was the smallest of all RHS species and ranged from 0.1–11.8 mt in New England and 1.0-8.7 mt in the mid-Atlantic. Across years, the dominant gear varied between bottom trawls, paired midwater trawls and gillnets (Figure 11). Precision estimates varied annually and ranged from 0.19–2.9 across gears and regions. Bottom trawl catches of hickory shad were predominantly comprised of the small mesh category, where gillnet catches were from both small and large mesh categories (Figure 12). Mid-Atlantic catches were more evenly distributed over quarter than for other RHS species, and were primarily comprised of small mesh bottom trawl and small and large mesh gillnets (Figure 13). The majority of New England quarterly catches was from midwater trawls, small-mesh bottom trawls and to a lesser extent large-mesh bottom trawls and gillnets.

Total annual incidental catch of unknown herring from 2005-2010 ranged from 5.2–228.2 mt in New England and 0.1 – 163.4 mt in the mid-Atlantic. The dominant gear by year and region varied between gillnet, paired MWT, single MWT, bottom trawl and the 'other' category (Figure 14). Corresponding coefficients of variation range from 0.2-0.8. Small- and large-mesh categories dominated unknown herring bottom trawl and gillnet catches, respectively (Figure 15). Mid-Atlantic catches were generally greatest in the first quarter and were from paired MWT, single MWT, small-mesh bottom trawl and large-mesh gillnets. New-England catches were approximately evenly distributed across quarter and largely from small-mesh bottom trawls and single MWTs (Figure 16).

Species-specific annual incidental catch estimates and the associated coefficients of variation are presented in Appendix 1.

1.2.2.1 Validation of incidental catch estimates

Species-specific total catch and discard estimates can be used to quantify the amount kept by calculating the difference between the two estimates. These kept estimates can then be compared to species-specific landings obtained from the dealer or VTR databases to serve as validation. For both the river herring and shad species groups, kept estimates did not track the landings well (Figure 17). For Atlantic herring, however, landings and kept estimates were quite similar during the last 4-5 years of the time series. This consistency between kept and landed Atlantic herring estimates indicates that the employed methodology can be used to reconstruct landings. The discrepancy between landings and kept estimates of the RHS species suggests an inconsistency in the identification of these species at the ports of landing.

1.2.2.2 Fisheries conducted by the fleets used in the incidental catch estimates

The incidental catch estimates are based on fleets (ex: gear, region, mesh) rather than fishery directivity. In order to identify the directivity of each of the fleets used in the incidental catch analysis, we analyzed trends in mackerel, herring, *Illex*, *Loligo*, and silver hake landings by month, area and mesh size. The analysis clearly indicated substantial fishery directivity overlap within fleets. For example, trends in mackerel and herring landings by gear indicate that both species are caught predominantly by paired midwater trawls (Figure 18).

Graphs of catch by codend mesh size recorded in the NEFOP database for observed hauls indicated an overlap in mesh sizes used on midwater trawl tows when the

target species (i.e., targspec1 field in the NEFOP database) is either mackerel or Atlantic herring (Figure 19a). About 85% of mackerel midwater trawl catches and 96% of herring midwater trawl catches occurred with mesh sizes between 24 and 50 mm. Similar overlap in mesh size was apparent in bottom trawl tows targeting either mackerel or silver hake. Bottom trawl mesh sizes between 48 and 76 mm represented 99% of mackerel catches and 77% of silver hake catches (Figure 19b).

Some segregation in mackerel and herring 2005-2010 landings by Statistical Area was apparent (Figure 20a). The greatest proportions of herring midwater trawl landings occurred in New England (specifically Statistical Areas 512 through 522), whereas the greatest proportions of mackerel landings occurred in the Mid-Atlantic (Statistical Areas 612-622). However, there was some overlap in regional trends between the two species. For example, 20% of the total mackerel landings were from New England (Statistical Areas 525-537) and 19% of the total Atlantic herring landings were from the Mid-Atlantic. Similarly for bottom trawl landings, the greatest proportions of mackerel landings occurred in Mid-Atlantic statistical areas 612-622 and the greatest proportions of silver hake landings occurred in New England statistical areas 513-538 (Figure 20b). However, overlap was still apparent; 15% of total mackerel landings were caught in New England and 25% of total silver hake landings were from the Mid-Atlantic. Accordingly, Statistical Area alone does not appear to permit separation of fleets into fisheries.

Analysis of mackerel and herring landings by month and region indicated a mixed midwater trawl fishery from January-April in both the Mid-Atlantic and New England (Figure 21a). In the Mid-Atlantic, landings during January-April represented the vast majority (98%) of regional midwater trawl landings. Of the total January-April combined mackerel and herring landings from the Mid-Atlantic, between 24-39% were herring and 61–76% were mackerel. In New England, January-April landings only represented 21.7% of regional midwater trawl landings. Of the combined mackerel and herring landings, 32-41% were herring and 55-68% were mackerel. Analysis of mackerel, *Loligo* and silver hake bottom trawl landings by both region and month indicated a mixed fishery throughout the year (Figure 21b). While most mackerel landings occurred in January-April and most *Illex* landings occurred from June-October, silver hake and *Loligo* landings largely occurred throughout all months in both regions. Further examination of the distribution of January-April landings by Statistical Area indicated substantial overlap in both regions within both bottom trawl and midwater trawl fleets (Figure 22).

Based on trends in landings over time, region, gear and mesh category, and the strong evidence for mixed fisheries, it is not possible to clearly identify fishery directivity for each of the fleets used in the incidental catch analysis.

1.2.3 Spatial distribution of incidental catches

ArcGIS software (v. 10, ©ESRI) was used to produce maps of nominal fishing effort (days fished, from the Vessel Trip Reports), by ten-minute square (TNMS), for the gear types with the highest levels of incidental catch of each the four subject species during 2005-2010 (refer to Section 1.2.1). As previously noted, 2005-2010 was considered as the

reference time period because it takes into account any effects that the most recent management changes may have had on the temporal and spatial distributions of the fleets included in the analyses. Gear types that were mapped included small mesh bottom trawls, single midwater trawls, paired midwater trawls and large mesh gillnets. Each TNMS was shaded according to the cumulative percentage of the total effort for the mapped time period. For each gear type, CPUE (kept+discarded weight of each of the four species / days fished) was computed from NEFOP data using observed tows. It should be noted that the days fished data from the Vessel Trip Reports (VTR) differ from the days fished data used to compute CPUE. The latter type of data is more accurate because it represents the sum of the actual tow durations within each TNMS, whereas days fished data from the VTRs represent the product of the average tow duration and the number of tows conducted during a subtrip as reported by each captain. Likewise, the data resolution of the geographic location data used to map VTR effort data differs from that used to map the NEFOP CPUE data. Mapping of the VTR data by TNMS represents a post-stratification of the effort data because captains are only asked to report a single fishing location (as a Statistical Area and a single latitude/longitude location within the Statistical Area) within each Statistical Area that is fished during a trip. The assignment of NEFOP CPUE data to each TNMS is more accurate because catch and effort data are recorded for each tow location.

For each map, CPUE data were mapped as the center point of a TNMS and overlain on the fishing effort layer to determine: 1.) where CPUE levels were highest; 2.) whether high incidental catch rates coincided with high levels of fishing effort; and 3.) to characterize the variability in temporal and spatial trends in effort and CPUE with respect to the potential for establishing closed areas or gear restriction areas to reduce bycatch of the four alosid species. Maps from the 2005-2010 reference period were compared to the 1999-2004 period to determine the degree of spatial consistency in broad-scale patterns of fishing effort for each gear type and incidental catch rates of each species. For comparative purposes, CPUE data classes used in the map legends for each of the two time periods were the same within each gear type. For midwater trawls, nominal effort and CPUE were not mapped for 1999-2004 because VTRs were not mandatory for the midwater trawl herring fleet until 2001 and, as previously explained in Section 1.1, the methods used by NEFOP fishery observers to quantify large-volume catches in the midwater trawl fleets were most accurate beginning in 2005 and the number of midwater trawl trips sampled by NEFOP was much higher.

1.2.3.1 Maps of CPUE and effort, by fleet, for each species

As concluded in Section 1.2.1, most of the total incidental catch of river herring during 2005-2010, as well as the two shad species, occurred in midwater trawls (mainly in paired midwater trawls). Incidental catch rates of both alewife and blueback herring in paired midwater trawls during 2005-2010 were similar and were highest across broad areas in the western Gulf of Maine (SA 521 and 514 along and shoreward of the 100 m isobath), off the coast of central NJ (SA 612, 615 and 616), and scattered throughout southern New England (particularly off Rhode Island in Block Island Sound and along the southeast shore of Long Island, Figure 23). The highest catch rates of both species did not always coincide with the highest fleet effort. Catch rates of hickory shad in

paired midwater trawls were much lower than those of American shad and occurred primarily in the western Gulf of Maine (Figure 24). American shad catch rates were highest in the same general areas as river herring, with the exception that American shad catch rates were lower in southern New England.

The second highest levels of incidental catches of each of the four alosid species occurred in small mesh bottom trawls. Fishing effort in the small mesh bottom trawl fleet varied between 2005-2010 and 1999-2004. During 1999-2004, effort occurred across a broader area, in the western Gulf of Maine and was much higher in southern New England (Figure 25). Incidental catch rates of blueback herring and alewife were also different between the two time periods, with the highest rates occurring in and around Block Island Sound during 2005-2010, but occurred offshore, for blueback herring, in scattered TNMS within SA 612, 613, 615 and 616 during 1999-2004 (Figures 25 and 26). Similar to the paired midwater trawl fleet, the highest incidental catch rates of both species did not always coincide with the highest levels of effort (e.g., Block Island Sound catch rates during 2005-2010). Catch rates of American shad in small mesh bottom trawls (Figure 27) were much higher than for hickory shad (Figure 28), similar to catch rates of the two shad species in paired midwater trawls. Catch rates of American shad in small mesh bottom trawls varied between the time periods and were highest in the vicinity of Long Island Sound during 2005-2010, followed by a broad range of mostly contiguous offshore areas in the Mid-Atlantic and southern New England (between the 100 and 400 m isobaths). During 1999-2004, catch rates of American shad and hickory shad were highest in the offshore areas, particularly in the southern portion of SA 537 between the 100 and 400 m isobaths (Figure 27 and 28).

Of the four bycatch species, most of the incidental catch in large-mesh gillnet fleet consists of the two shad species. Although fleet effort was highest off MA and NH (mainly inside of 100 m) during 2005-2010, catch rates of American shad were highest in areas where the fleet's effort was lowest; in the central Gulf of Maine in SA 515 (Figure 29). Incidental catches of hickory shad were extremely low (Figure 30).

Some of the maps included in the analysis showed CPUE data within ten-minute squares which lacked VTR effort data. Where this disconnect occurred in state waters, it may have been attributable to the fact that those vessels were not required to have federal permits, and thus, not required to submit VTRs. When this disconnect occurred seaward of the boundary for state territorial waters, it may have been due to incomplete submittals of VTR data for all trips, but more likely was due to differences between the spatial resolution of the VTR and NEFOP effort data.

1.2.3.2 Maps of CPUE and effort, by fleet and quarter, for all four species combined

A second series of CPUE and effort maps was prepared for single and paired midwater trawls combined and small mesh bottom trawls, by quarter, during 2005-2010 because these two gear types comprised a majority of the incidental catches of all four species

during this time period (Table 3). Incidental catches of all four species were mapped on a quarterly basis to provide a comprehensive summary of the data in time and space. Within each of the two gear types, the CPUE and effort data are comparable across quarters.

During 2005-2010, catch rates of all four species combined were highest in midwater trawls during Q1 and Q4 and were distributed across very large areas, but the areas were not always contiguous (Figures 31 and 32). During Q1, catch rates were very high in Block Island Sound and off eastern Long Island as well as in scattered areas of the Mid-Atlantic off New Jersey (Figure 31). During Q4, catch rates were highest in the western Gulf of Maine, along the 100 m isobath between Cape Cod, Massachusetts and New Hampshire and were also very high in an area of low effort by the fleet located south of Martha's Vineyard (Figure 32).

During 2005-2010, catch rates of all four species combined were highest in small mesh bottom trawls during Q1 and Q2 and were also distributed across very large areas, but which were generally contiguous (Figures 33 and 34). During Q1, the highest catch rates occurred in and around Block Island Sound, followed secondarily by the area of highest effort which was located near the shelf edge and north of a the Southern Gear Restricted Area (polygon denoted as a dashed line in the Mid-Atlantic). The high catch rates in Block Island Sound occurred primarily in Statistical Area 538, and also adjacent portions of SA 611 and SA 537, but effort by the small mesh bottom trawl fleet is unknown.

1.2.3.3 Effectiveness of closed areas to reduce alosid bycatch

The establishment of year-round and/or seasonal closed areas (CAs) and/or gear restriction areas (GRAs) was evaluated as a potential management measure to reduce incidental catches of the subject alosid species. The degree of effectiveness of CAs and GRAs in accomplishing this objective is dependent on the degree of temporal and spatial overlap between the distribution of fishing effort for the fleets with the predominant bycatch and the distribution of the bycatch species, and more importantly, the interannual consistency of such overlap. If the highest incidental catches consistently occur across a reasonably small area each year, then CAs and/or GRAs may be effective. However, if the opposite situation is true, the size of the CA and/or GRA must be large in order to encompass the spatial extent of the interannual variability, and therefore, may not be practicable. In addition to these considerations, quantification of the effectiveness of CAs and GRAs is difficult for mobile species.

Maps of NEFSC spring and fall survey catches (presented in Part I) indicate that the seasonal and interannual distributions of all four species are highly variable in time and space. In addition, the analyses presented herein indicate that the incidental catches of all four bycatch species, as well as effort patterns in the predominant fleets which catch theses species are also highly variable in time and space. This is because of all four species undergo extensive coastwide migrations, which are largely influenced by water temperatures, and because the predominant gear types which incidentally catch these

species (e.g., Atlantic herring and Atlantic mackerel in the MWT fleet and *Loligo*, *Illex*, hakes, and Atlantic mackerel in the small mesh BT fleet) are seeking target species which are also highly migratory. For example, the interannual variability in the spatial distribution of fishing effort in the midwater trawl fleet was quite variable during 2005-2010 (Figure 35). There was less variability in the annual effort distributions for the small mesh bottom trawl fleet, but during some years (e.g., 2005 and 2007) very little effort occurred inshore (Figure 36). Commercial catches of Atlantic mackerel also showed substantial interannual variability in the spatial distribution of monthly catches (Figures 37 and 38).

In conclusion, as a result of the high degree of interannual and seasonal variability in the spatial distributions of the four bycatch species as well as in the fishing effort of for the midwater trawl and small mesh bottom trawl fleets which incidentally catch these species, closed areas are not considered to be an effective management measure for the reduction of incidental catch of the four species addressed herein.

Table 1: Total number of trips recorded for each fleet in the observer, dealer and VTR databases for the Mid-Atlantic. Landings from the VTR database were used as the raising factor to estimate catch in the midwater trawl fleets. For all other fleets, the dealer database was used.

	Number of trips									
	Bottom trawl						Midwater trawl			
	Small mesh		Medium mesh		Large mesh		Single		Paired	
Year	Observer	Dealer	Observer	Dealer	Observer	Dealer	Observer	VTR	Observer	VTR
1989	29	1,781	7	412	1	7				
1990	31	1,363	19	386	0	11			0	0
1991	61	1,711	20	361	4	100	5	0	0	0
1992	39	1,294	12	283	14	284			9	0
1993	6	1,167	1	103	7	441			14	0
1994	6	2,170	6	156	14	1,998	1	64	30	44
1995	60	2,918	3	330	53	3,332	0	120	33	50
1996	68	3,143	10	652	16	3,344	0	264	0	14
1997	41	3,426	9	692	5	3,711	0	210	0	6
1998	24	3,693	3	784	13	3,647	0	239	0	34
1999	26	3,250	9	777	5	3,865	0	205	0	26
2000	25	3,230	10	806	28	3,250	5	194	1	74
2001	42	2,684	12	879	44	3,886	0	170	0	56
2002	15	2,408	18	998	38	4,172	0	72	1	107
2003	21	1,637	51	795	11	4,208	0	115	5	195
2004	108	1,836	151	692	96	4,874	2	99	8	249
2005	74	1,086	101	466	88	6,478	4	81	11	221
2006	100	1,810	47	736	62	5,051	8	74	6	184
2007	86	1,711	139	714	159	3,899	1	86	2	83
2008	66	1,776	84	701	129	4,391	10	17	8	143
2009	169	2,031	125	661	162	4,737	5	27	20	162
2010	182	1,895	187	420	276	3,944	4	15	13	85

	Number of trips							
	Gillnet						Other	
	Small mesh		Large mesh		X-large mesh			
Year	Observer	Dealer	Observer	Dealer	Observer	Dealer	Observer	Dealer
1989	0	67	0	27			0	15,494
1990	0	137	0	1	0	3	1	16,633
1991	0	121	0	1			8	17,948
1992	0	100	0	5			15	17,042
1993	0	80	0	33			42	17,467
1994	83	85	58	57	20	24	42	15,086
1995	126	185	202	516	73	294	44	13,440
1996	133	343	172	531	65	638	24	14,109
1997	90	422	133	400	111	1,021	27	18,541
1998	100	699	130	456	73	1,403	36	16,378
1999	42	848	23	566	19	1,443	57	15,424
2000	49	1,110	17	543	18	1,954	72	15,308
2001	54	1,280	17	441	17	2,193	97	15,747
2002	34	1,267	10	376	11	2,139	96	16,653
2003	25	750	4	294	13	2,104	115	17,997
2004	12	1,303	6	475	38	1,409	330	16,892
2005	19	1,270	4	335	82	1,739	400	23,185
2006	20	1,160	7	500	32	1,470	144	25,122
2007	19	1,231	13	516	32	2,045	245	27,634
2008	7	905	2	642	44	2,029	506	25,958
2009	9	1,252	8	1177	43	1,693	433	25,787
2010	12	851	52	1122	91	1,455	283	16,538

Table 2: Total number of trips recorded for each fleet in the observer, dealer and VTR databases for New England. Landings from the VTR database were used as the raising factor to estimate catch in the midwater trawl fleets. For all other fleets, the dealer database was used.

	Number of trips									
	Bottom trawl						Midwater trawl			
	Small mesh		Medium mesh		Large mesh		Single		Paired	
Year	Observer	Dealer	Observer	Dealer	Observer	Dealer	Observer	VTR	Observer	VTR
1989	72	1,432	14	528	56	5,406			0	0
1990	33	1,665	4	355	54	5,851			0	0
1991	84	1,278	13	156	78	5,890	2	0	0	0
1992	56	1,348	1	120	68	5,531	0	0	0	0
1993	19	1,750	2	153	31	5,079	0	0	7	0
1994	9	3,426	2	239	27	8,341	0	306	4	53
1995	37	2,944	2	154	67	12,458	4	785	2	11
1996	47	2,665	2	51	39	12,475	0	902	0	18
1997	18	2,477	3	100	24	10,498	0	705	0	93
1998	5	2,979	0	94	11	11,095	0	508	0	170
1999	19	2,774	0	214	32	10,193	1	519	2	165
2000	8	2,297	9	124	99	11,064	7	463	0	367
2001	8	2,073	10	173	152	11,270	1	336	0	631
2002	35	1,625	29	221	214	11,138	0	371	0	651
2003	44	1,653	24	184	385	10,801	2	251	18	614
2004	86	1,283	83	152	525	9,343	23	254	60	581
2005	82	1,064	169	131	1341	8,388	43	265	91	463
2006	48	1,569	35	299	612	7,656	10	195	21	488
2007	57	1,745	18	213	618	7,461	10	84	11	235
2008	46	2,016	16	175	751	7,688	11	34	36	185
2009	195	1,895	23	270	877	7,373	10	48	67	223
2010	206	2,227	50	251	1049	6,043	29	57	106	213

	Number of trips							
	Gillnet						Other	
	Small mesh		Large mesh		X-large mesh			
Year	Observer	Dealer	Observer	Dealer	Observer	Dealer	Observer	Dealer
1989	0	10	0	497	0	1	40	28,527
1990	0	10	0	712			32	30,631
1991	0	50	0	1045	0	2	79	33,011
1992			0	1159	0	47	144	33,574
1993			0	1133	0	81	118	33,700
1994	0	3	61	2870	40	934	107	28,586
1995	0	8	105	6910	46	2,029	101	31,904
1996	0	21	55	6448	23	1,533	62	35,361
1997	0	12	51	5854	19	1,214	32	35,373
1998	3	14	115	5202	15	1,061	15	32,140
1999	1	6	98	3860	21	1,352	34	25,018
2000	0	17	107	4187	50	1,881	229	21,374
2001	1	17	69	4280	33	2,530	28	22,532
2002	0	14	91	3724	41	2,810	30	23,239
2003	0	20	326	4485	190	2,987	72	20,573
2004	1	16	699	3342	536	2,966	240	16,696
2005	0	39	587	3491	459	2,939	484	39,261
2006	0	67	142	3866	79	2,416	262	47,023
2007	2	78	132	5467	164	2,102	317	43,561
2008	3	27	170	6538	112	2,274	368	55,716
2009	2	12	313	6824	76	1,989	243	66,351
2010	0	22	1267	5374	771	2,653	383	150,268

Table 3: Proportion of 2005-2010 incidental catch of all river herring and shad species by region, fleet and quarter.

	Bottom Trawl				Gillnet		Paired MWT	Single MWT	Total MWT	Grand Total
	lg	med	sm	xlg	lg	sm	all	all		
Mid-Atlantic (SA >= 600)	**0.001**	**0.002**	**0.062**	**0.000**	**0.005**	**0.001**	**0.270**	**0.083**	**0.353**	**0.424**
Q1	0.000	0.001	0.018	0.000	0.002	0.000	0.246	0.074	0.320	0.342
Q2	0.000	0.000	0.012	0.000	0.001	0.000	0.016	0.007	0.023	0.037
Q3	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.001	0.002	0.026
Q4	0.000	0.001	0.010	0.000	0.001	0.000	0.007	0.000	0.008	0.020
New England (SA <= 500)	**0.007**	**0.000**	**0.177**	**0.000**	**0.028**	**0.000**	**0.259**	**0.105**	**0.364**	**0.576**
Q1	0.002	0.000	0.065	0.000	0.003	0.000	0.025	0.015	0.040	0.111
Q2	0.002	0.000	0.030	0.000	0.004	0.000	0.056	0.051	0.107	0.142
Q3	0.002	0.000	0.046	0.000	0.011	0.000	0.050	0.007	0.057	0.115
Q4	0.002	0.000	0.037	0.000	0.010	0.000	0.128	0.031	0.159	0.208
Grand Total	**0.008**	**0.002**	**0.239**	**0.000**	**0.033**	**0.001**	**0.529**	**0.188**	**0.716**	**1.000**

Table 4: Proportion of 2005-2010 incidental catch of American and hickory shad by region, fleet and quarter.

	Bottom trawl				Gillnet		Paired MWT	Single MWT	Total MWT	Grand Total
	lg	med	sm	xlg	lg	sm	all	all		
Mid-Atlantic (SA >= 600)	**0.004**	**0.012**	**0.115**	**0.000**	**0.041**	**0.008**	**0.115**	**0.016**	**0.132**	**0.312**
Q1	0.001	0.006	0.030	0.000	0.014	0.003	0.103	0.014	0.117	0.172
Q2	0.001	0.001	0.022	0.000	0.012	0.001	0.010	0.001	0.011	0.049
Q3	0.001	0.001	0.045	0.000	0.004	0.002	0.000	0.000	0.001	0.054
Q4	0.001	0.004	0.018	0.000	0.011	0.002	0.002	0.000	0.003	0.038
New England (SA <= 500)	**0.027**	**0.000**	**0.140**	**0.001**	**0.233**	**0.000**	**0.208**	**0.078**	**0.286**	**0.688**
Q1	0.007	0.000	0.036	0.000	0.028	0.000	0.019	0.006	0.025	0.096
Q2	0.007	0.000	0.030	0.000	0.032	0.000	0.043	0.013	0.056	0.125
Q3	0.006	0.000	0.048	0.000	0.089	0.000	0.054	0.021	0.075	0.219
Q4	0.006	0.000	0.027	0.000	0.085	0.000	0.092	0.038	0.130	0.248
Grand Total	**0.030**	**0.013**	**0.256**	**0.001**	**0.274**	**0.008**	**0.324**	**0.094**	**0.418**	**1.000**

Table 5: Proportion of 2005-2010 incidental catch of river herring by region, fleet and quarter.

	Bottom trawl				Gillnet		Paired MWT	Single MWT	Total MWT	Grand Total
	lg	med	sm	xlg	lg	sm	all	all		
Mid-Atlantic (SA >= 600)	**0.001**	**0.001**	**0.055**	**0.000**	**0.000**	**0.000**	**0.291**	**0.092**	**0.383**	**0.439**
Q1	0.000	0.000	0.017	0.000	0.000	0.000	0.265	0.082	0.347	0.365
Q2	0.000	0.000	0.010	0.000	0.000	0.000	0.017	0.008	0.025	0.036
Q3	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.001	0.002	0.022
Q4	0.000	0.000	0.009	0.000	0.000	0.000	0.008	0.000	0.008	0.017
New England (SA <= 500)	**0.004**	**0.000**	**0.182**	**0.000**	**0.000**	**0.000**	**0.266**	**0.109**	**0.374**	**0.561**
Q1	0.001	0.000	0.069	0.000	0.000	0.000	0.026	0.016	0.043	0.113
Q2	0.001	0.000	0.030	0.000	0.000	0.000	0.057	0.056	0.114	0.145
Q3	0.001	0.000	0.045	0.000	0.000	0.000	0.049	0.006	0.055	0.101
Q4	0.001	0.000	0.038	0.000	0.000	0.000	0.133	0.030	0.163	0.202
Grand Total	**0.005**	**0.001**	**0.237**	**0.000**	**0.000**	**0.000**	**0.556**	**0.200**	**0.757**	**1.000**

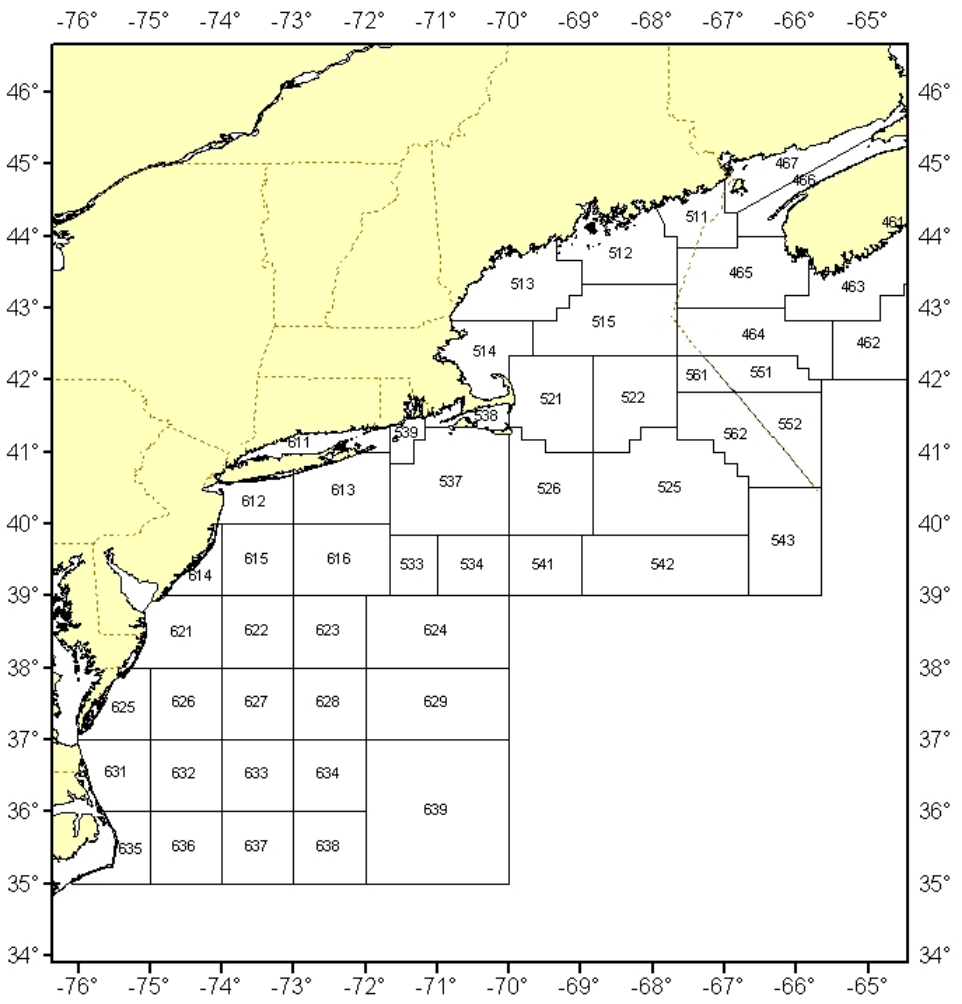


Figure 1: Statistical Areas used to define the fishing regions used in the incidental catch analysis. The Mid-Atlantic region included Statistical Areas greater than 600. The New England region included Statistical Areas 464 through 599.

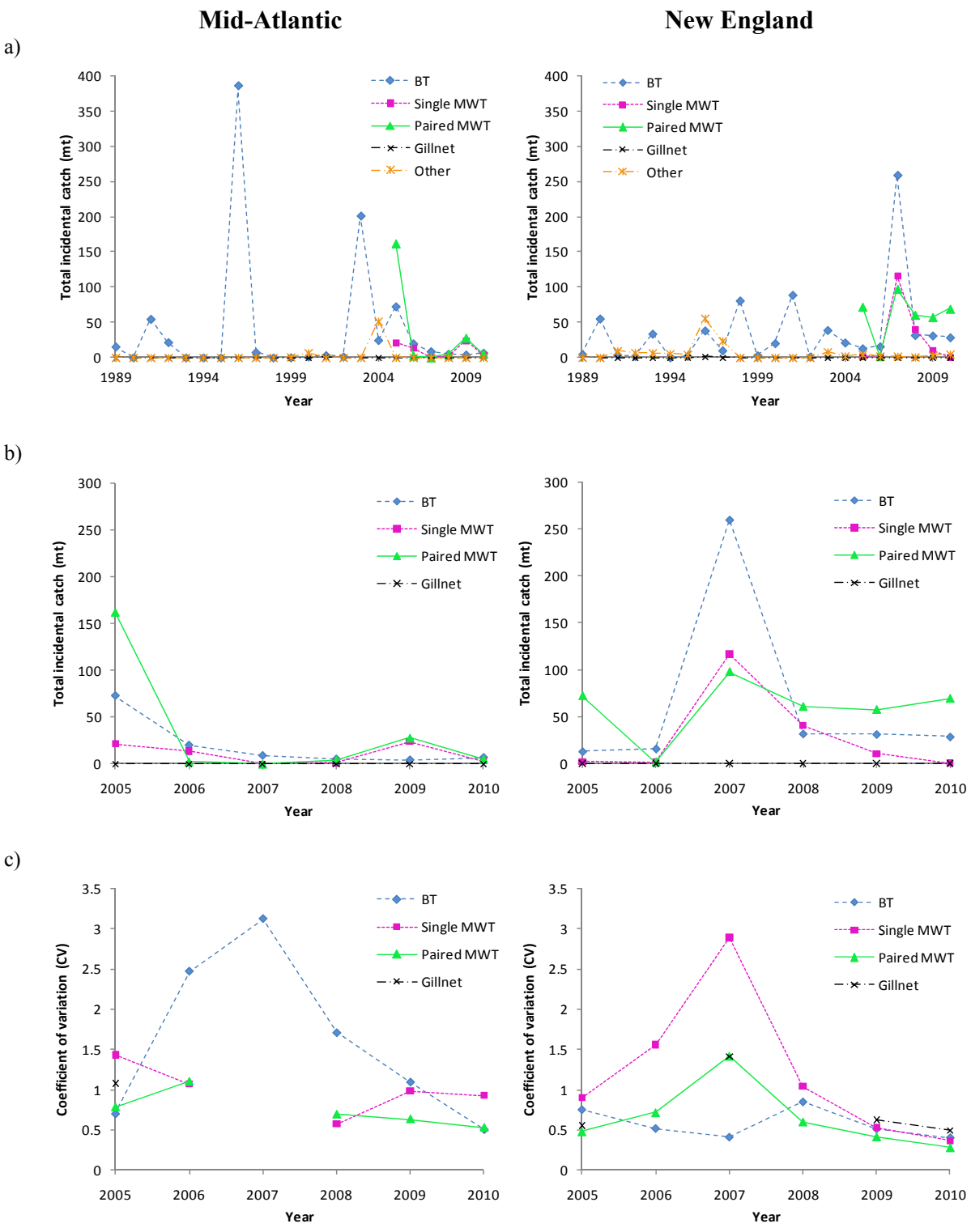


Figure 2: Alewife total annual incidental catch (mt) by region for the four gears with the largest catches from a) 1989 – 2010 and b) 2005 – 2010, and c) the corresponding estimates of precision. Midwater trawl estimates are only included beginning in 2005.

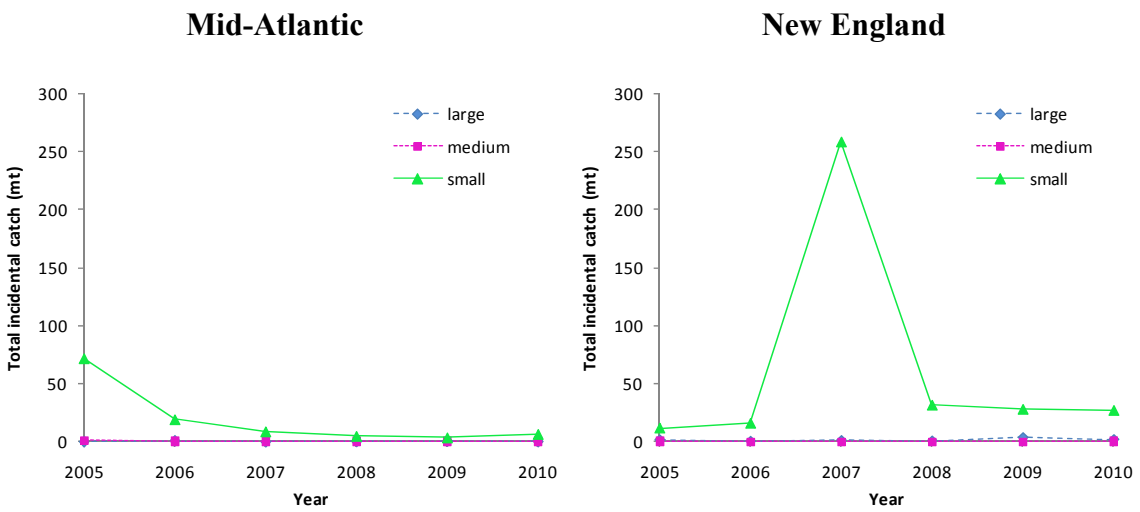


Figure 3: Alewife total incidental catch (mt) from 2005 – 2010 by region and bottom trawl mesh category.

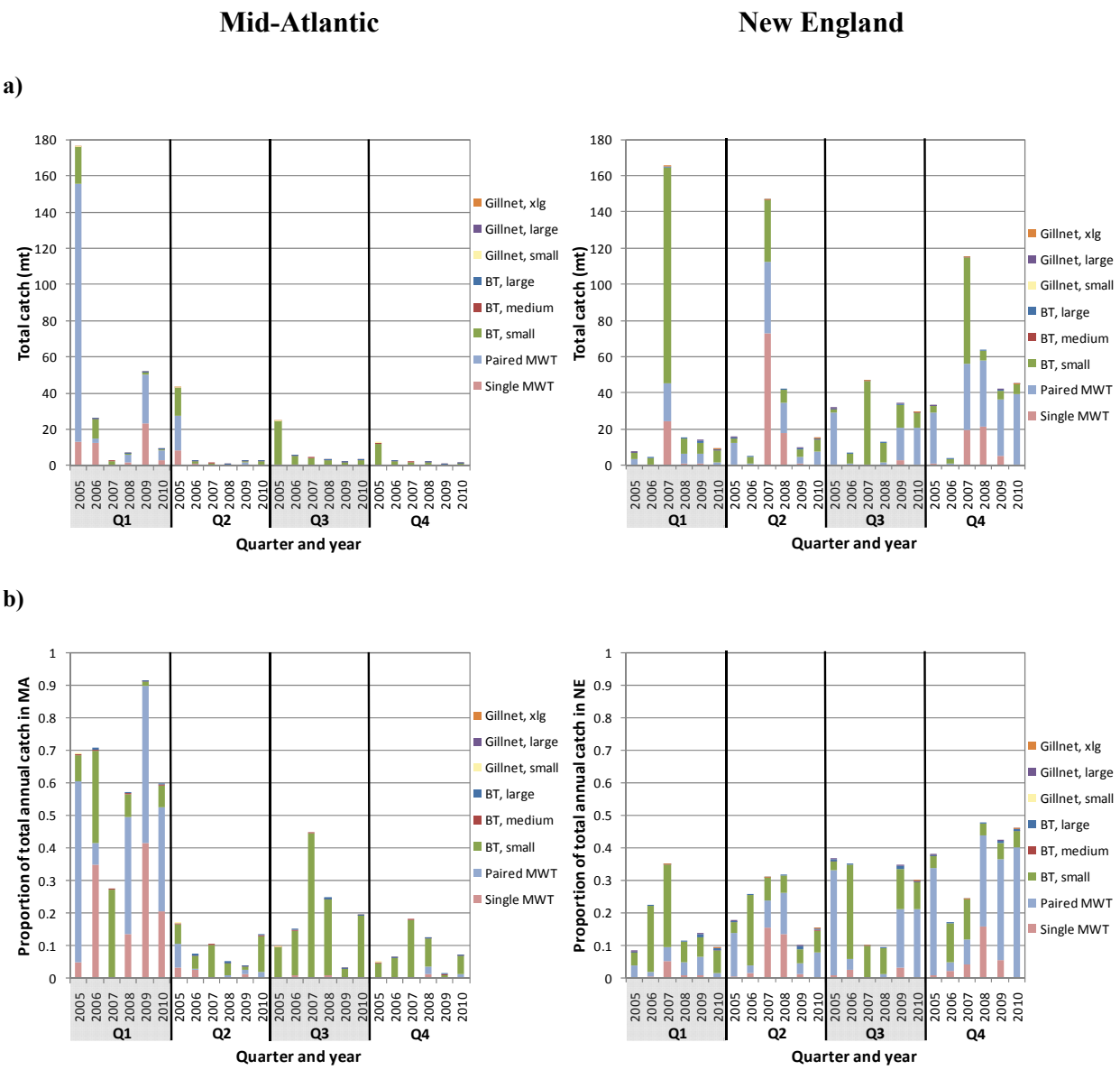


Figure 4: Alewife quarterly incidental catch (mt) by region and fleet (a) and the corresponding proportion of the total annual catch within each region and quarter (b).

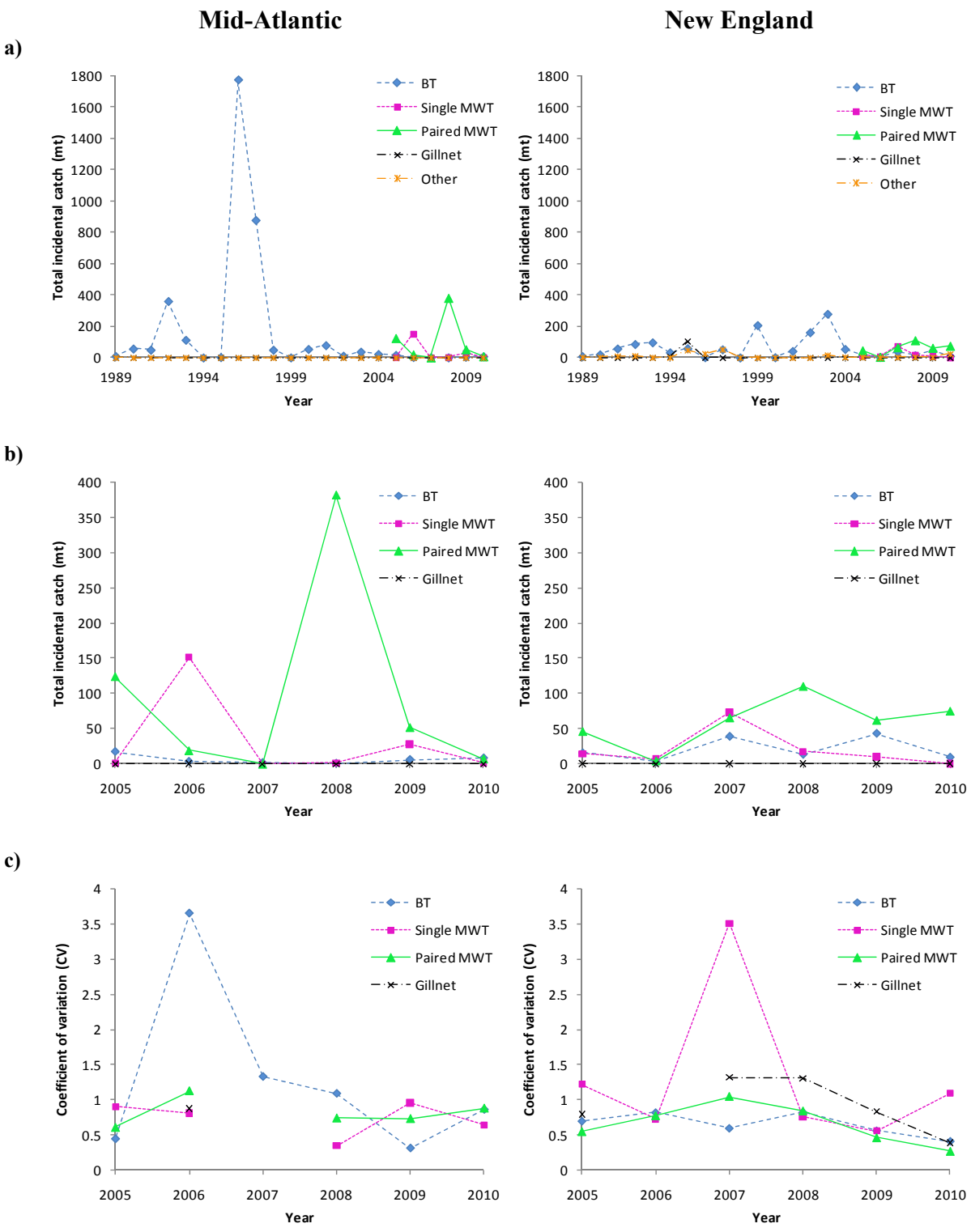


Figure 5: Blueback herring total annual incidental catch (mt) by region for the four gears with the largest catches from a) 1989 – 2010 and b) 2005 – 2010, and c) the corresponding estimates of precision. Midwater trawl estimates are only included beginning in 2005.

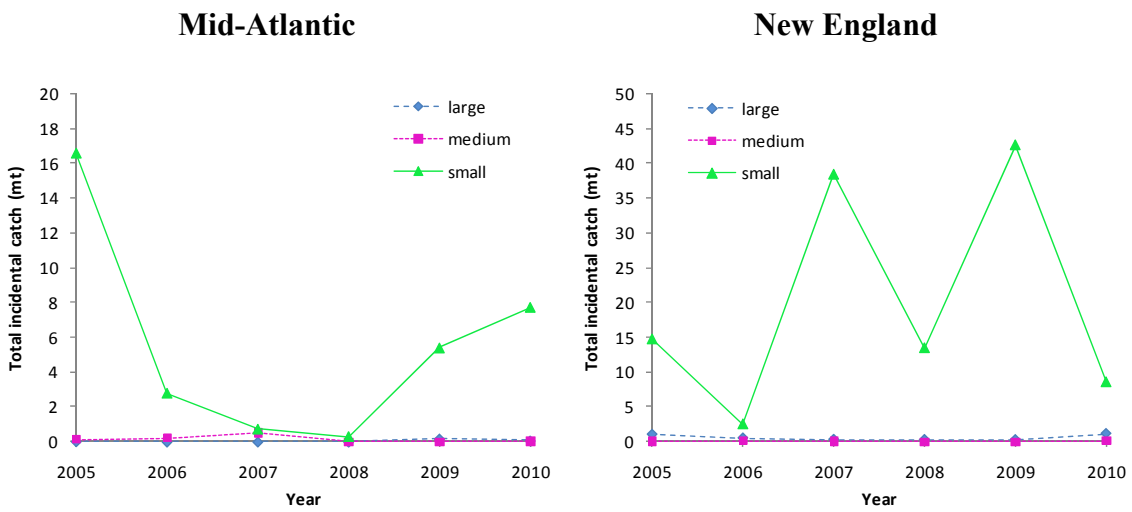


Figure 6: Blueback herring total incidental catch (mt) from 2005 – 2010 by region and bottom trawl mesh category.

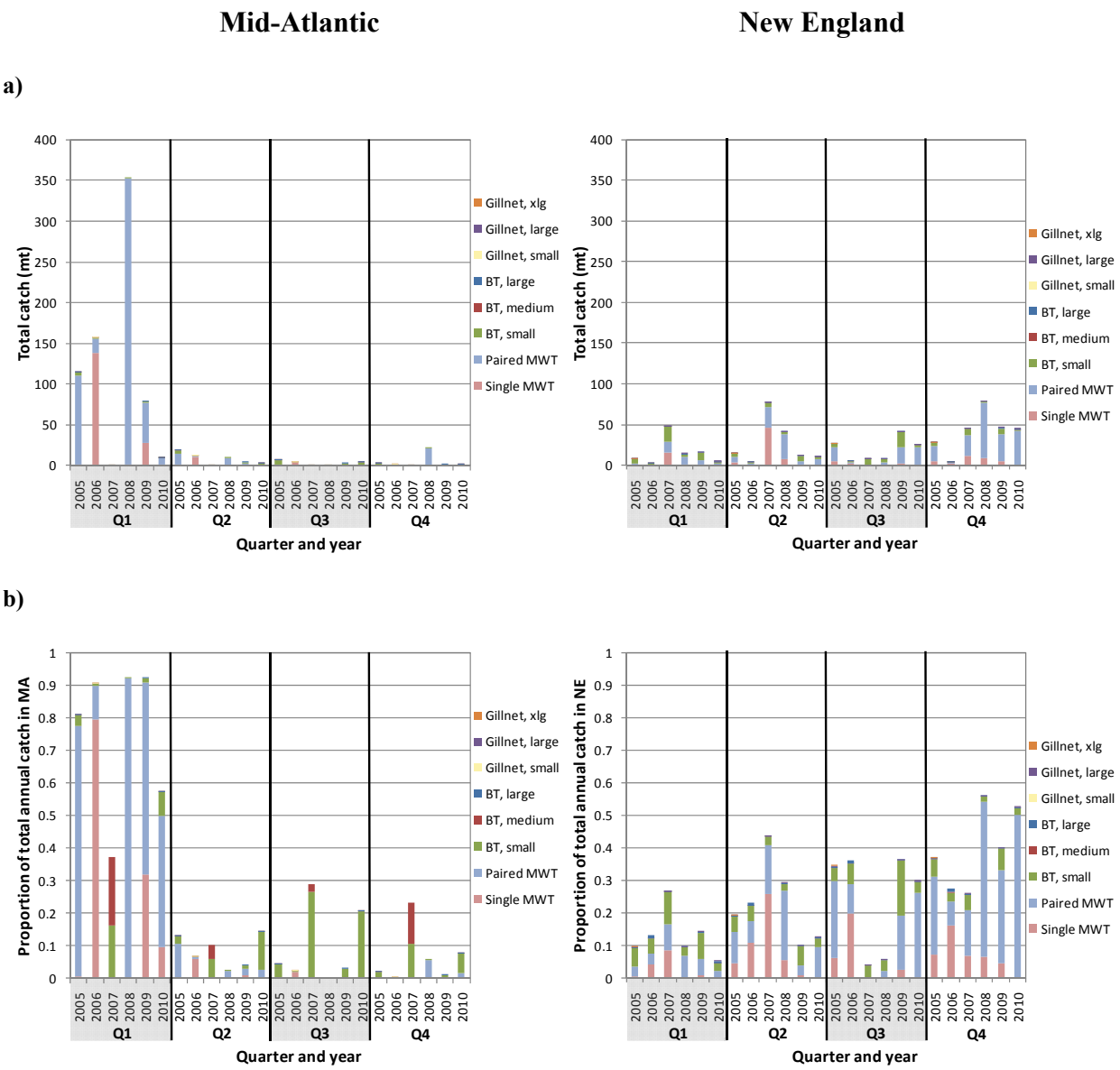


Figure 7: Blueback herring incidental catch (mt) by region and fleet (a) and the corresponding proportion of the total annual catch within each region and quarter (b).

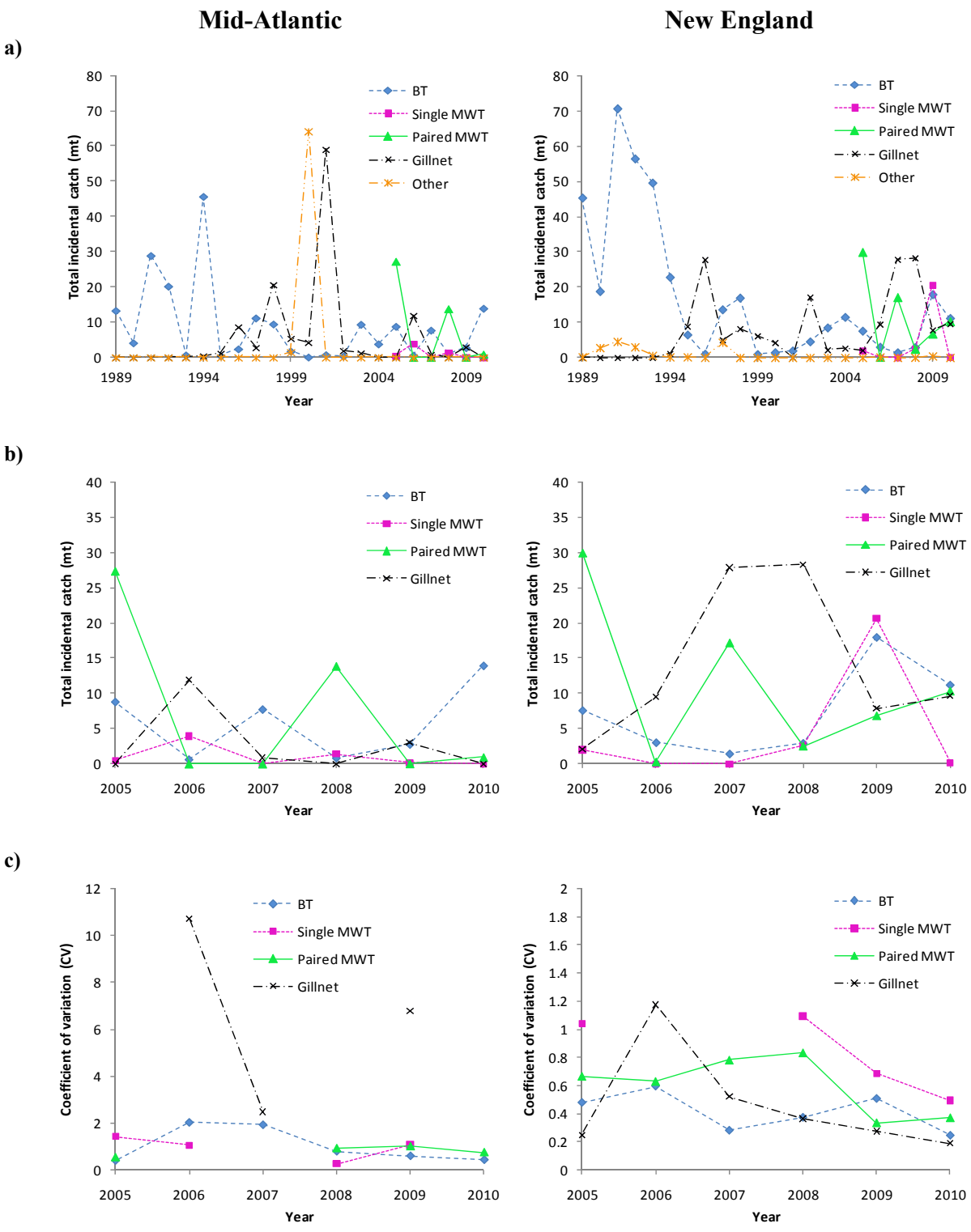


Figure 8: American shad total annual incidental catch (mt) by region for the four gears with the largest catches from a) 1989 – 2010 and b) 2005 – 2010, and c) the corresponding estimates of precision. Midwater trawl estimates are only included beginning in 2005.

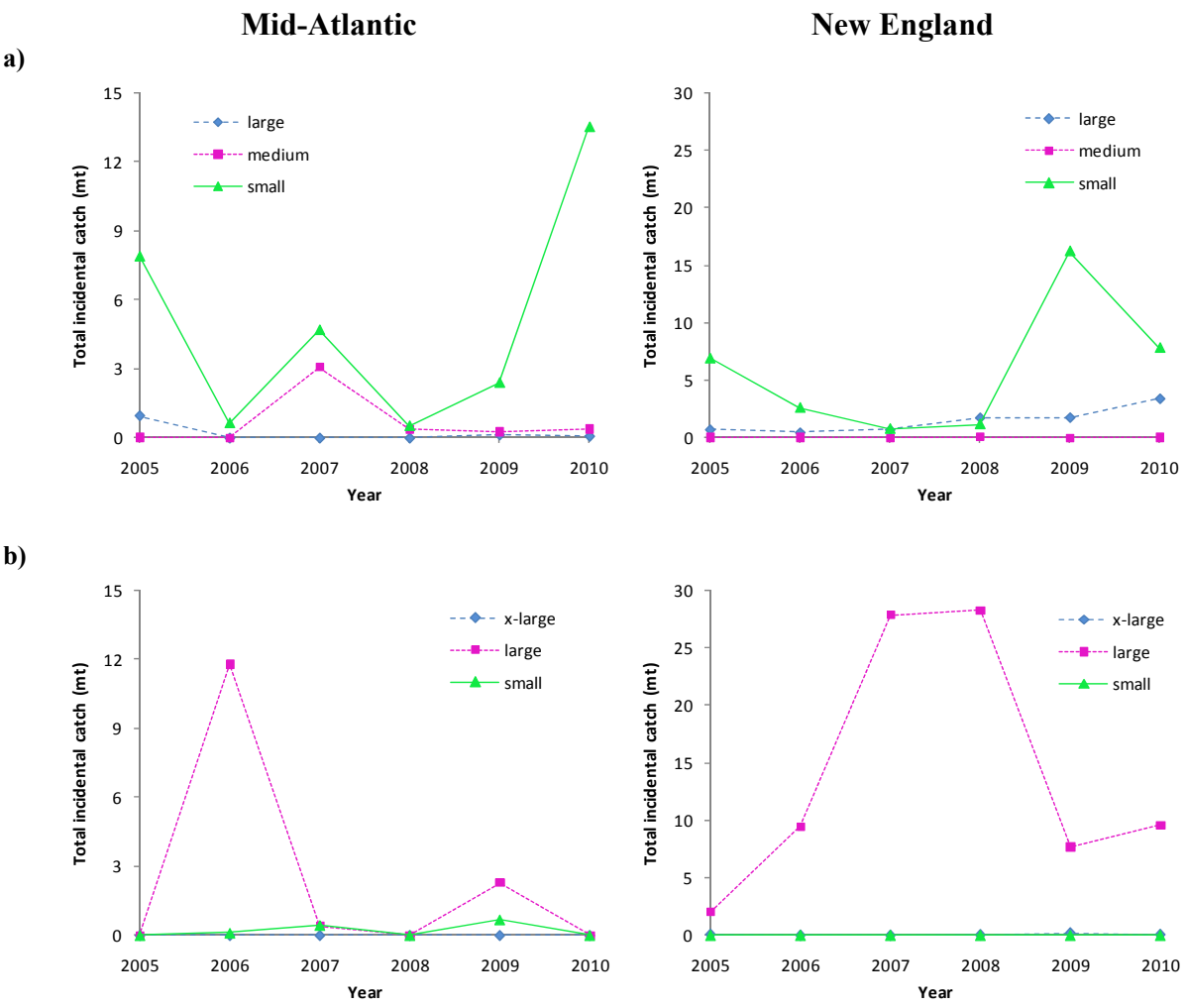


Figure 9: American shad total incidental catch (mt) from 2005 – 2010 by region and mesh category for a) bottom trawl and b) gillnet fleets.

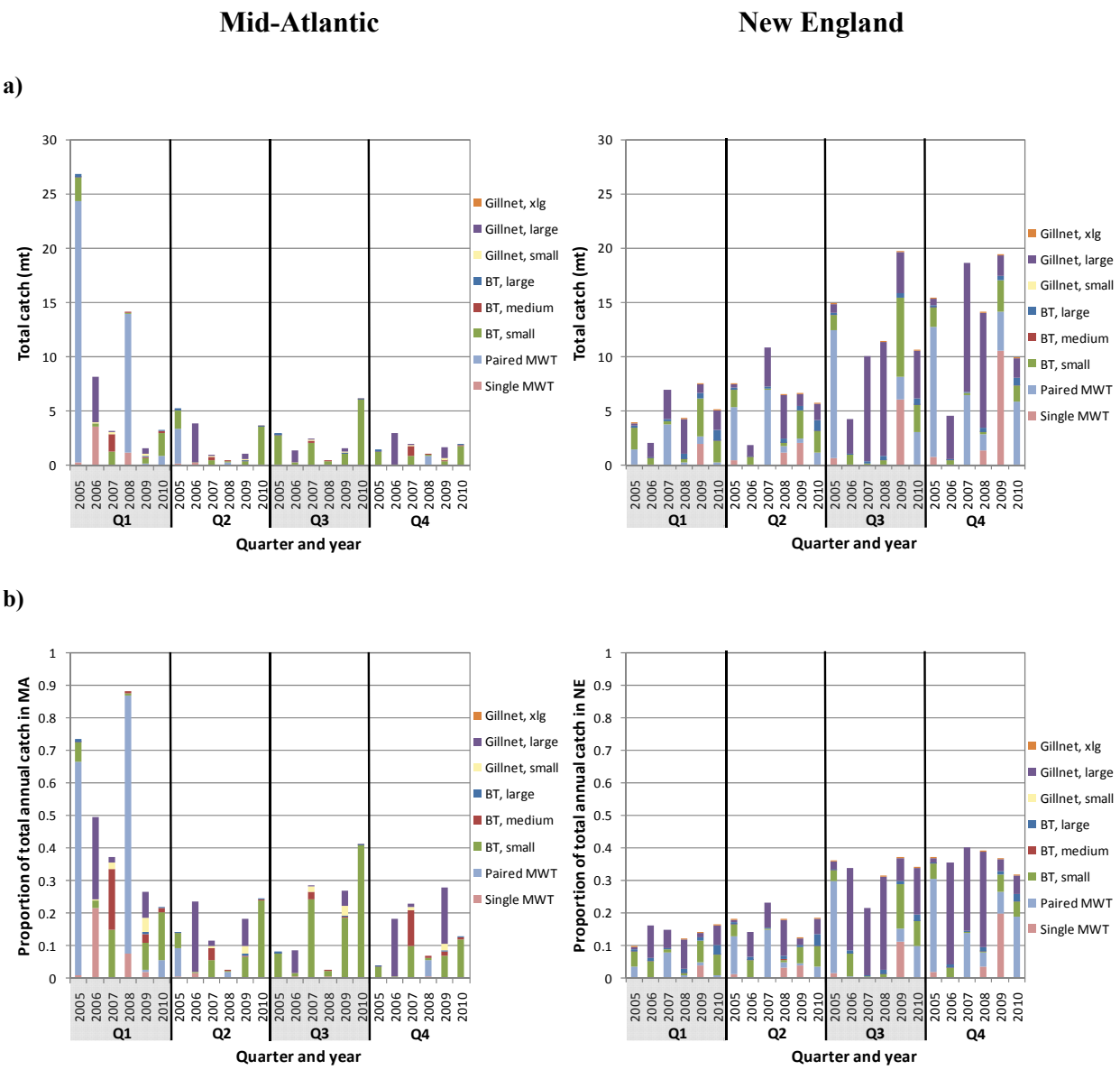


Figure 10: American shad quarterly incidental catch (mt) by region and fleet (a) and the corresponding proportion of the total annual catch within each region and quarter (b).

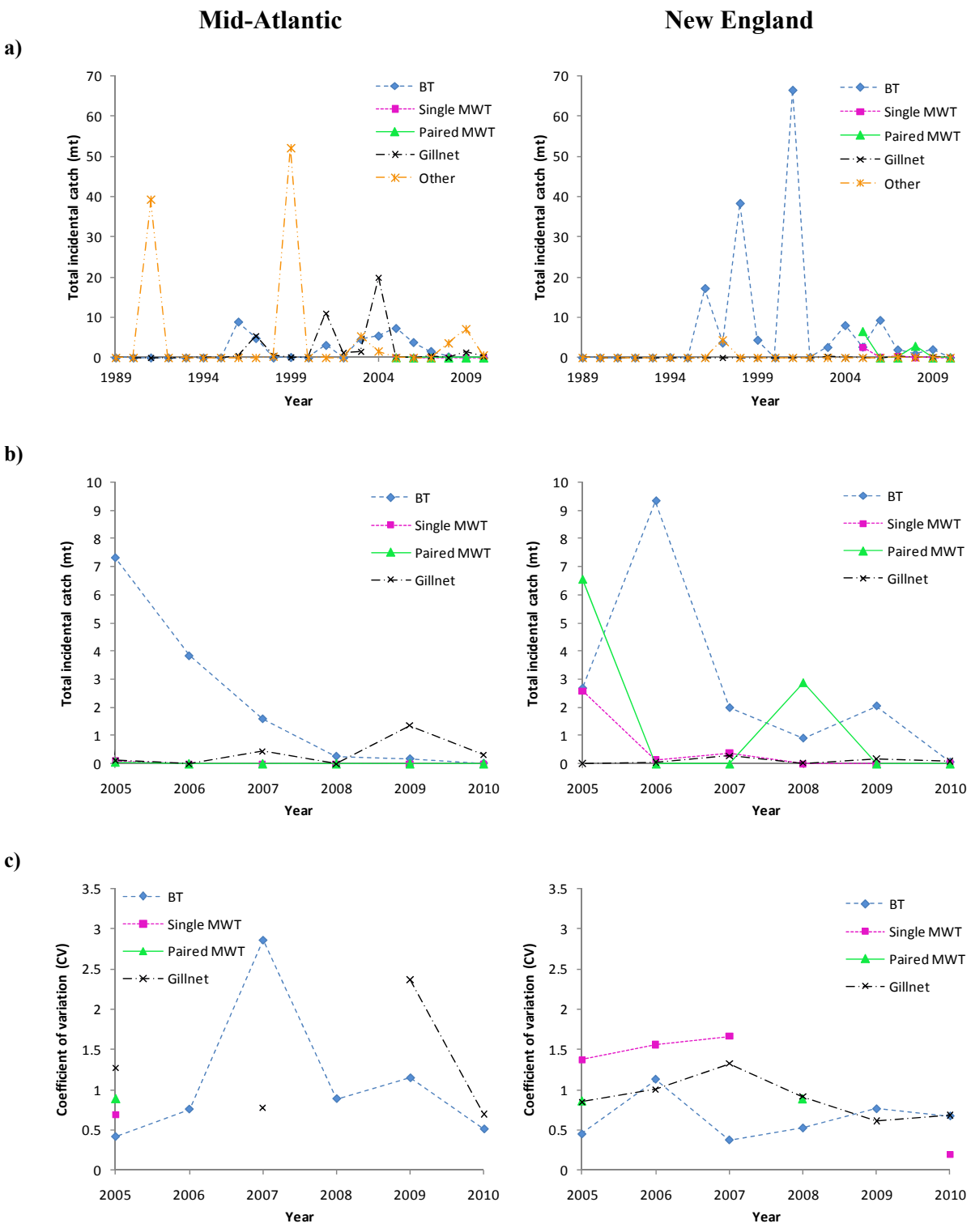


Figure 11: Hickory shad total annual incidental catch (mt) by region for the four gears with the largest catches from a) 1989 – 2010 and b) 2005 – 2010, and c) the corresponding estimates of precision. Midwater trawl estimates are only included beginning in 2005.

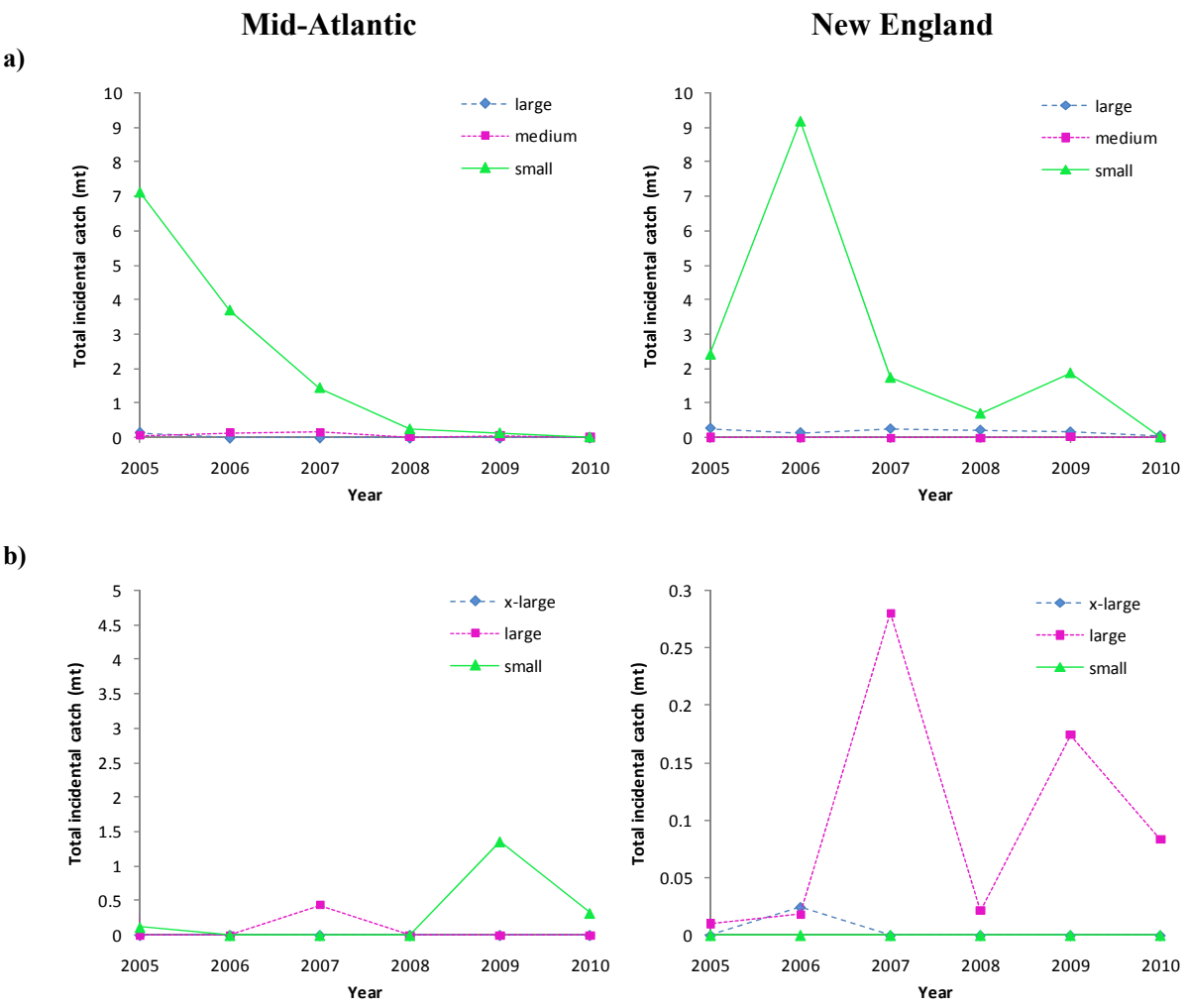


Figure 12: Hickory shad total incidental catch (mt) from 2005 – 2010 by region and mesh category for a) bottom trawl and b) gillnet fleets.

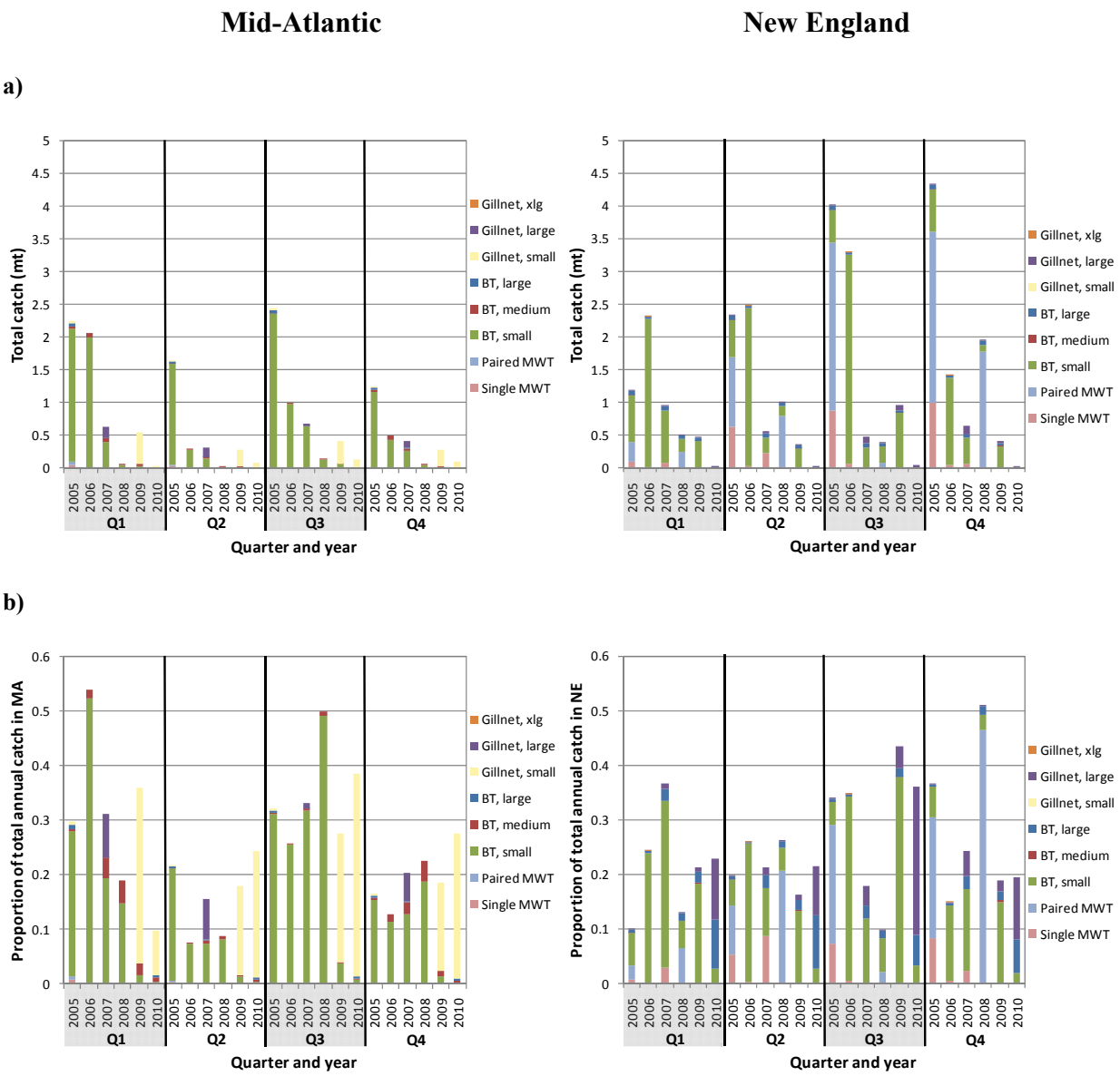


Figure 13: Hickory shad quarterly incidental catch (mt) by region and fleet (a) and the corresponding proportion of the total annual catch within each region and quarter (b).

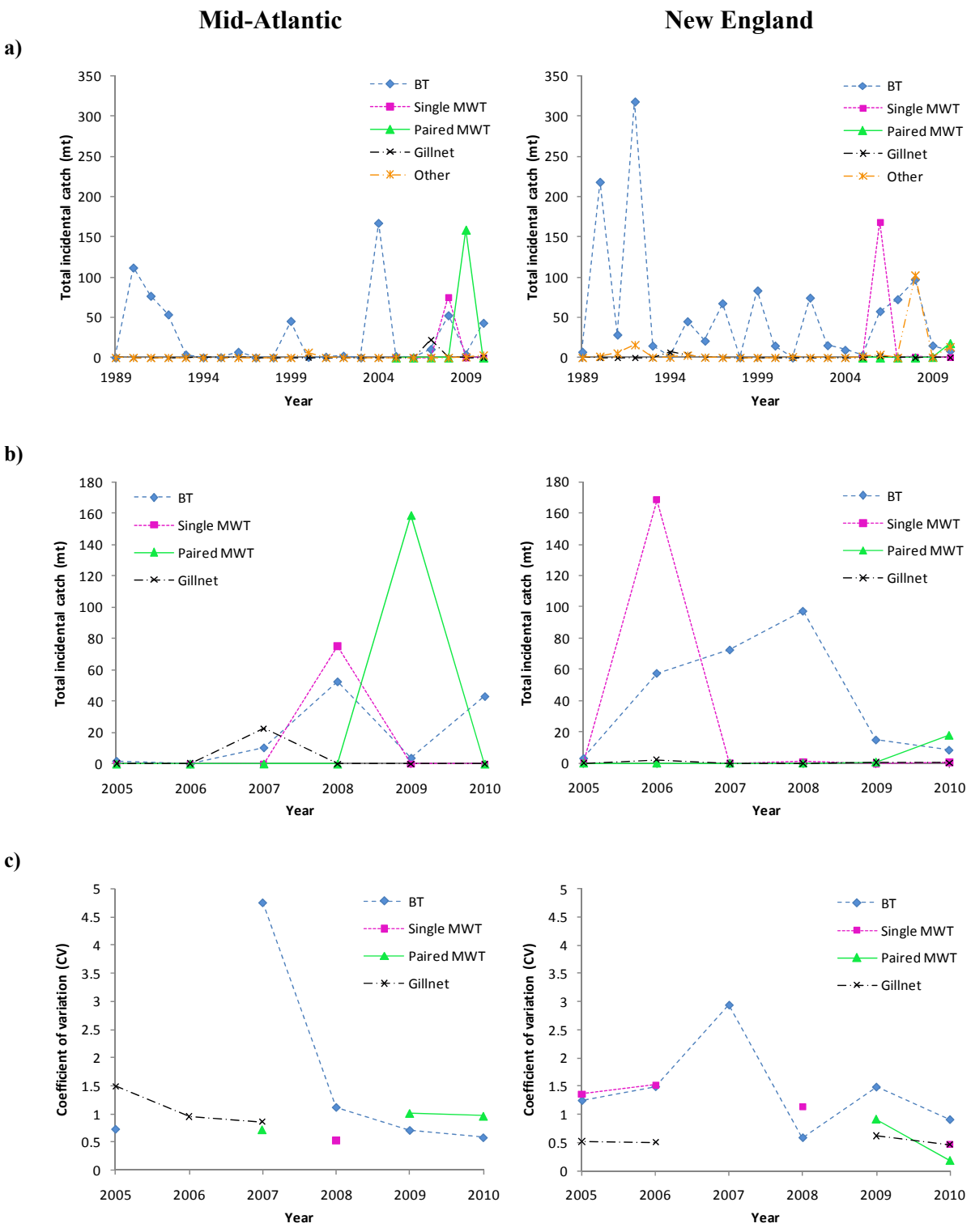


Figure 14: Unknown herring total annual incidental catch (mt) by region for the four gears with the largest catches from a) 1989 – 2010 and b) 2005 – 2010, and c) the corresponding estimates of precision. Midwater trawl estimates are only included beginning in 2005.

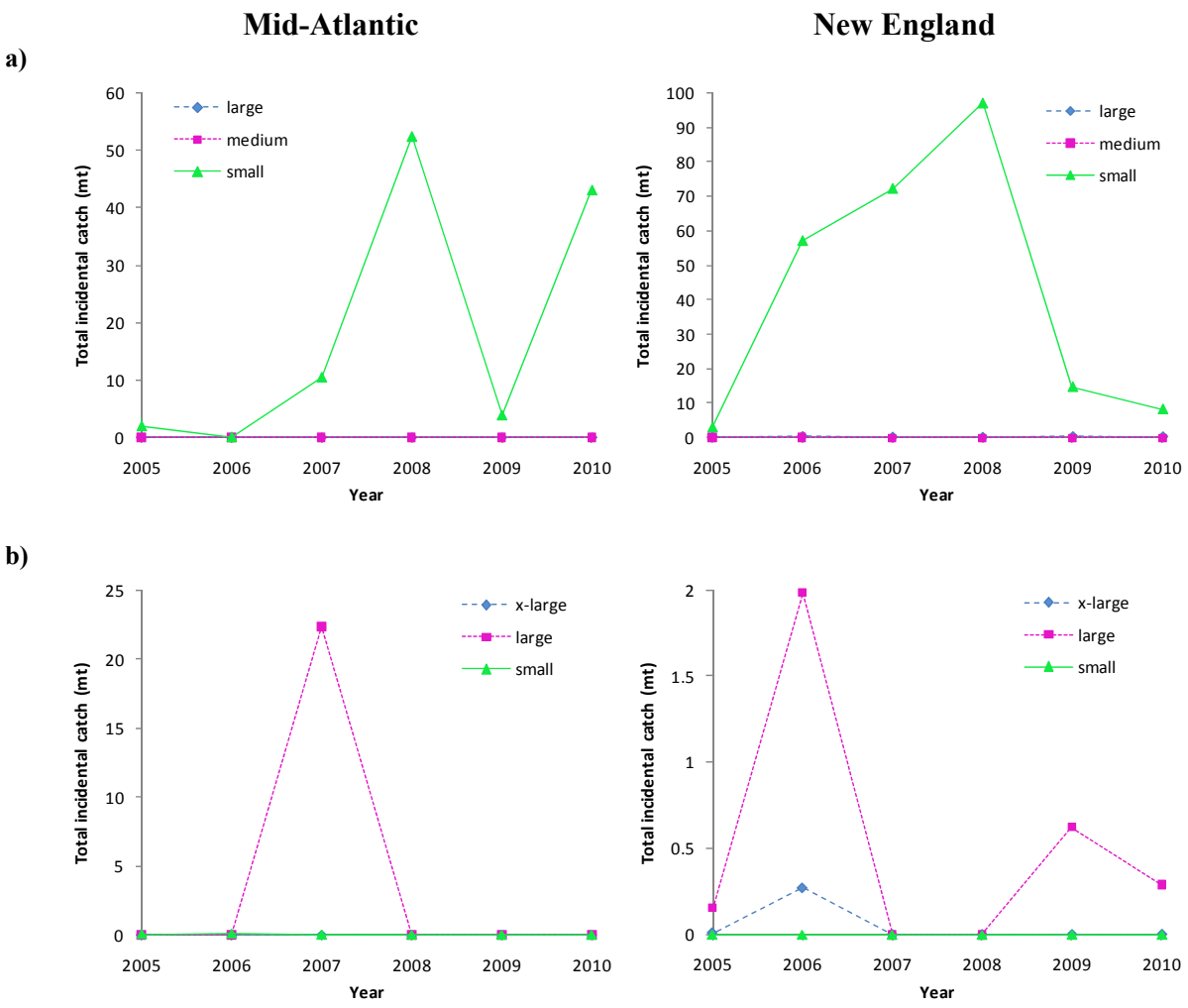


Figure 15: Unknown herring total incidental catch (mt) from 2005 – 2010 by region and mesh category for a) bottom trawl and b) gillnet fleets.

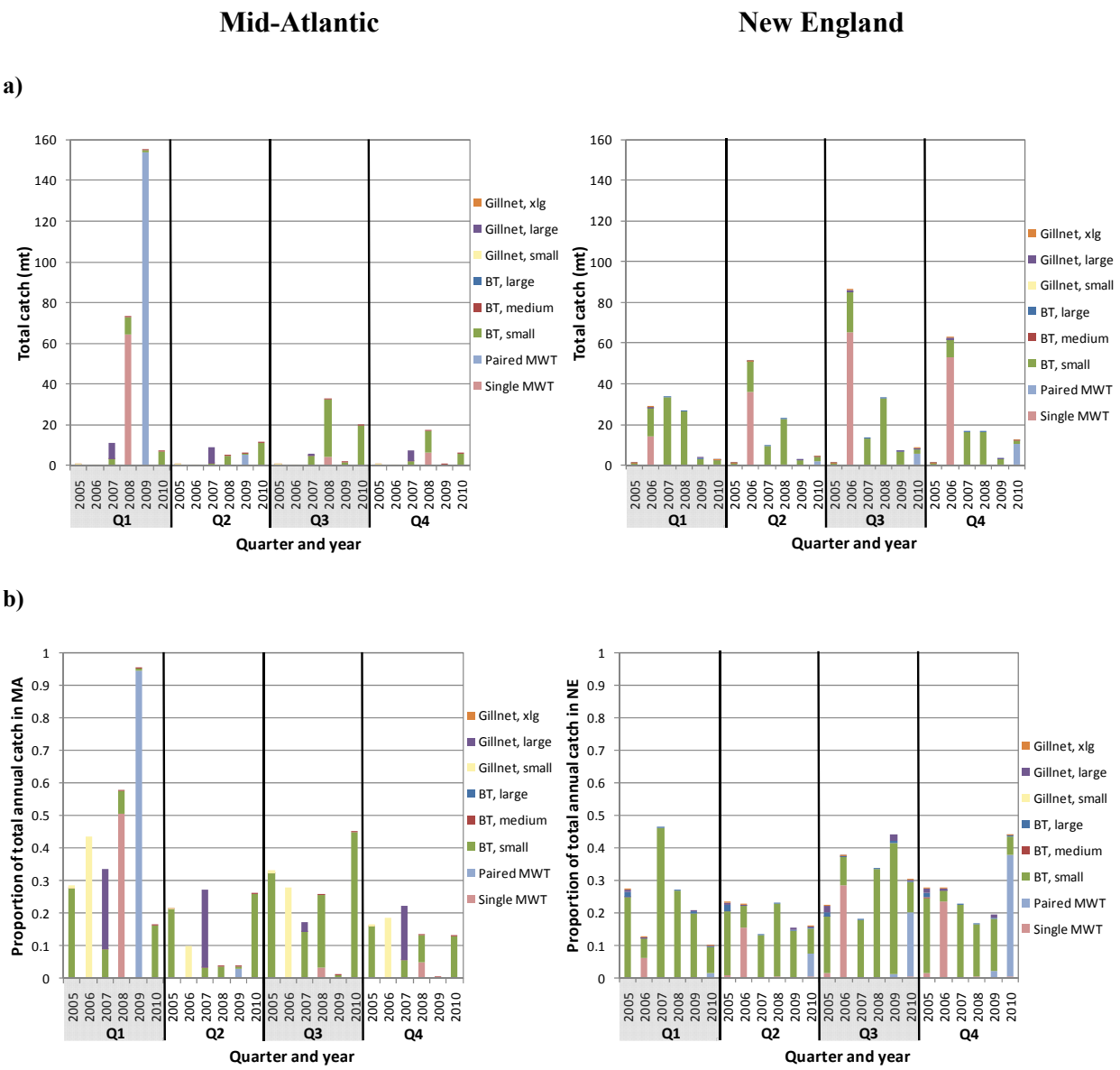


Figure 16: Unknown herring quarterly incidental catch (mt) by region and fleet (a) and the corresponding proportion of the total annual catch within each region and quarter (b).

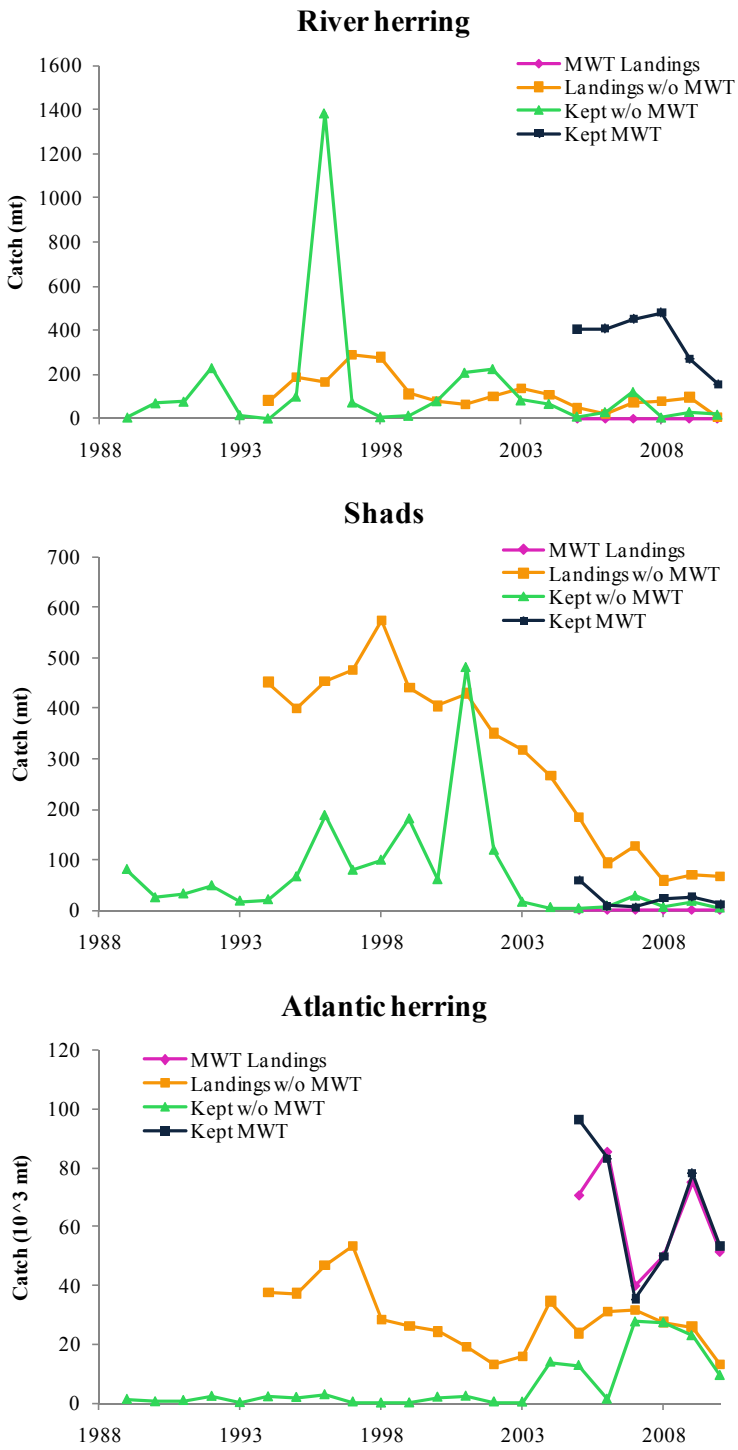
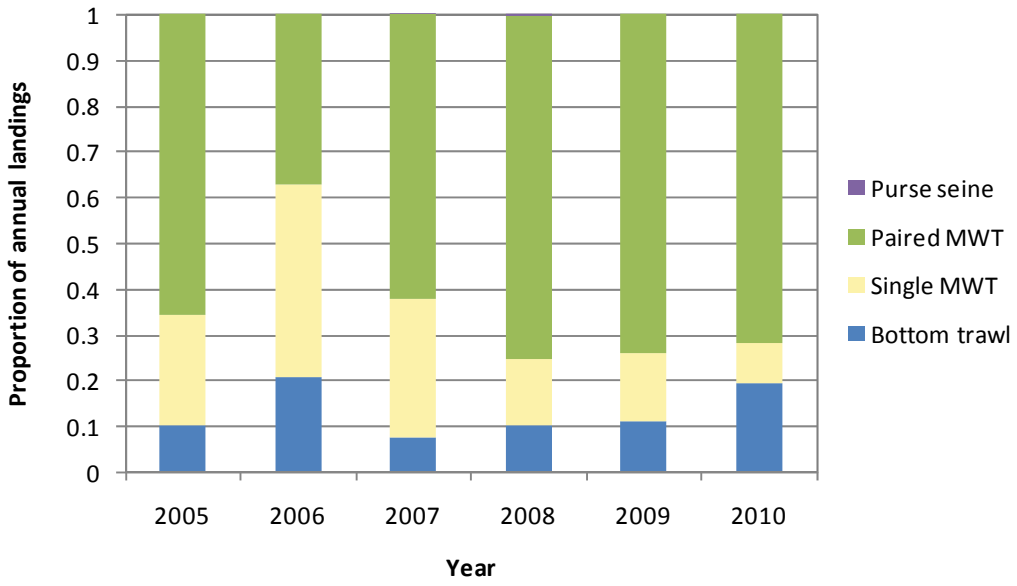


Figure 17: Comparison of landings obtained from the dealer database to the amount kept, quantified as the difference between total incidental catch and discards, for river herring (alewife and blueback herring), shad species (hickory and American shad) and Atlantic herring. Midwater trawl estimates are only included beginning in 2005. This validation exercise was conducted in a preliminary run where gear was not split into mesh categories.

a)



b)

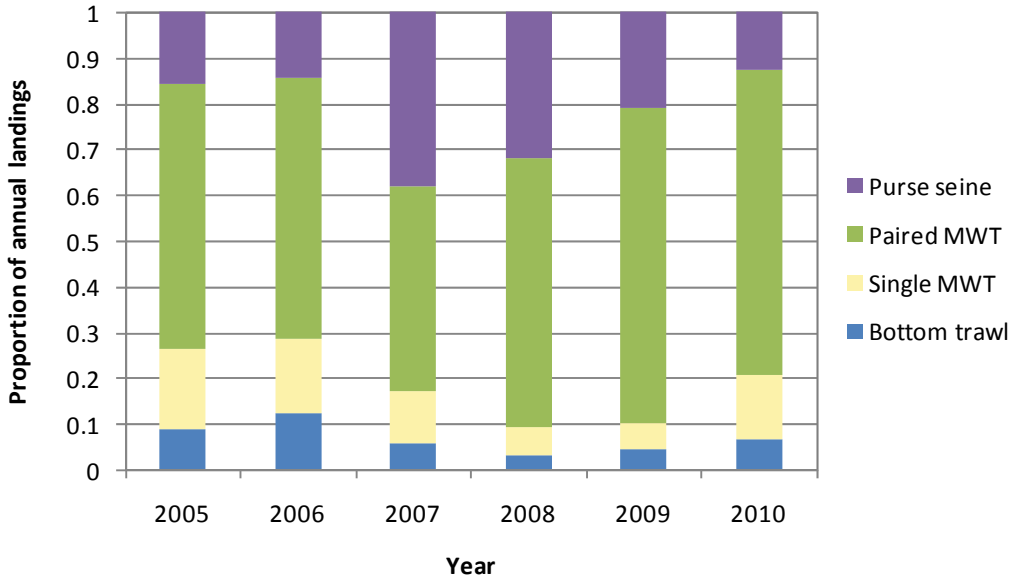
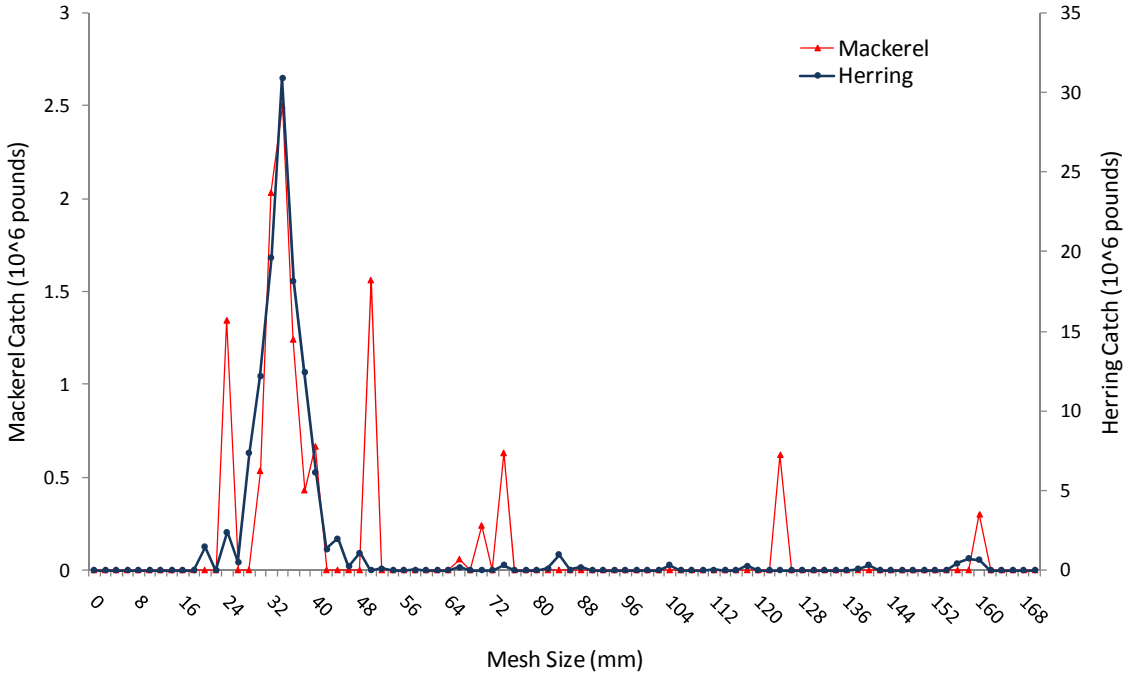


Figure 18: Distribution of a) mackerel and b) herring landings across gear from 2005 - 2010. Gears included in the analysis were purse seine, paired midwater trawls, single midwater trawls and bottom trawls. It was assumed that these gears represented the majority of both mackerel and herring landings.

a)



b)

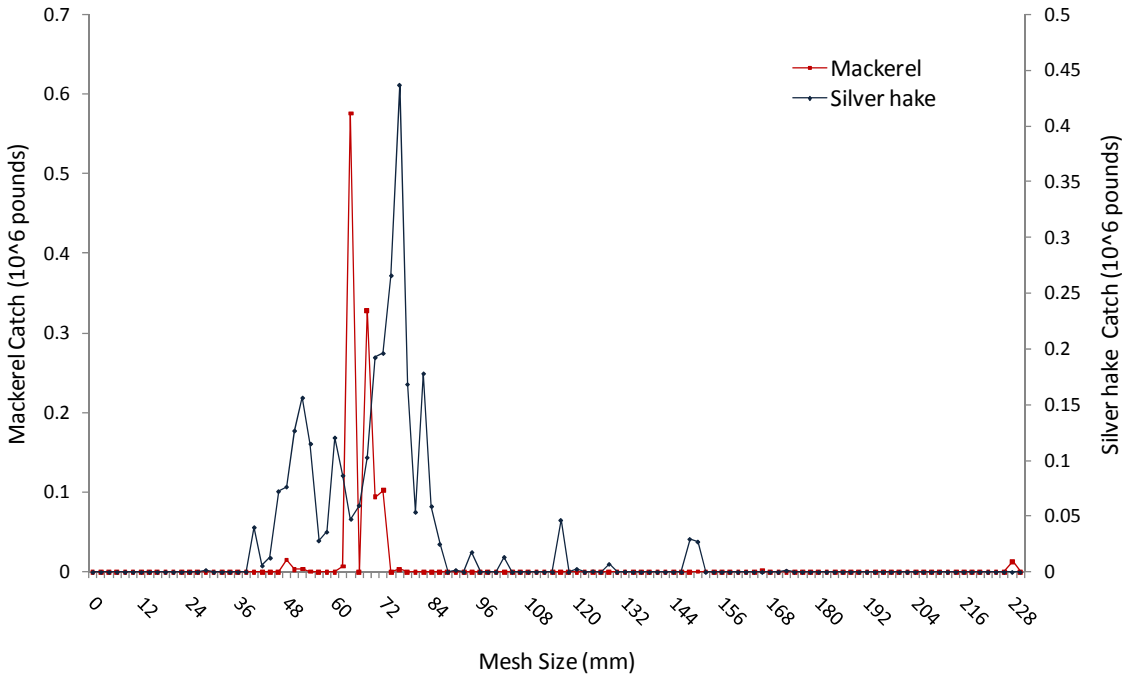
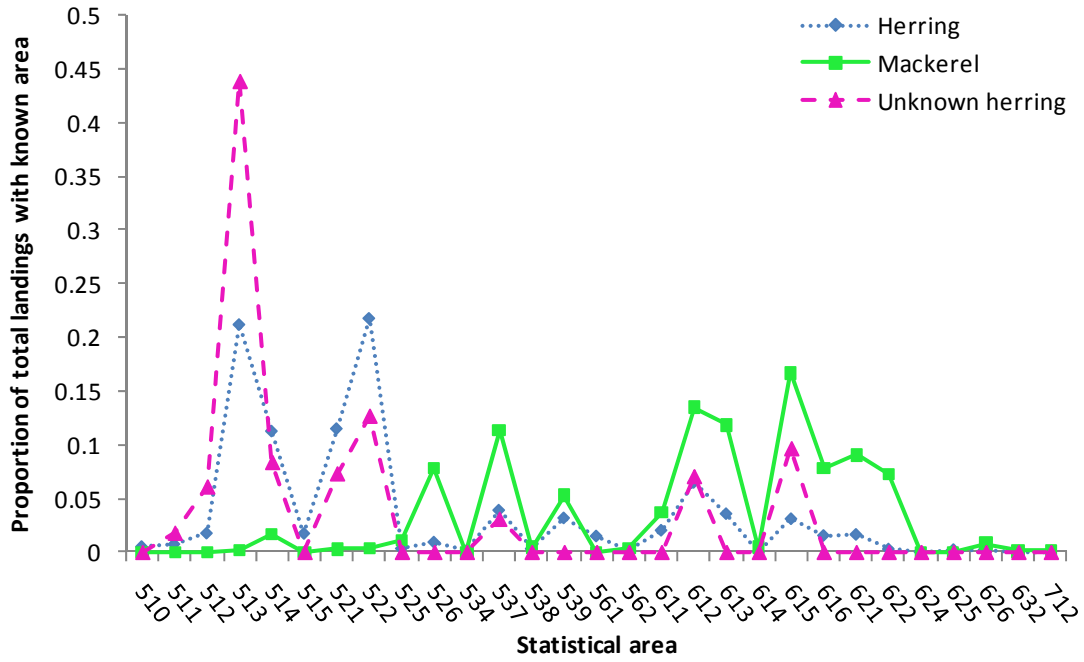


Figure 19: Mackerel and herring midwater trawl landings (a) and mackerel and silver hake bottom trawl landings (b) by mesh size from 2005 – 2010.

a)



b)

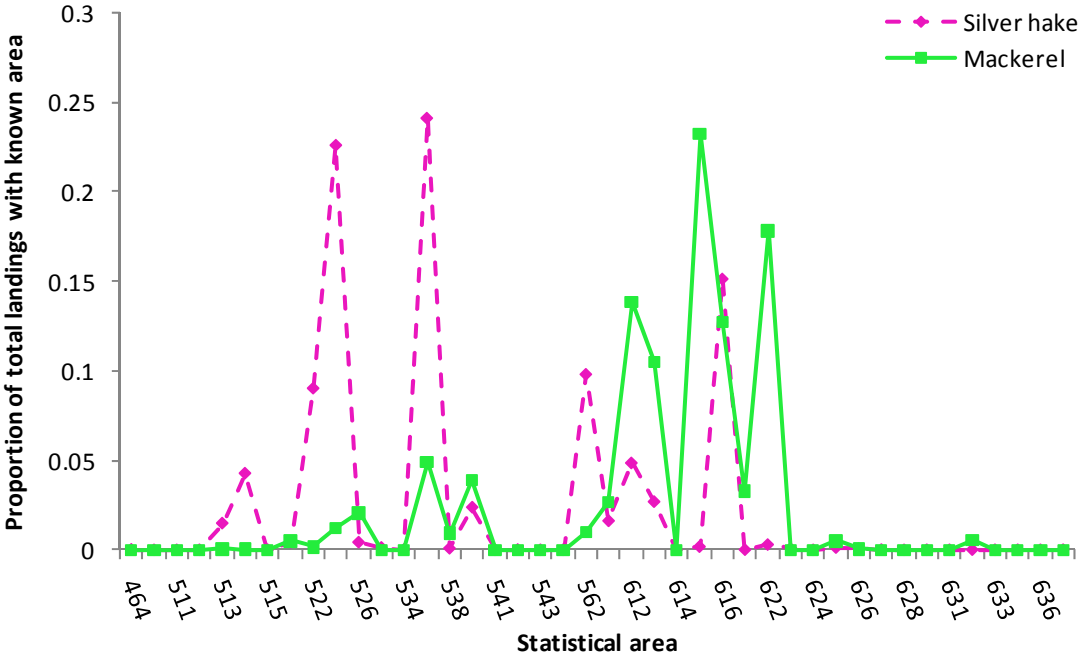


Figure 20: Proportion of species-specific midwater trawl (a) and bottom trawl (b) landings by statistical area from 2005 - 2010.

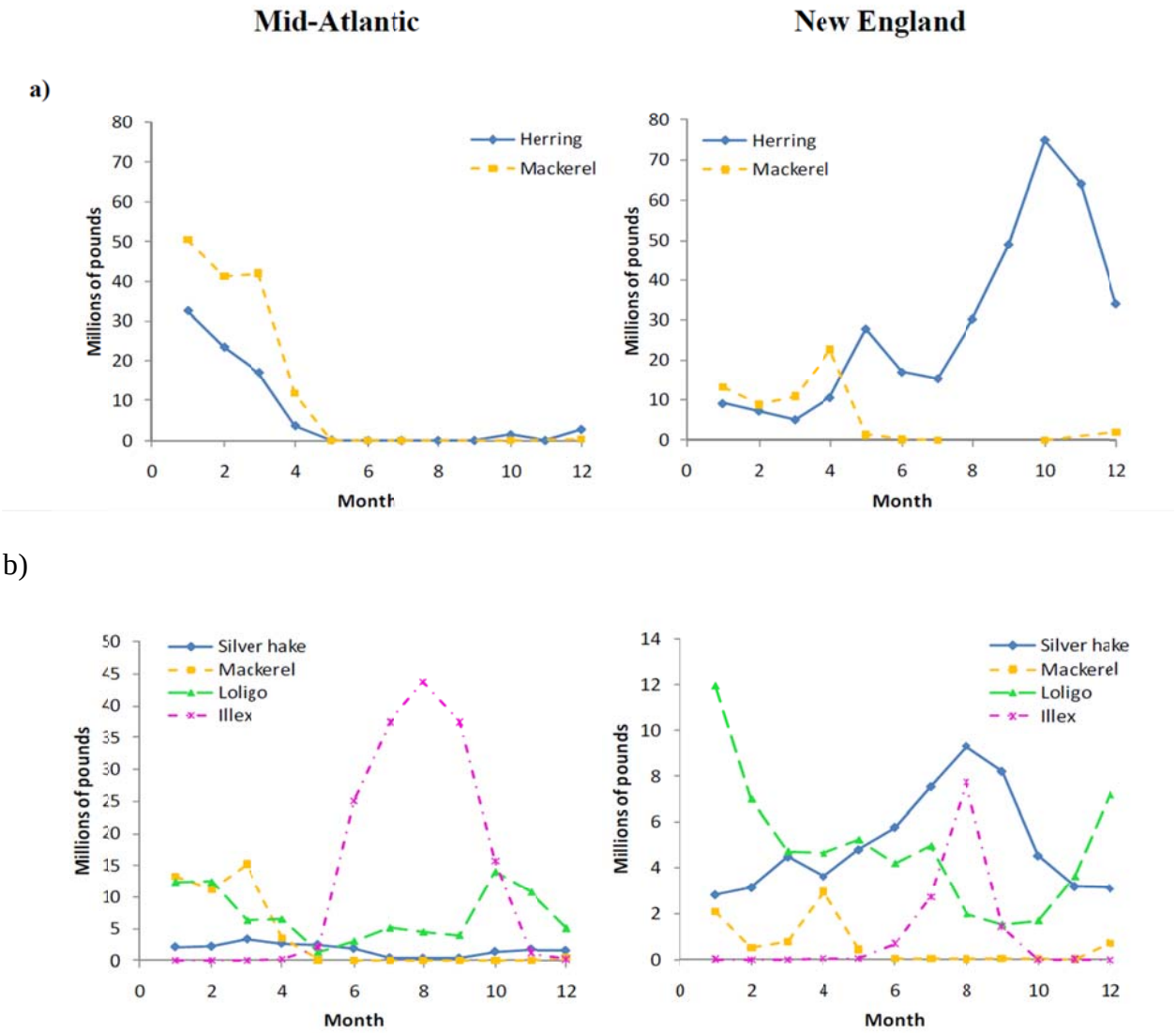
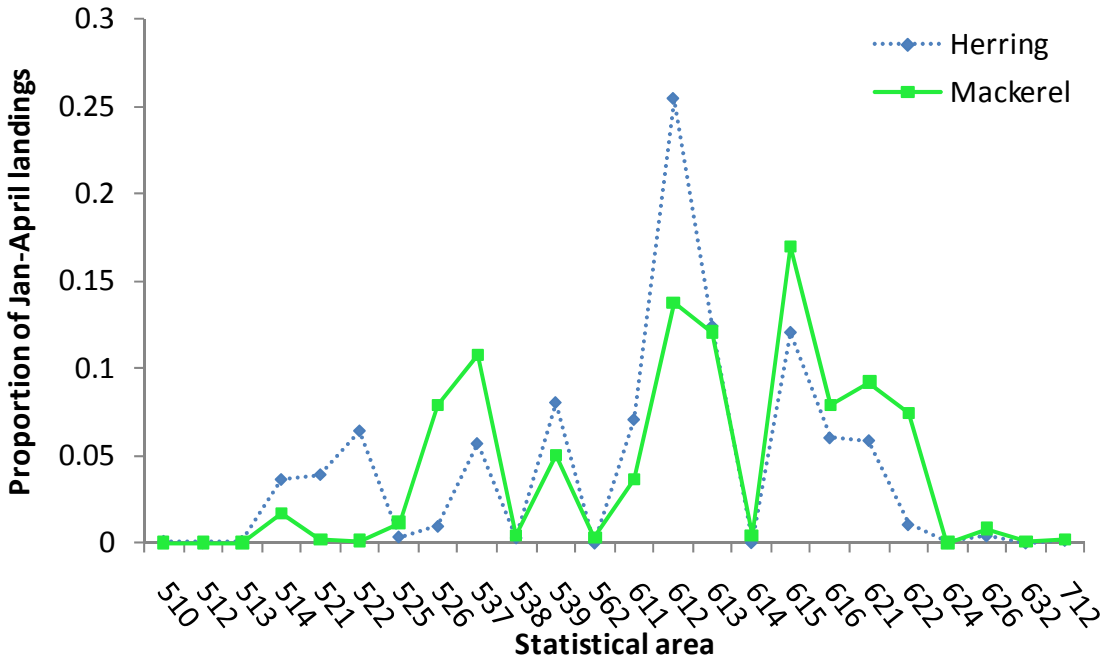


Figure 21: Species-specific midwater trawl (a) and bottom trawl (b) landings (millions of pounds) by month and region from 2005 - 2010.

a)



b)

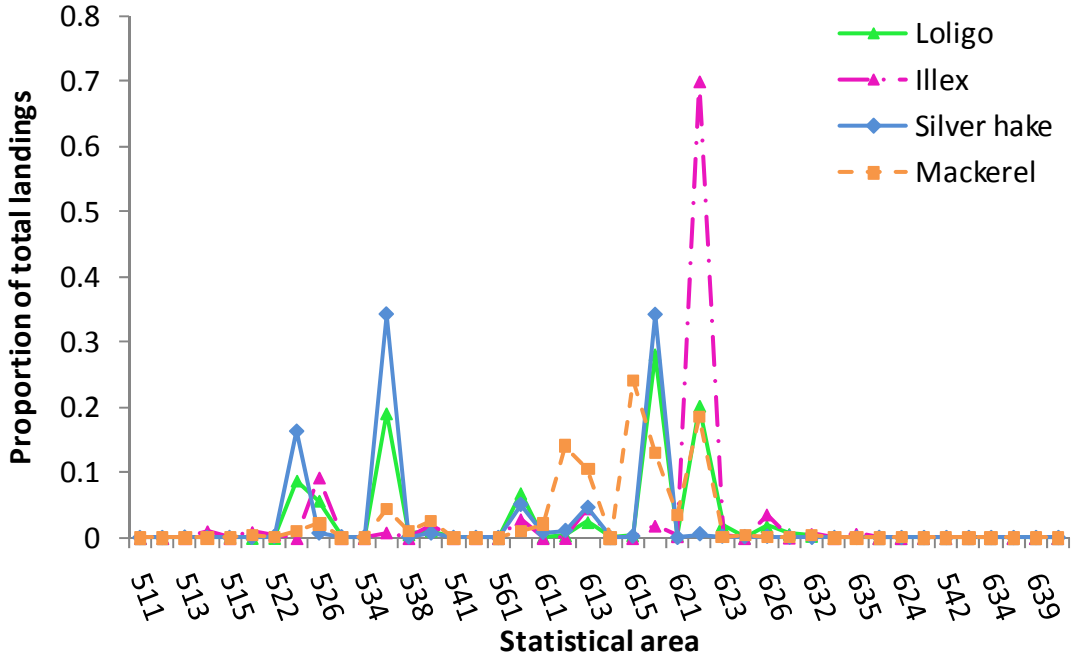


Figure 22: Proportion of January – April species-specific midwater trawl (a) and bottom trawl (b) landings by statistical area from 2005 - 2010.

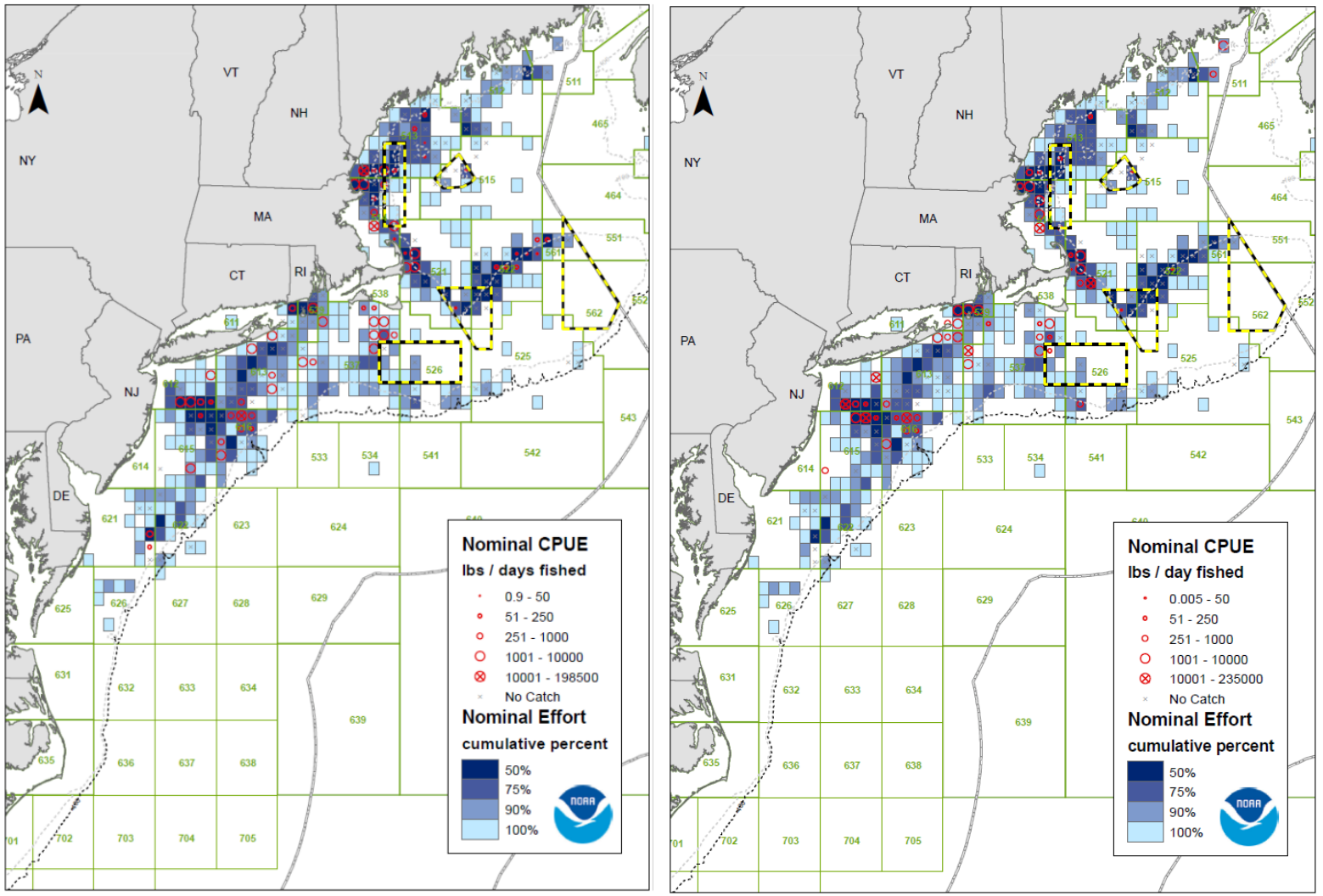


Figure 23. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the paired midwater trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife (left) and blueback (right), by ten-minute square, during 2005-2010.

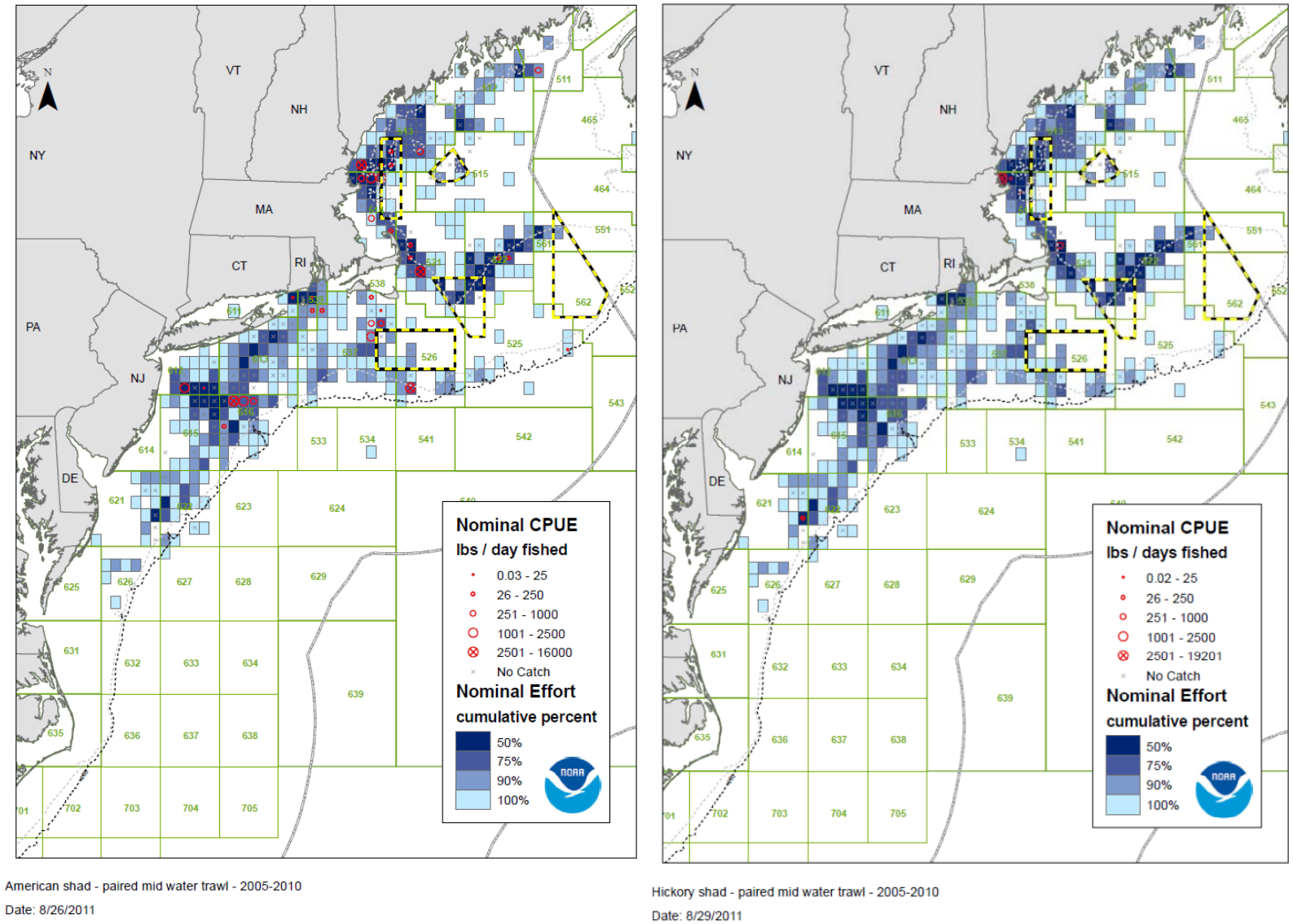


Figure 24. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the paired midwater trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of American shad (left) and hickory shad (right), by ten-minute square, during 2005-2010.

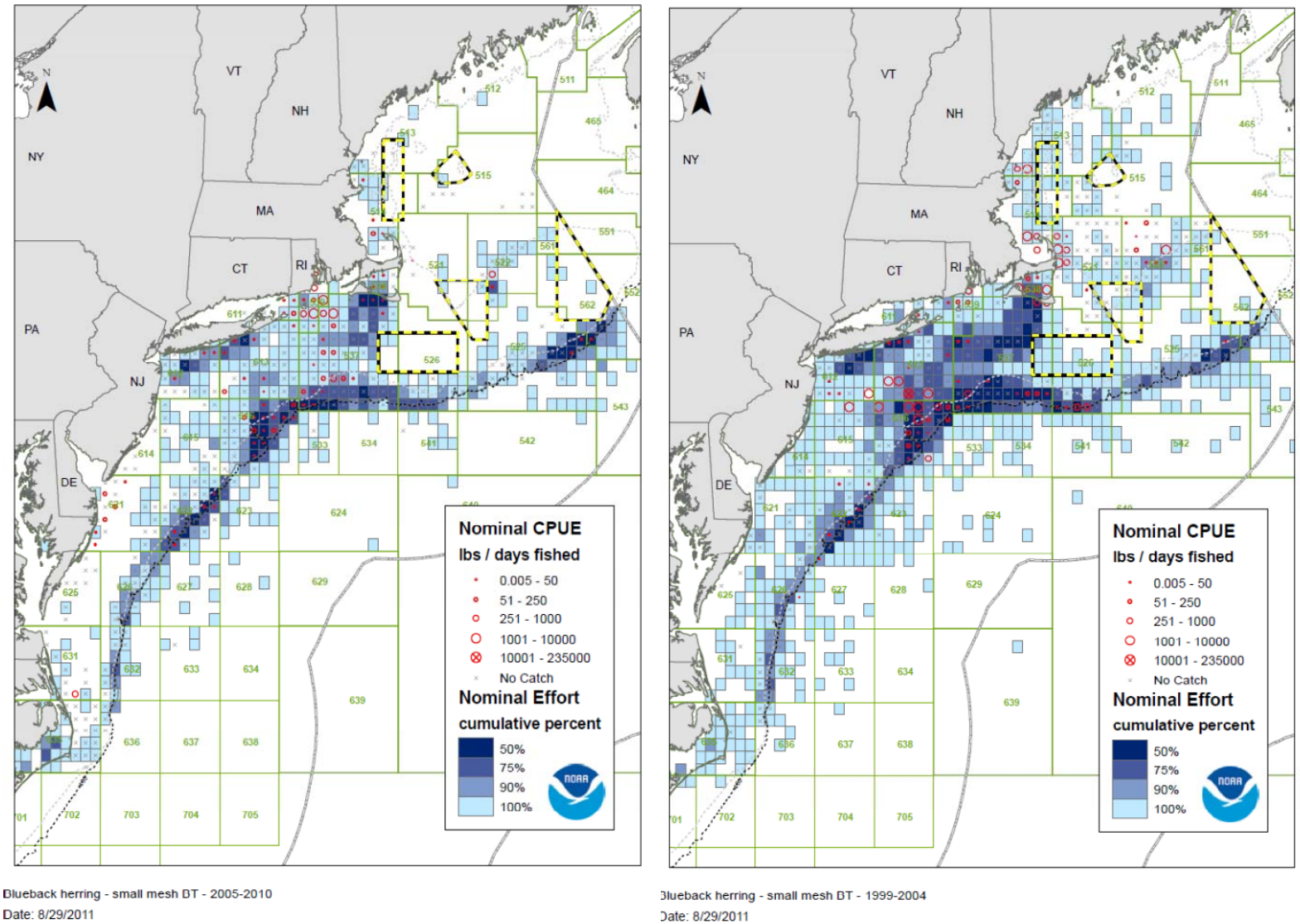
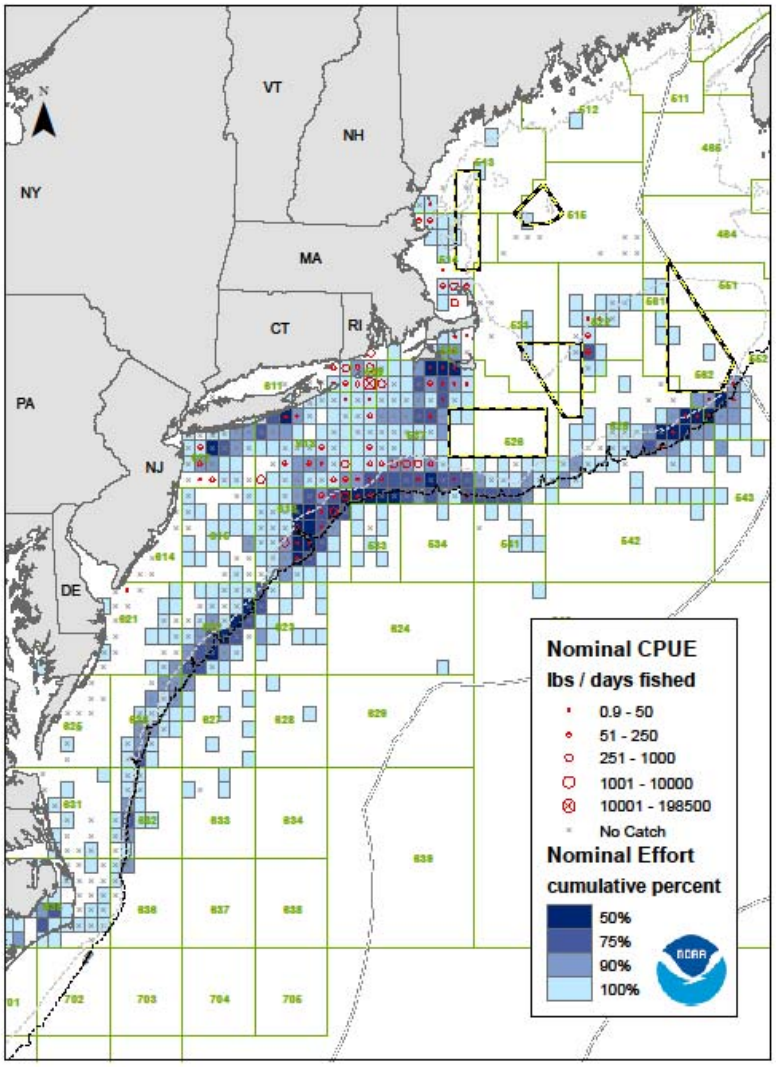


Figure 25. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of blueback herring, by ten-minute square, during 2005-2010 and 1999-2004.



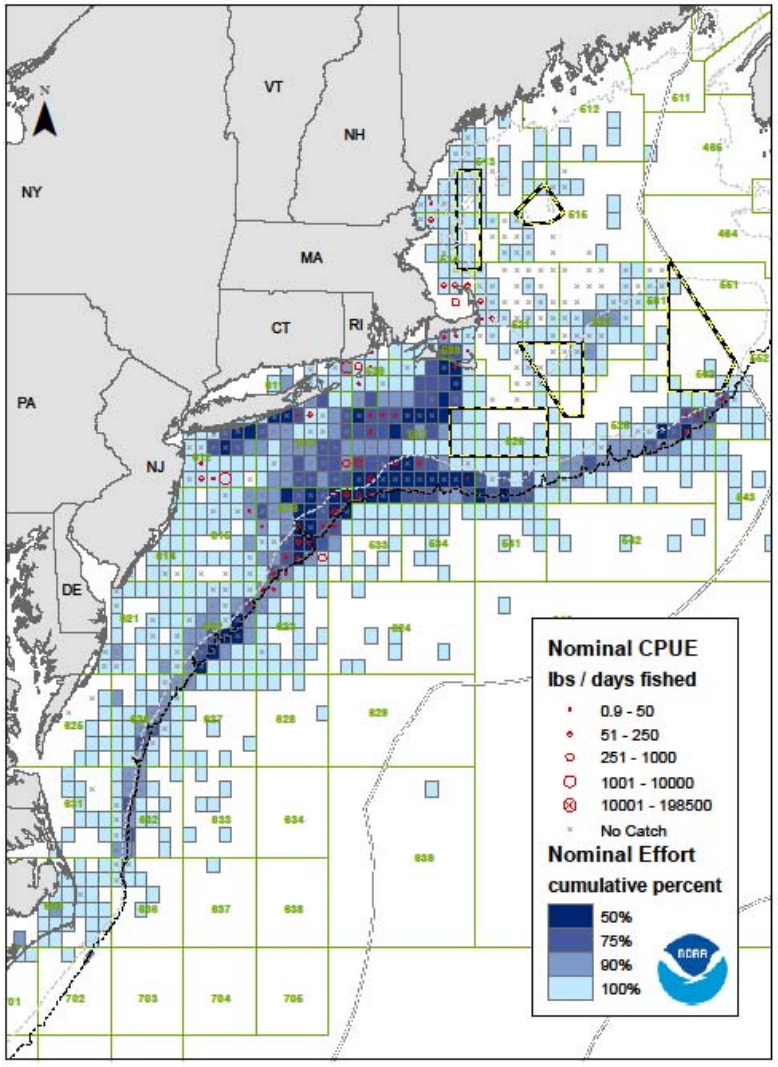


Figure 26. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, by ten-minute square, during 2005-2010 and 1999-2004.

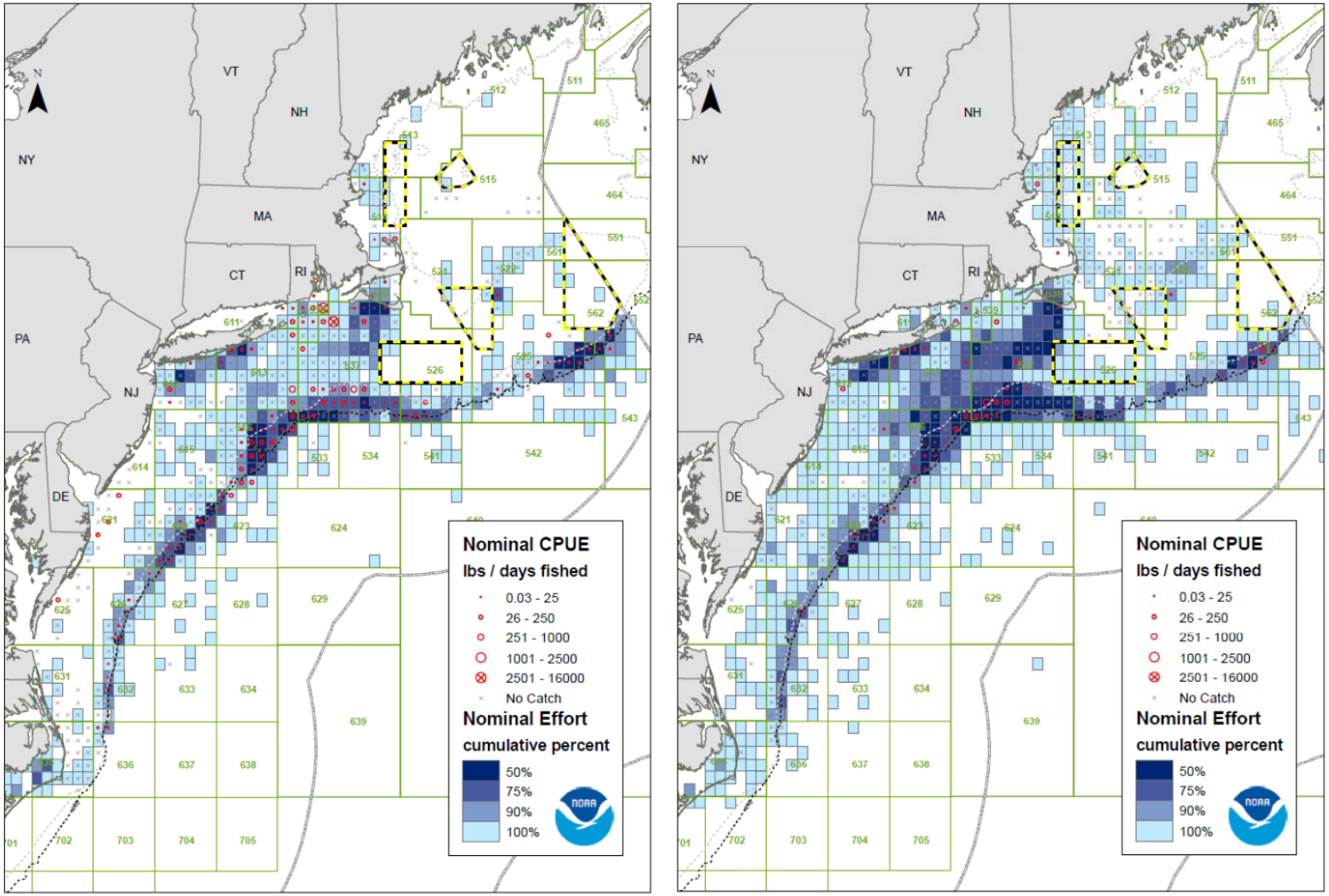


Figure 27. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of American shad, by ten-minute square, during 2005-2010 and 1999-2004.

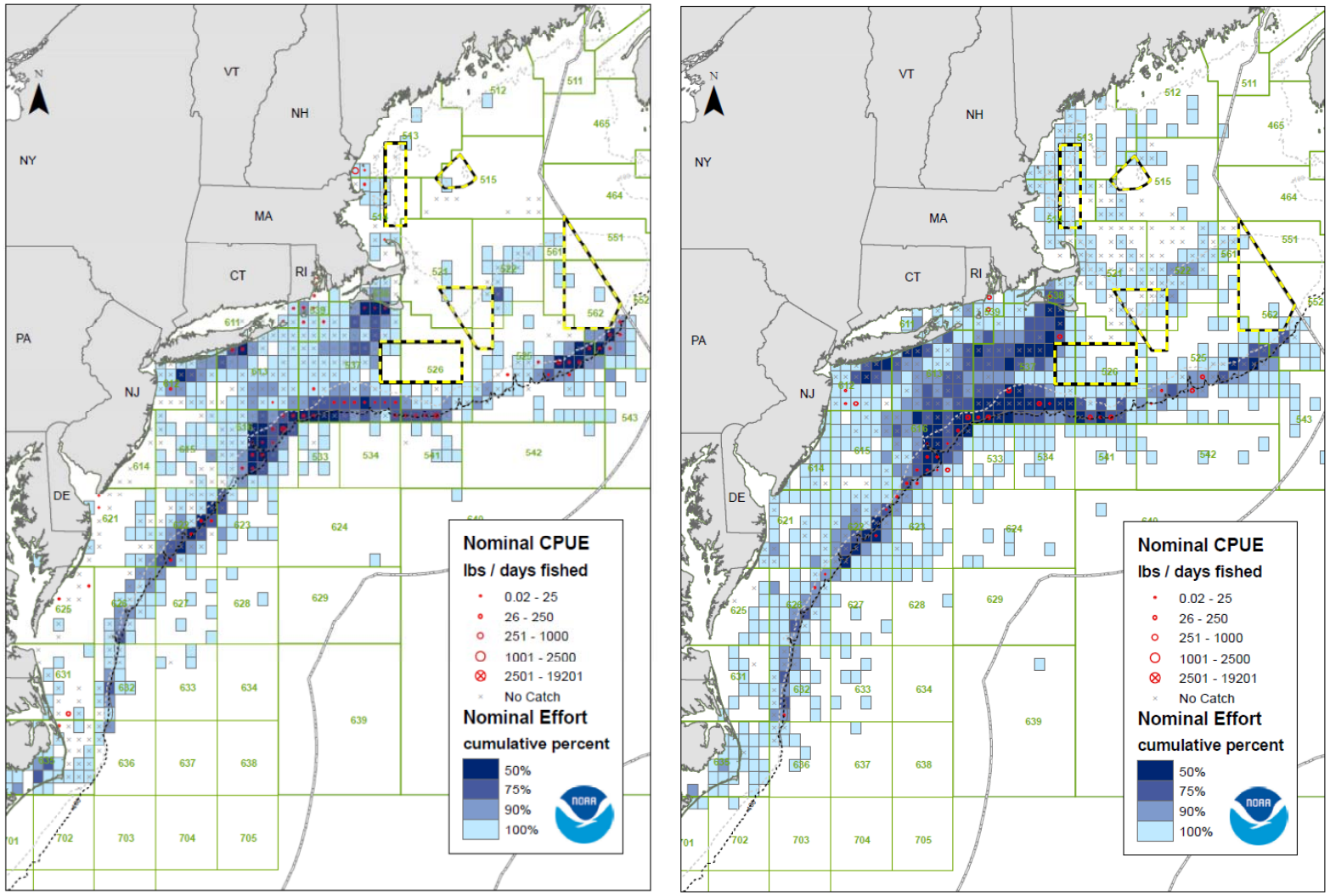


Figure 28. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of hickory shad, by ten-minute square, during 2005-2010 and 1999-2004.

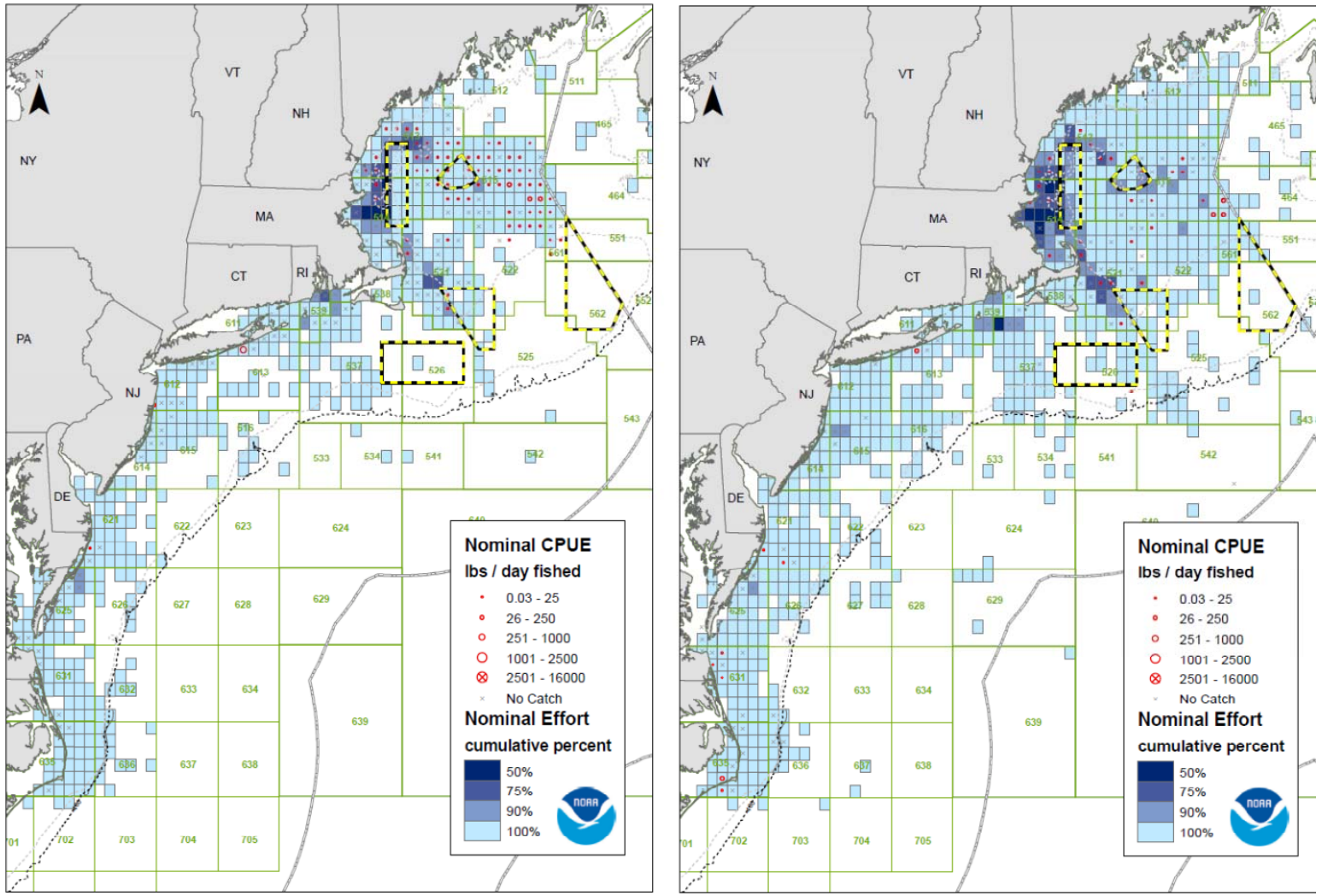


Figure 29. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the large mesh (mesh 5.50-7.99 in.) gillnet fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of American shad, by ten-minute square, during 2005-2010 and 1999-2004.

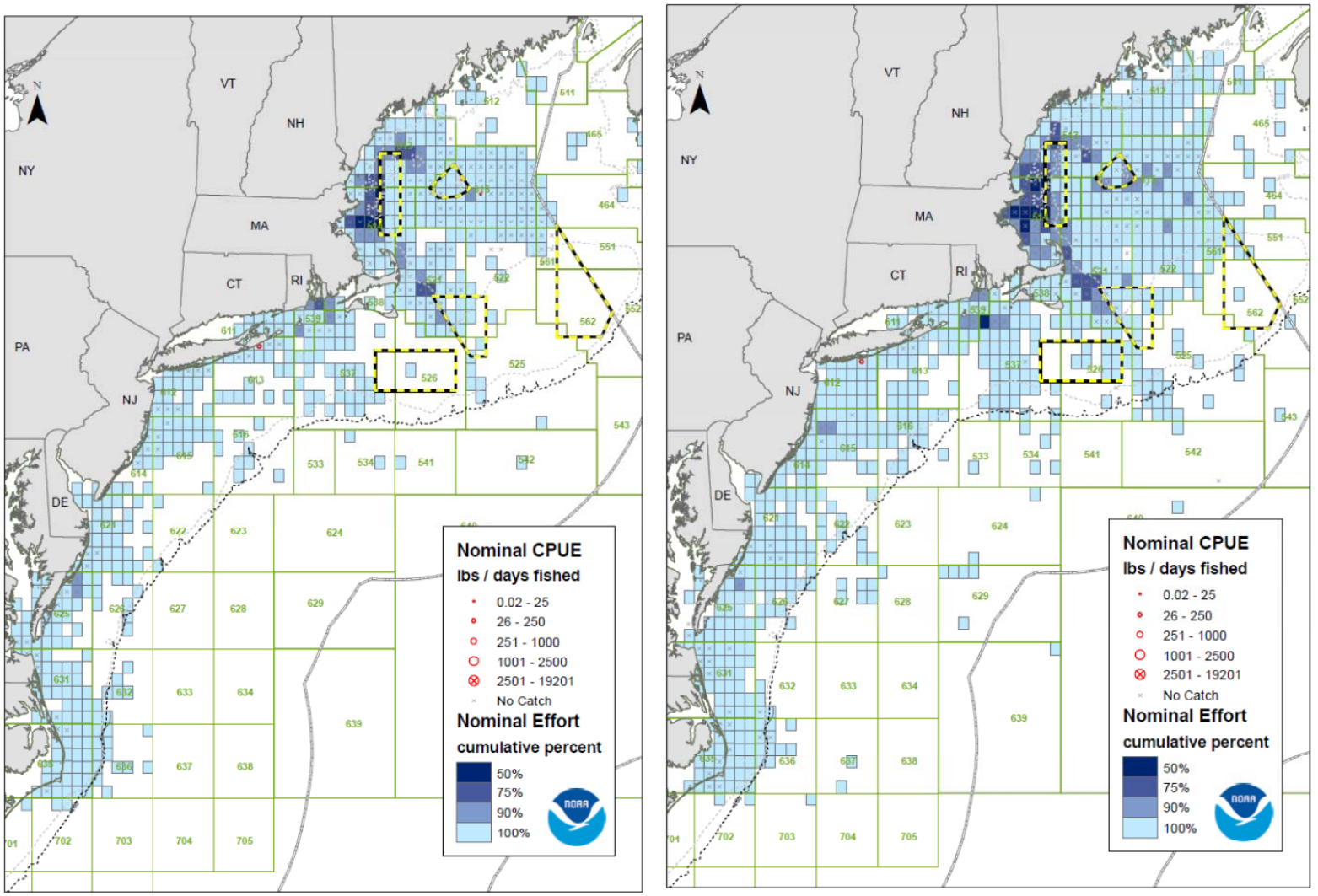


Figure 30. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the large mesh (mesh 5.50-7.99 in.) gillnet fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of hickory shad, by ten-minute square, during 2005-2010 and 1999-2004.

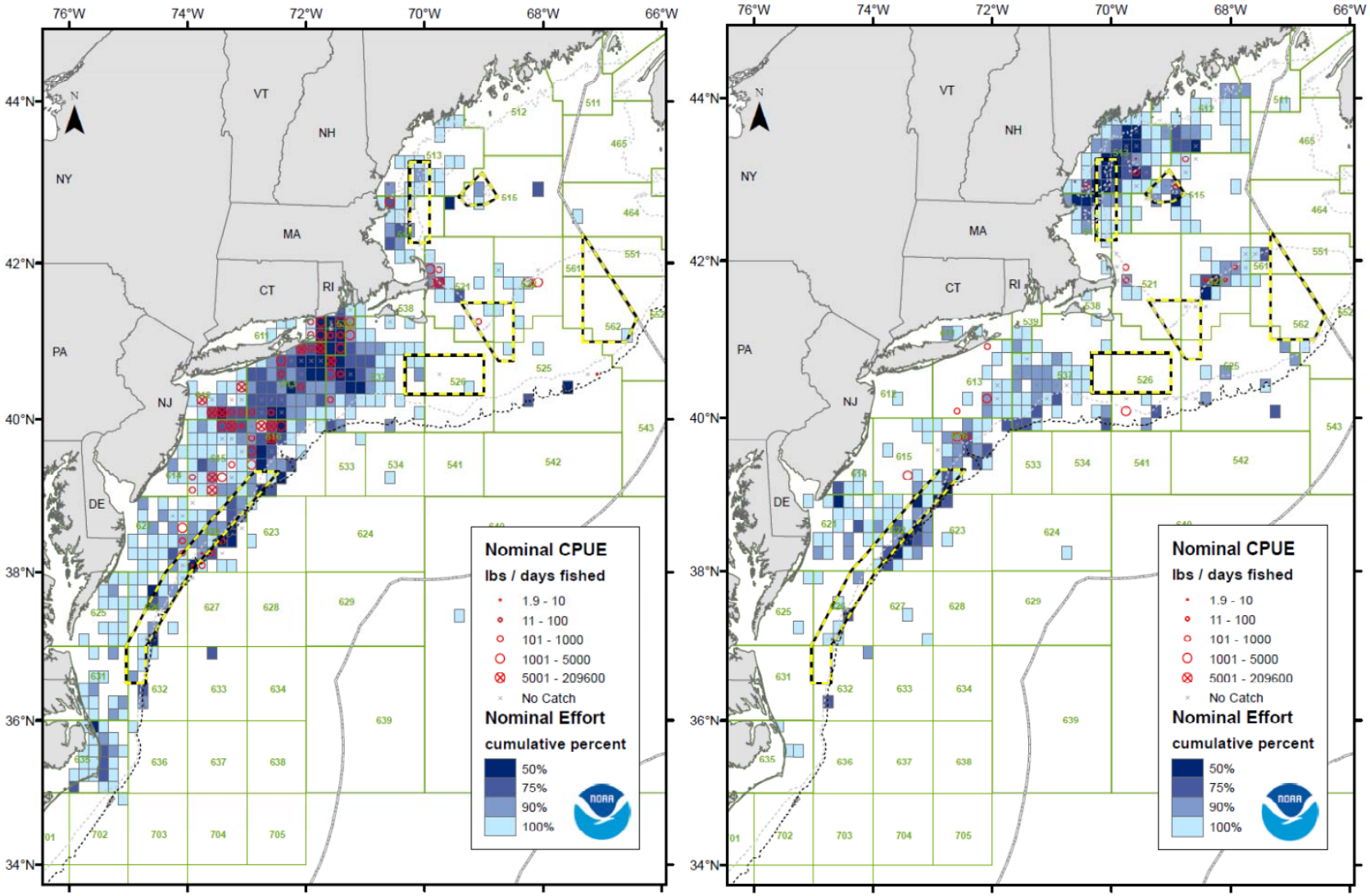


Figure 31. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the paired and single midwater trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 1 (left) and 2 (right) for 2005-2010.

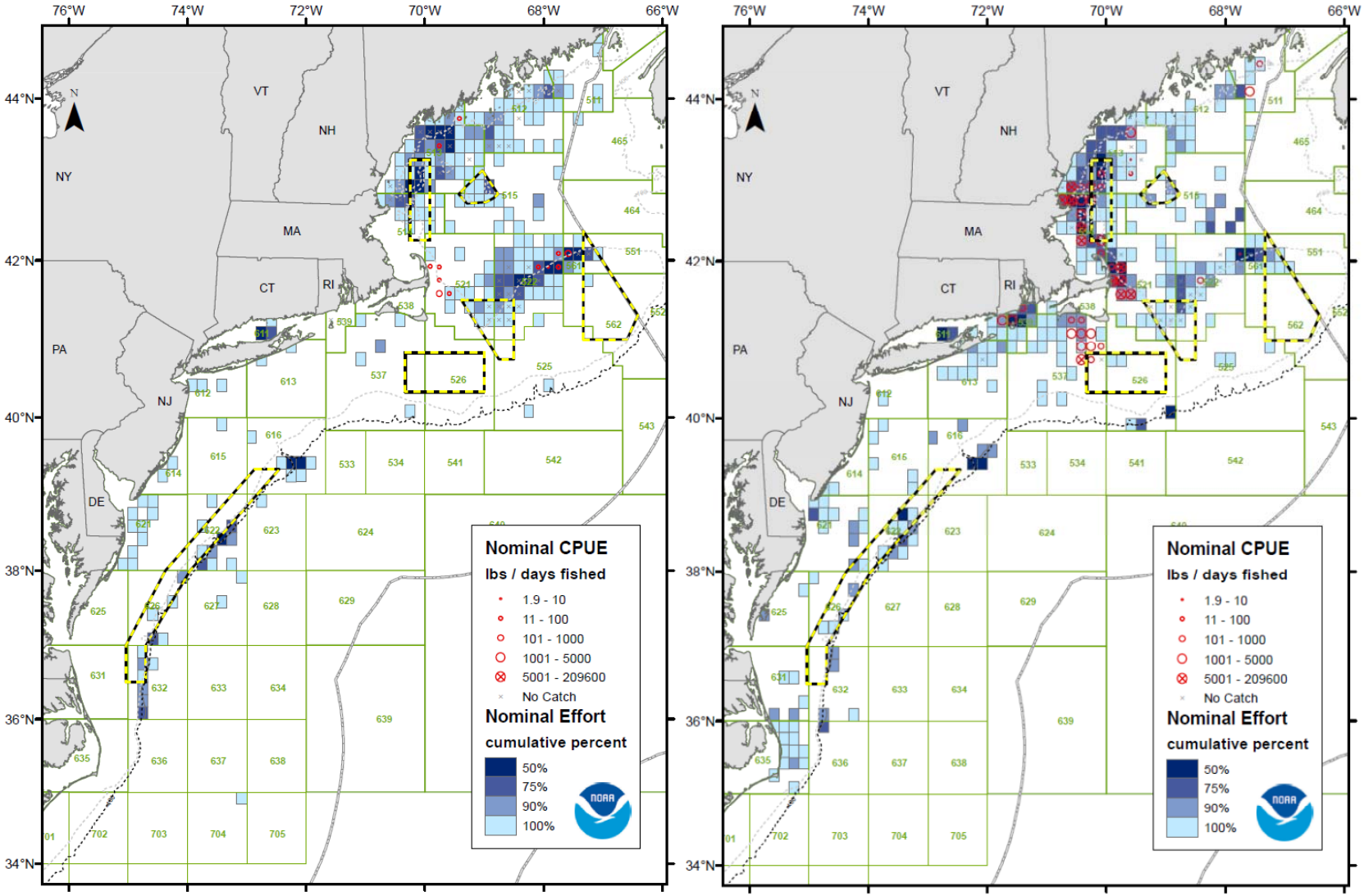


Figure 32. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the paired and single midwater trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 3 (left) and 4 (right) for 2005-2010.

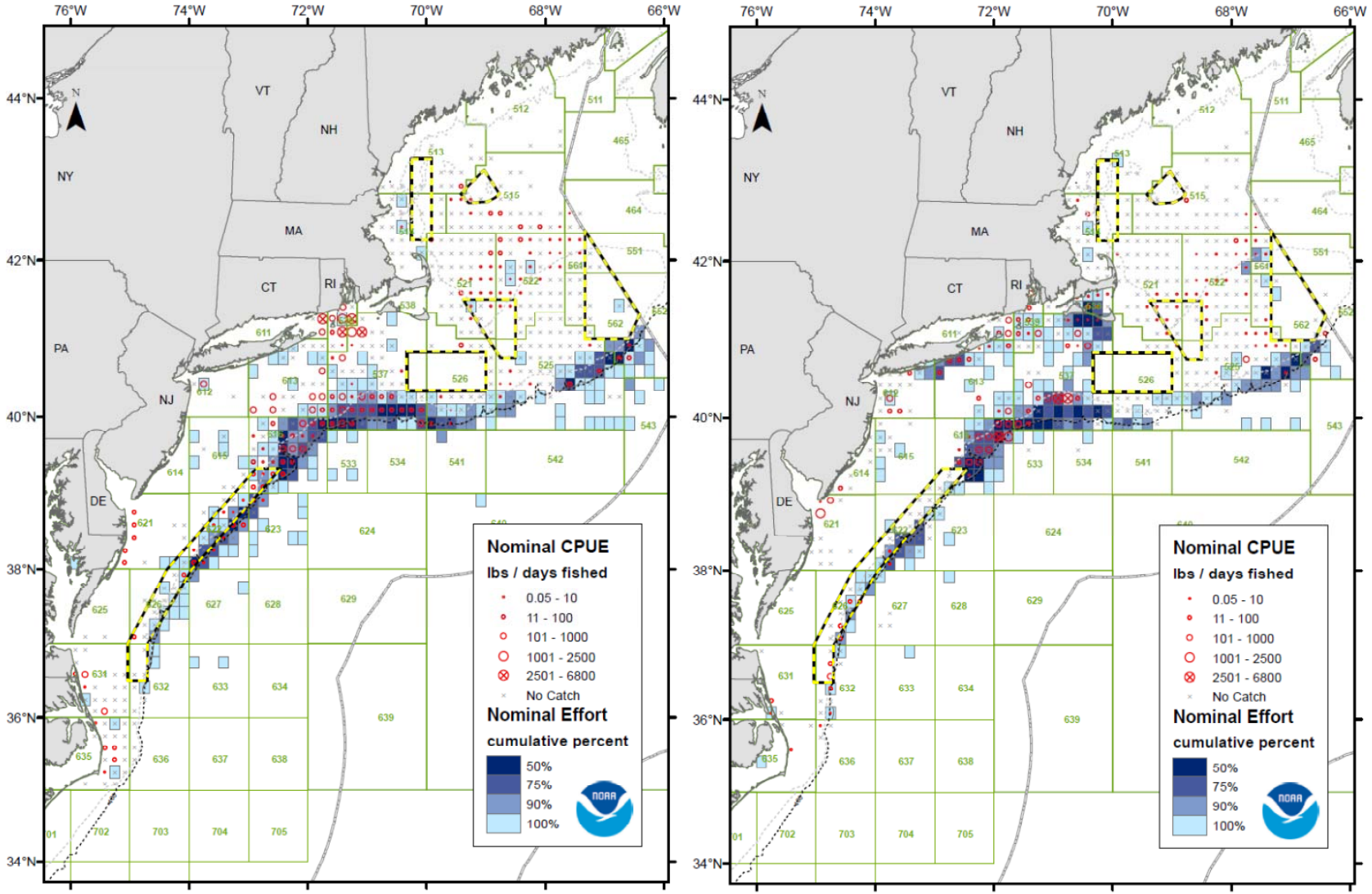


Figure 33. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 1 (left) and 2 (right) for 2005-2010.

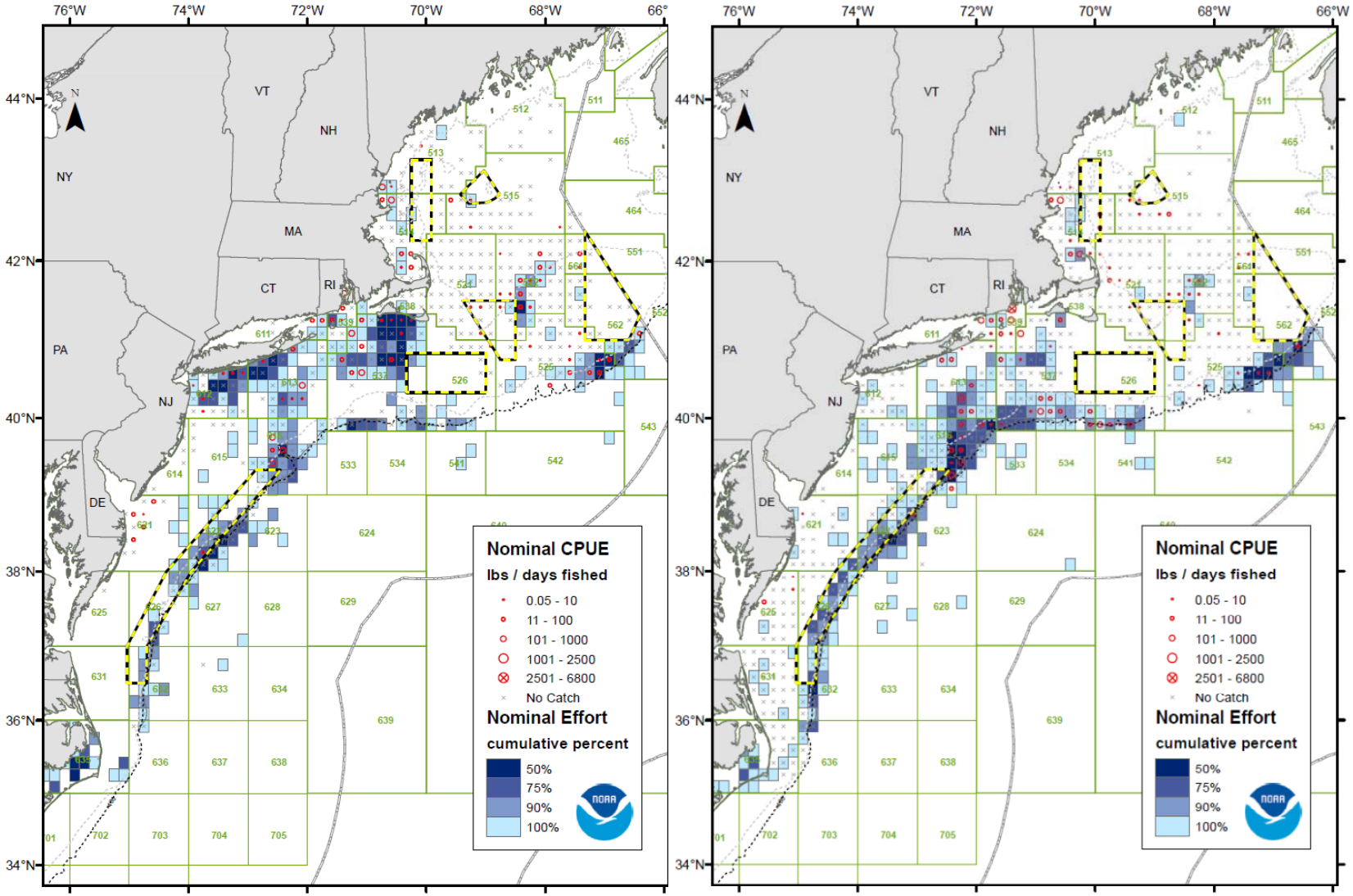


Figure 34. Spatial distribution of nominal effort (days fished from Vessel Trip Reports) for the small mesh (codend mesh ≤ 3.5 in.) bottom trawl fleet and the fleet's incidental catch rates (kept+discarded weight/days fished from observed NEFOP trips) of alewife, blueback herring, hickory shad, and American shad combined, by ten-minute square, during Quarter 3 (left) and 4 (right) for 2005-2010.

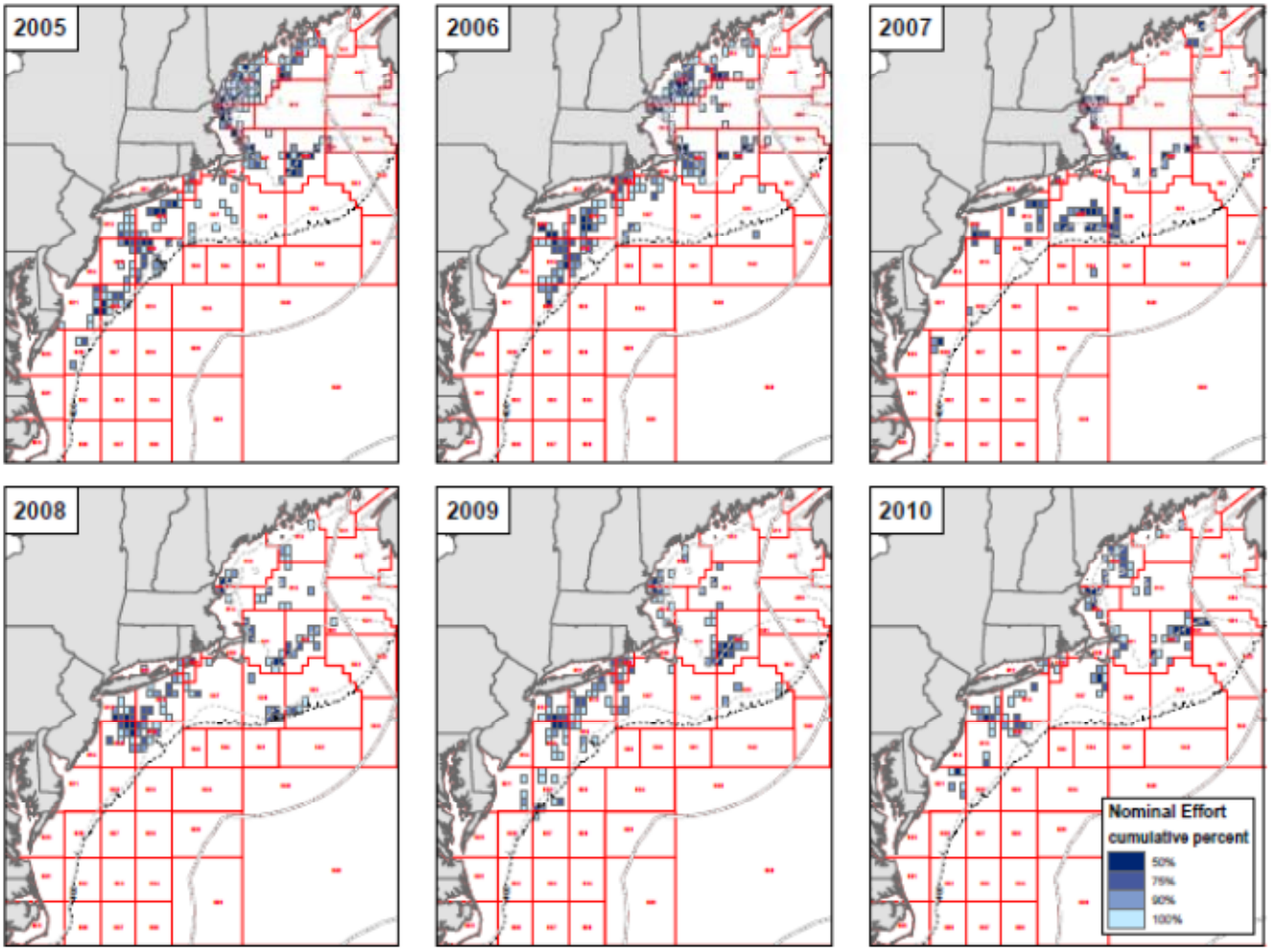


Figure 35. Variability in the spatial distribution of fishing effort (days fished from the Vessel Trip Reports), by the paired midwater trawl fleet, during 2005-2010.

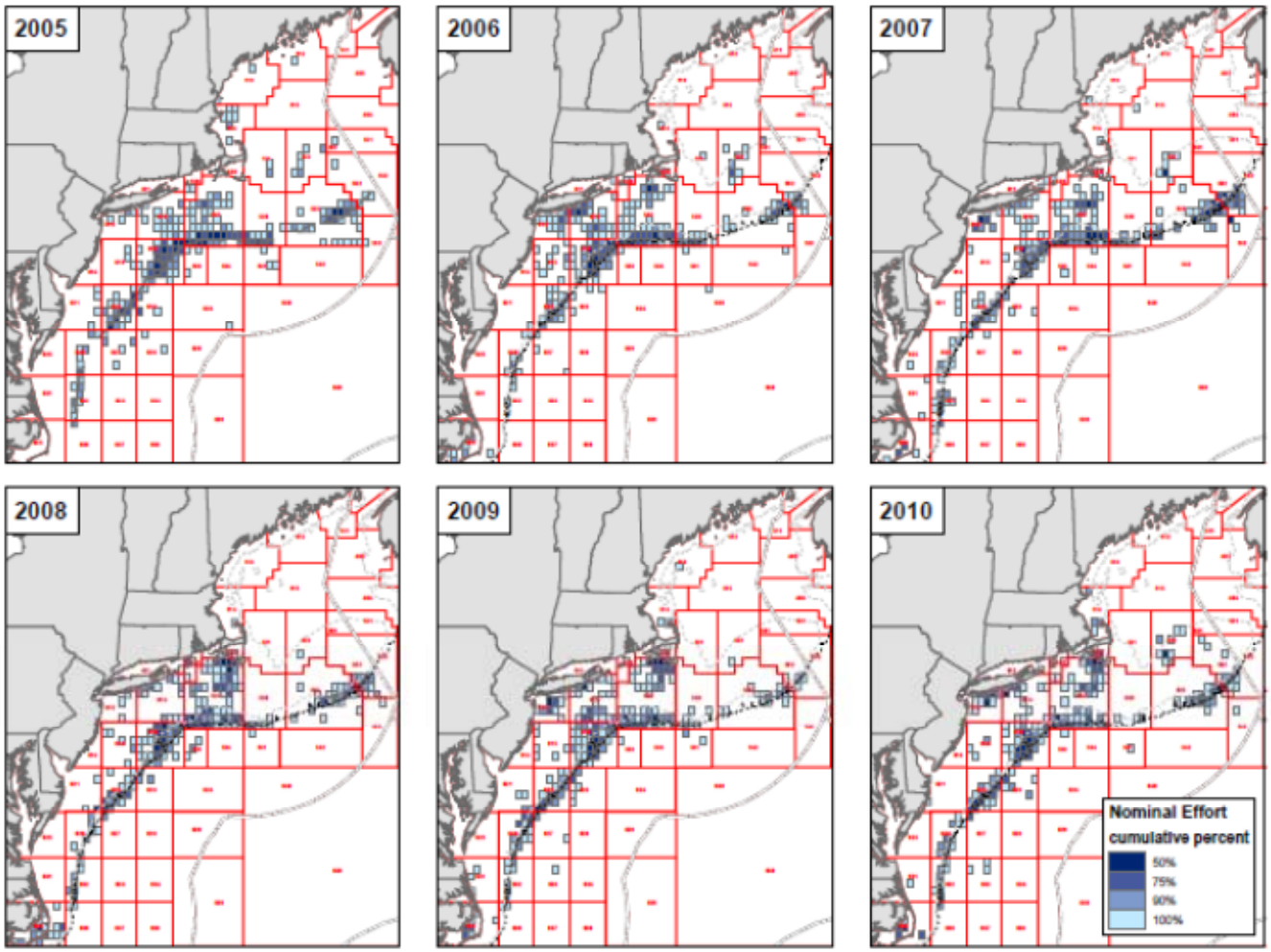


Figure 36. Variability in the spatial distribution of fishing effort (days fished from the Vessel Trip Reports), by the small mesh (codend mesh ≤ 3.5 in.) trawl fleet, during 2005-2010.

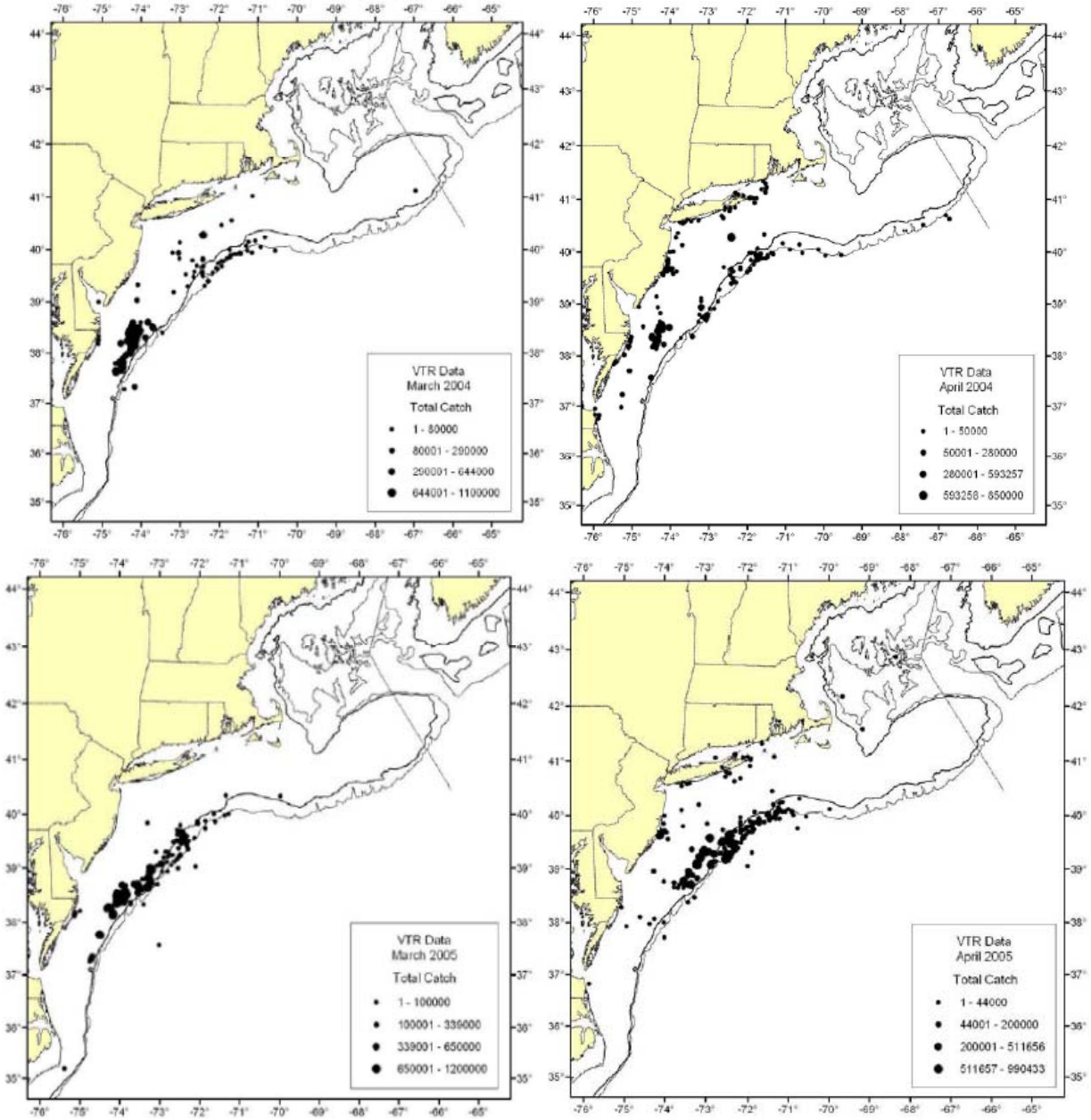


Figure 37. Differences in the spatial distributions of Atlantic mackerel catches during March and April of 2004 (top) versus 2005 (bottom). Each circle may represent a portion of a trip if the trip occurred in different statistical areas. Source: 2009 Working Paper for TRAC assessment of mackerel.

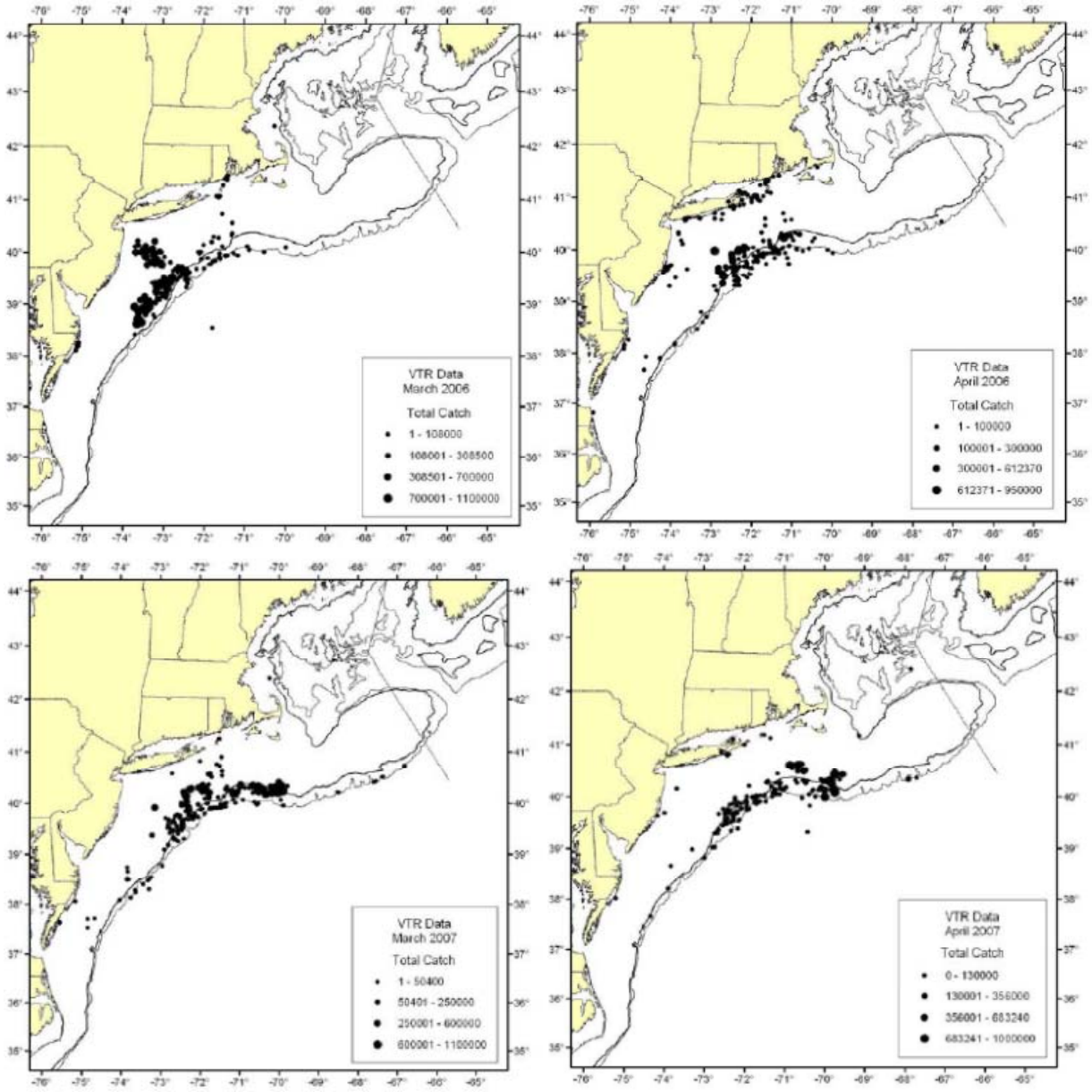


Figure 38. Differences in the spatial distributions of Atlantic mackerel catches during March and April of 2006 (top) versus 2007 (bottom). Each circle may represent a portion of a trip if the trip occurred in different statistical areas. Source: 2009 Working Paper for TRAC assessment of mackerel.

sub Appendix 1 (still part of Appenidx 2)

Table A1: Species-specific total annual incidental catch (mt) and the associated coefficient of variation across all fleets and regions. Midwater trawl estimates were only included beginning in 2005.

	Alewife		American shad		Blueback herring		Herring NK		Hickory Shad	
Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
1989	20.35	0.49	58.92	0.60	19.60	0.39	7.08	1.03	0.00	
1990	55.31	0.68	25.81	0.34	78.94	0.44	331.34	0.72	0.00	
1991	68.24	0.48	104.27	0.25	115.41	0.37	110.46	0.48	39.35	0.00
1992	30.56	0.36	79.80	0.29	458.17	0.44	387.54	0.39	0.00	
1993	40.47	0.51	50.96	0.52	210.56	0.40	18.60	0.46	0.00	
1994	5.45	0.30	70.31	0.67	40.16	0.33	9.79	0.59	0.24	0.31
1995	6.36	0.48	17.17	0.41	213.50	0.43	51.89	1.44	0.02	1.42
1996	482.01	1.07	39.99	0.38	1803.43	2.10	28.68	0.43	26.64	0.82
1997	41.25	1.01	37.00	0.67	982.04	0.65	67.60	4.25	18.27	0.90
1998	80.88	1.47	55.31	0.43	49.32	1.27	0.42	0.65	39.19	1.45
1999	3.86	0.96	15.72	0.41	206.66	0.59	128.81	1.26	56.79	0.58
2000	28.37	0.67	74.39	1.82	55.46	0.37	21.96	0.53	0.06	0.80
2001	93.02	1.05	61.92	0.42	120.13	0.47	2.10	0.42	80.62	0.38
2002	2.72	3.86	24.07	0.41	173.23	0.31	76.51	1.85	1.41	1.05
2003	248.43	1.46	21.37	0.91	332.48	0.56	15.31	1.21	14.30	0.89
2004	99.74	0.93	18.16	0.35	81.54	0.47	176.74	0.74	35.03	0.78
2005	347.43	0.42	78.24	0.32	220.04	0.38	7.18	0.60	19.41	0.38
2006	57.61	0.91	29.29	4.37	187.48	0.67	232.02	1.16	13.35	0.81
2007	484.02	0.79	55.08	0.45	180.13	1.47	105.31	2.08	4.77	0.98
2008	145.03	0.43	52.38	0.32	526.59	0.57	327.99	0.40	7.83	0.65
2009	158.66	0.26	59.54	0.45	202.02	0.30	180.05	0.91	10.89	0.83
2010	118.50	0.20	46.12	0.17	125.02	0.20	86.50	0.32	1.12	0.65

Table A2: Mid-Atlantic total annual incidental catch (mt) and the associated coefficient of variation for bottom trawl, single and paired midwater trawls, gillnet, and all other fleets for each individual species. Herring NK represents unknown herring. Midwater trawl estimates are only included beginning in 2005.

		Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
Alewife	1989	15.55	0.61					0.00		0.00	
	1990	0.04	1.07					0.00		0.00	
	1991	54.78	0.59					0.00		0.00	
	1992	21.74	0.51					0.00		0.00	
	1993	0.00						0.00		0.00	
	1994	0.00						0.00		0.00	
	1995	0.00	3.28					0.00		0.00	
	1996	386.70	1.33					0.03	0.13	0.00	
	1997	7.63	3.31					0.00		0.00	
	1998	0.00						0.01	0.30	0.00	
	1999	0.13	2.03					0.00		0.76	0.26
	2000	1.38	1.28					0.00		6.70	0.88
	2001	3.24	0.59					0.83	1.49	0.00	
	2002	1.52	6.90					0.00		0.00	
	2003	201.52	1.80					0.00		0.00	
	2004	24.83	1.57					0.00		51.49	1.61
	2005	72.68	0.70	21.35	1.43	162.03	0.78	0.14	1.08	0.00	
	2006	19.97	2.47	13.96	1.07	2.61	1.11	0.00		0.00	
	2007	8.87	3.12	0.00		0.00		0.00		0.00	
	2008	5.20	1.71	1.81	0.57	4.51	0.69	0.00		0.00	
	2009	4.24	1.10	24.06	0.98	27.90	0.63	0.00		0.00	
	2010	6.85	0.51	3.16	0.92	5.40	0.52	0.00		0.01	0.97
American Shad	1989	13.32	0.41					0.00		0.00	
	1990	4.15	0.46					0.00		0.00	
	1991	28.95	0.50					0.00		0.00	
	1992	20.25	0.42					0.00		0.00	
	1993	0.71	1.29					0.00		0.00	
	1994	45.73	1.00					0.43	0.11	0.00	
	1995	0.46	3.63					1.14	0.55	0.00	
	1996	2.44	0.51					8.66	0.57	0.00	
	1997	11.21	1.92					2.78	0.20	0.00	
	1998	9.49	1.05					20.64	0.34	0.00	
	1999	1.77	1.89					5.40	0.49	1.48	1.33
	2000	0.11	0.52					4.27	0.87	64.25	2.11
	2001	0.78	0.77					59.09	0.44	0.00	

Species	Year	Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
		Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	2002	0.40	0.73					1.93	0.41	0.00	
	2003	9.41	2.03					1.25	0.59	0.01	1.06
	2004	3.85	0.62					0.13	0.39	0.04	0.86
	2005	8.83	0.40	0.48	1.43	27.30	0.53	0.00		0.00	
	2006	0.63	2.03	3.92	1.07	0.00		11.89	10.70	0.00	
	2007	7.75	1.93	0.00		0.00		0.83	2.49	0.00	
	2008	0.85	0.79	1.40	0.27	13.84	0.94	0.00		0.00	
	2009	2.78	0.60	0.12	1.07	0.05	1.02	2.97	6.78	0.00	
	2010	13.97	0.43	0.00		0.93	0.76	0.00		0.00	
Blueback Herring	1989	8.93	0.65					0.00		0.00	
	1990	56.86	0.48					0.00		0.00	
	1991	49.54	0.53					0.00		0.00	
	1992	360.88	0.44					0.00		0.00	
	1993	112.69	0.53					0.00		0.12	1.15
	1994	0.00						0.00		0.00	
	1995	2.24	3.33					0.17	1.55	0.00	
	1996	1777.32	2.13					0.03	0.87	0.00	
	1997	878.61	0.67					0.09	0.48	0.00	
	1998	49.05	1.28					0.11	0.23	0.00	
	1999	0.10	0.52					0.01	1.34	0.00	
	2000	54.02	0.38					0.00		0.00	
	2001	78.34	0.49					0.19	0.78	0.02	2.11
	2002	11.52	0.76					0.00		0.00	
	2003	37.41	1.91					0.15	0.47	0.00	
	2004	22.23	1.11					0.03	1.04	0.00	
	2005	16.76	0.45	1.31	0.91	123.94	0.61	0.00		0.00	
	2006	2.99	3.65	151.37	0.81	19.07	1.13	0.01	0.88	0.00	
	2007	1.21	1.33	0.00		0.00		0.00		0.02	0.94
	2008	0.30	1.09	1.58	0.35	380.77	0.75	0.00		0.00	
	2009	5.57	0.32	27.99	0.96	51.90	0.74	0.00		0.01	0.88
	2010	7.81	0.86	1.66	0.65	7.51	0.88	0.00		0.01	1.03
Herring NK	1989	0.00						0.00		0.00	
	1990	111.73	0.69					0.00		0.00	
	1991	76.60	0.56					0.00		0.00	
	1992	53.54	0.65					0.00		0.00	
	1993	3.65	0.00					0.00		0.00	
	1994	0.08	1.00					0.38	0.10	0.00	
	1995	0.36	2.82					0.03	0.49	0.07	1.13
	1996	7.01	0.79					0.32	0.84	0.00	

Species	Year	Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
		Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	1997	0.00						0.00		0.00	
	1998	0.07	1.85					0.16	0.25	0.00	
	1999	45.35	2.06					0.14	1.09	0.00	
	2000	0.64	0.98					0.23	0.63	6.34	0.94
	2001	0.93	0.80					0.12	0.62	0.00	
	2002	2.21	0.73					0.00		0.00	
	2003	0.00						0.02	1.68	0.01	1.29
	2004	167.25	0.78					0.00		0.00	
	2005	1.89	0.73	0.00		0.00		0.06	1.50	0.07	0.19
	2006	0.00		0.00		0.00		0.09	0.96	0.00	
	2007	10.41	4.76	0.00		0.10	0.73	22.37	0.86	0.00	
	2008	52.40	1.12	75.02	0.53	0.00		0.00		0.00	
	2009	3.84	0.71	0.00		158.78	1.02	0.00		0.79	0.82
	2010	43.02	0.58	0.00		0.03	0.97	0.00		2.96	0.95
	1989	0.00						0.00		0.00	
	1990	0.00						0.00		0.00	
	1991	0.00						0.00		39.35	0.00
	1992	0.00						0.00		0.00	
	1993	0.00						0.00		0.00	
	1994	0.00						0.11	0.17	0.00	
	1995	0.02	2.09					0.01	0.11	0.00	
	1996	8.92	0.57					0.47	0.32	0.00	
	1997	4.82	2.18					5.41	0.80	0.00	
	1998	0.00						0.47	0.39	0.31	0.98
Hickory Shad	1999	0.11	2.47					0.14	0.71	52.14	0.63
	2000	0.00						0.05	0.87	0.00	
	2001	3.10	1.04					10.99	0.53	0.00	
	2002	0.00						1.28	1.15	0.00	
	2003	4.58	2.61					1.52	1.73	5.35	0.40
	2004	5.44	1.60					19.91	1.25	1.60	2.28
	2005	7.32	0.41	0.08	0.69	0.06	0.89	0.12	1.27	0.00	
	2006	3.83	0.75	0.00		0.00		0.00		0.00	
	2007	1.59	2.86	0.00		0.00		0.44	0.77	0.00	
	2008	0.26	0.88	0.00		0.00		0.00		3.63	1.20
	2009	0.18	1.14	0.00		0.00		1.35	2.36	7.14	1.17
	2010	0.02	0.51	0.00		0.00		0.32	0.70	0.64	1.08

Table A3: New England total annual incidental catch (mt) and the associated coefficient of variation for bottom trawl, single and paired midwater trawls, gillnet, and all other fleets for each individual species. Herring NK represents unknown herring. Midwater trawl estimates are only included beginning in 2005.

		Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
Alewife	1989	4.66	0.63					0.00		0.13	0.95
	1990	55.27	0.68					0.00		0.00	
	1991	4.02	0.62					0.00		9.44	0.44
	1992	1.92	0.45					0.00		6.90	0.25
	1993	33.80	0.61					0.00		6.67	0.28
	1994	0.08	1.56					0.00		5.36	0.31
	1995	2.10	1.37					0.09	1.07	4.17	0.25
	1996	38.37	0.39					1.31	1.02	55.60	0.47
	1997	10.08	3.16					0.00		23.54	0.40
	1998	80.88	1.47					0.00		0.00	
	1999	2.96	1.24					0.00		0.00	
	2000	20.30	0.88					0.00		0.00	
	2001	88.94	1.10					0.00		0.00	
	2002	1.20	0.78					0.00		0.00	
	2003	38.87	0.57					0.03	0.66	8.02	0.46
	2004	21.31	0.59					0.04	0.55	2.08	0.74
	2005	12.98	0.75	1.92	0.90	71.99	0.48	0.02	0.56	4.32	0.52
	2006	15.86	0.52	1.34	1.56	1.81	0.72	0.00		2.05	0.43
	2007	259.38	0.41	116.52	2.89	97.42	1.42	0.02	1.41	1.82	0.80
	2008	31.84	0.85	40.49	1.04	60.46	0.60	0.00		0.71	0.38
	2009	31.26	0.51	10.60	0.53	57.29	0.42	0.01	0.63	3.30	0.41
	2010	28.62	0.40	0.58	0.36	69.08	0.28	0.02	0.49	4.79	0.34
American Shad	1989	45.43	0.77					0.00		0.18	1.02
	1990	18.86	0.44					0.00		2.79	0.56
	1991	70.77	0.30					0.00		4.54	1.11
	1992	56.54	0.38					0.00		3.01	0.41
	1993	49.68	0.53					0.00		0.57	0.97
	1994	22.86	0.55					1.12	0.88	0.16	0.76
	1995	6.52	0.96					8.89	0.29	0.16	1.05
	1996	1.05	4.45					27.82	0.48	0.03	1.10
	1997	13.68	0.87					5.01	0.44	4.31	0.60
	1998	16.98	1.20					8.19	0.44	0.00	
	1999	0.93	0.64					6.15	0.71	0.00	
	2000	1.50	1.20					4.25	0.51	0.00	
	2001	1.98	0.62					0.07	1.66	0.00	

Species	Year	Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
		Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	2002	4.56	1.41					17.17	0.44	0.00	
	2003	8.52	0.41					2.18	0.78	0.02	1.07
	2004	11.52	0.52					2.63	0.26	0.00	1.29
	2005	7.59	0.48	1.98	1.04	29.97	0.67	2.09	0.25	0.00	
	2006	3.04	0.60	0.00		0.18	0.63	9.46	1.18	0.15	1.06
	2007	1.45	0.28	0.00		17.15	0.78	27.86	0.52	0.03	0.95
	2008	2.95	0.38	2.57	1.09	2.43	0.84	28.30	0.37	0.04	0.99
	2009	17.98	0.51	20.64	0.69	6.76	0.34	7.83	0.28	0.42	0.83
	2010	11.22	0.25	0.11	0.49	10.28	0.37	9.61	0.19	0.00	
Blueback Herring	1989	8.20	0.56					0.00		2.48	0.69
	1990	19.64	1.11					0.00		2.44	0.60
	1991	57.25	0.58					0.00		8.62	0.83
	1992	85.85	1.45					0.00		11.44	0.50
	1993	96.72	0.61					0.00		1.02	0.55
	1994	32.99	0.37					6.64	0.84	0.53	0.71
	1995	59.07	0.83					104.57	0.71	47.44	0.48
	1996	1.53	1.35					0.23	0.73	24.33	0.36
	1997	51.56	4.66					0.00		51.79	0.51
	1998	0.00						0.17	0.72	0.00	
	1999	206.56	0.59					0.00		0.00	
	2000	1.43	0.87					0.00		0.01	0.67
	2001	41.50	1.00					0.00		0.08	0.96
	2002	161.07	0.33					0.64	1.23	0.00	
	2003	279.00	0.61					0.02	0.79	15.90	0.41
	2004	54.11	0.55					1.83	0.69	3.34	0.61
	2005	15.75	0.70	14.03	1.22	45.50	0.55	0.23	0.80	2.53	0.75
	2006	3.14	0.82	7.06	0.73	3.65	0.77	0.00		0.17	0.76
	2007	38.65	0.60	72.91	3.51	64.97	1.05	0.01	1.32	2.37	0.83
	2008	13.73	0.83	17.46	0.76	109.73	0.84	0.02	1.31	3.01	0.77
	2009	42.84	0.56	9.85	0.56	61.42	0.46	0.03	0.84	2.40	0.47
	2010	9.79	0.41	0.39	1.09	74.45	0.27	0.07	0.39	23.34	0.45
Herring NK	1989	7.08	1.03					0.00		0.00	
	1990	218.18	1.04					0.00		1.43	0.82
	1991	28.44	1.04					0.00		5.43	1.35
	1992	318.11	0.46					0.00		15.88	0.37
	1993	14.75	0.58					0.00		0.20	0.51
	1994	2.26	0.53					6.73	0.84	0.35	0.56
	1995	44.96	1.66					3.69	0.59	2.79	0.91
	1996	20.80	0.53					0.30	0.99	0.25	1.08

Species	Year	Bottom Trawl		Single MWT		Paired MWT		Gillnet		Other	
		Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	1997	67.48	4.26					0.08	1.28	0.04	0.64
	1998	0.18	1.27					0.00		0.00	
	1999	83.28	1.59					0.03	1.15	0.00	
	2000	14.75	0.68					0.00		0.01	1.03
	2001	0.00						0.05	1.54	1.00	0.46
	2002	74.30	1.91					0.00		0.00	
	2003	15.25	1.21					0.03	0.59	0.00	
	2004	9.47	0.63					0.02	0.57	0.00	
	2005	3.20	1.24	0.15	1.36	0.00		0.17	0.52	1.64	0.55
	2006	57.53	1.49	168.41	1.52	0.00		2.25	0.50	3.75	0.58
	2007	72.42	2.93	0.00		0.00		0.00		0.00	
	2008	97.17	0.58	0.98	1.13	0.00		0.00		102.41	0.93
	2009	15.01	1.48	0.00		0.67	0.91	0.63	0.62	0.35	0.78
	2010	8.52	0.90	0.49	0.46	17.84	0.18	0.29	0.46	13.34	0.55
Hickory Shad	1989	0.00						0.00		0.00	
	1990	0.00						0.00		0.00	
	1991	0.00						0.00		0.00	
	1992	0.00						0.00		0.00	
	1993	0.00						0.00		0.00	
	1994	0.10	0.63					0.00		0.03	1.05
	1995	0.00						0.00		0.00	
	1996	17.26	1.24					0.00		0.00	
	1997	3.68	3.16					0.00		4.37	0.63
	1998	38.40	1.48					0.00		0.00	
	1999	4.40	0.70					0.00		0.00	
	2000	0.00	0.83					0.00		0.00	
	2001	66.53	0.45					0.00		0.00	
	2002	0.12	1.00					0.00		0.00	
	2003	2.59	1.02					0.27	0.46	0.00	
	2004	8.04	0.78					0.04	0.84	0.00	
	2005	2.68	0.45	2.58	1.37	6.56	0.86	0.01	0.85	0.00	
	2006	9.32	1.12	0.15	1.56	0.00		0.04	1.00	0.01	1.06
	2007	1.99	0.38	0.37	1.66	0.00		0.28	1.33	0.11	0.98
	2008	0.90	0.52	0.00		2.89	0.88	0.02	0.91	0.12	1.01
	2009	2.05	0.76	0.00		0.00		0.17	0.61	0.00	
	2010	0.06	0.67	0.00	0.19	0.00		0.08	0.68	0.00	

Table A4: Mid-Atlantic total annual incidental catch (mt) and the associated coefficient of variation by mesh category for bottom trawl and gillnet for each individual species. Herring NK represents unknown herring. Midwater trawl estimates are only included beginning in 2005.

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
Alewife	1989	15.55	0.61	0.00		0.00		0.00		0.00			
	1990	0.04	1.07	0.00		0.00		0.00		0.00		0.00	
	1991	54.78	0.59	0.00		0.00		0.00		0.00			
	1992	21.72	0.51	0.00		0.02	1.10	0.00		0.00			
	1993	0.00		0.00		0.00		0.00		0.00			
	1994	0.00		0.00		0.00		0.00		0.00		0.00	
	1995	0.00	3.28	0.00		0.00		0.00		0.00		0.00	
	1996	386.66	1.33	0.04	0.53	0.00		0.03	0.12	0.00	0.81	0.00	
	1997	6.74	3.75	0.89	0.44	0.00		0.00		0.00		0.00	
	1998	0.00		0.00		0.00		0.01	0.30	0.00		0.00	
	1999	0.13	2.03	0.00		0.00		0.00		0.00		0.00	
	2000	1.38	1.28	0.00		0.00		0.00		0.00		0.00	
	2001	3.24	0.59	0.00		0.00		0.83	1.49	0.00		0.00	
	2002	1.52	6.90	0.00		0.00		0.00		0.00		0.00	
	2003	201.52	1.80	0.00		0.00		0.00		0.00		0.00	
	2004	24.29	1.61	0.54	0.50	0.00		0.00		0.00		0.00	
	2005	71.58	0.71	1.11	3.34	0.00		0.14	1.08	0.00		0.00	
	2006	19.20	2.57	0.10	2.74	0.67	1.95	0.00		0.00		0.00	
	2007	8.86	3.12	0.01	0.58	0.00		0.00		0.00		0.00	
	2008	4.95	1.80	0.02	1.38	0.24	0.74	0.00		0.00		0.00	
	2009	3.62	1.28	0.09	1.04	0.53	0.82	0.00		0.00		0.00	
	2010	6.63	0.53	0.06	0.45	0.16	0.95	0.00		0.00		0.00	
American Shad	1989	11.34	0.48	0.00		1.98	0.00	0.00		0.00			
	1990	4.15	0.46	0.00		0.00		0.00		0.00		0.00	
	1991	16.27	0.49	12.67	0.94	0.00		0.00		0.00			
	1992	20.13	0.42	0.00		0.12	0.51	0.00		0.00			
	1993	0.71	1.29	0.00		0.00		0.00		0.00			
	1994	45.69	1.00	0.00		0.04	0.75	0.42	0.11	0.01	0.27	0.00	
	1995	0.43	3.92	0.03	0.90	0.00		0.36	1.56	0.78	0.35	0.00	
	1996	2.42	0.51	0.02	7.54	0.00		7.27	0.68	1.39	0.28	0.00	
	1997	6.17	3.48	5.04	0.40	0.00		0.53	0.54	2.23	0.22	0.02	0.86
	1998	9.49	1.05	0.00		0.00		13.36	0.51	6.49	0.23	0.79	0.87
	1999	1.57	2.12	0.19	0.91	0.00		1.75	0.77	3.64	0.62	0.00	
	2000	0.11	0.52	0.00		0.00		0.00	1.08	4.27	0.87	0.00	
	2001	0.61	0.68	0.18	2.48	0.00		58.84	0.44	0.25	0.65	0.00	

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	2002	0.40	0.73	0.00		0.00		1.65	0.48	0.29	0.19	0.00	
	2003	9.41	2.03	0.00		0.00		0.12	0.70	1.12	0.65	0.00	
	2004	3.23	0.73	0.25	0.83	0.38	0.70	0.13	0.39	0.00		0.00	
	2005	7.88	0.44	0.01	3.34	0.94	0.59	0.00		0.00		0.00	
	2006	0.63	2.03	0.00		0.00		0.11	0.34	11.79	10.80	0.00	
	2007	4.68	3.16	3.07	0.76	0.00		0.44	1.06	0.39	5.17	0.00	
	2008	0.51	1.27	0.35	0.60	0.00		0.00		0.00		0.00	
	2009	2.39	0.69	0.26	0.69	0.13	0.85	0.69	2.17	2.28	8.80	0.00	
	2010	13.51	0.45	0.38	0.51	0.08	1.11	0.00		0.00		0.00	
	1989	8.93	0.65	0.00		0.00		0.00		0.00			
	1990	49.94	0.52	6.93	1.22	0.00		0.00		0.00		0.00	
	1991	49.53	0.53	0.01	1.06	0.00		0.00		0.00			
	1992	360.88	0.44	0.00		0.00		0.00		0.00			
	1993	112.69	0.53	0.00		0.00		0.00		0.00			
	1994	0.00		0.00		0.00		0.00		0.00		0.00	
	1995	2.18	3.43	0.00		0.06	1.21	0.10	2.56	0.07	0.40	0.00	
	1996	1777.32	2.13	0.00		0.00		0.03	0.93	0.00	0.86	0.00	
	1997	877.27	0.68	1.34	1.30	0.00		0.00		0.02	0.52	0.07	0.60
	1998	49.05	1.28	0.00		0.00		0.04	0.30	0.07	0.33	0.00	0.91
Blueback Herring	1999	0.10	0.52	0.00		0.00		0.01	1.34	0.00		0.00	
	2000	54.02	0.38	0.00		0.00		0.00		0.00		0.00	
	2001	78.34	0.49	0.00		0.00		0.00		0.00		0.19	0.78
	2002	11.52	0.76	0.00		0.00		0.00		0.00		0.00	
	2003	37.41	1.91	0.00		0.00		0.15	0.47	0.00		0.00	
	2004	18.21	1.35	3.90	0.56	0.13	1.06	0.00		0.00		0.03	1.04
	2005	16.61	0.45	0.13	0.52	0.02	0.91	0.00		0.00		0.00	
	2006	2.79	3.91	0.20	0.60	0.00		0.01	0.88	0.00		0.00	
	2007	0.72	2.20	0.49	0.58	0.00		0.00		0.00		0.00	
	2008	0.30	1.09	0.00		0.00		0.00		0.00		0.00	
	2009	5.40	0.32	0.00		0.17	0.75	0.00		0.00		0.00	
	2010	7.74	0.87	0.01	0.47	0.06	1.09	0.00		0.00		0.00	
	1989	0.00		0.00		0.00		0.00		0.00			
	1990	111.73	0.69	0.00		0.00		0.00		0.00		0.00	
	1991	76.60	0.56	0.00		0.00		0.00		0.00			
Herring NK	1992	51.48	0.67	2.07	1.56	0.00		0.00		0.00			
	1993	0.00		3.65	0.00	0.00		0.00		0.00			
	1994	0.08	1.00	0.00		0.00		0.38	0.10	0.00	0.63	0.00	
	1995	0.31	3.25	0.00		0.05	1.09	0.00	0.18	0.03	0.51	0.00	
	1996	7.01	0.79	0.00		0.00		0.29	0.93	0.03	0.81	0.00	

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	1997	0.00		0.00		0.00		0.00		0.00		0.00	
	1998	0.07	1.85	0.00		0.00		0.01	0.30	0.13	0.28	0.02	0.91
	1999	45.35	2.06	0.00		0.00		0.07	0.81	0.07	1.96	0.00	
	2000	0.60	1.03	0.00		0.04	2.67	0.21	0.67	0.02	1.03	0.00	
	2001	0.93	0.80	0.00		0.00		0.12	0.62	0.00		0.00	
	2002	2.21	0.73	0.00		0.00		0.00		0.00		0.00	
	2003	0.00		0.00		0.00		0.02	1.68	0.00		0.00	
	2004	167.25	0.78	0.00		0.00		0.00		0.00		0.00	
	2005	1.89	0.73	0.00	0.83	0.00		0.06	1.50	0.00		0.00	
	2006	0.00		0.00		0.00		0.09	0.96	0.00		0.00	
	2007	10.41	4.76	0.00	2.55	0.00		0.00		22.37	0.86	0.00	
	2008	52.35	1.12	0.05	0.61	0.00		0.00		0.00		0.00	
	2009	3.79	0.72	0.05	0.87	0.00		0.00		0.00		0.00	
	2010	43.01	0.58	0.01	1.12	0.00		0.00		0.00		0.00	
	1989	0.00		0.00		0.00		0.00		0.00			
	1990	0.00		0.00		0.00		0.00		0.00		0.00	
	1991	0.00		0.00		0.00		0.00		0.00			
	1992	0.00		0.00		0.00		0.00		0.00			
	1993	0.00		0.00		0.00		0.00		0.00			
	1994	0.00		0.00		0.00		0.11	0.17	0.00	0.63	0.00	
	1995	0.00		0.00		0.02	2.09	0.01	0.11	0.00		0.00	
	1996	8.92	0.57	0.00		0.00		0.16	0.16	0.30	0.49	0.00	
	1997	3.01	3.40	1.81	1.24	0.00		5.40	0.80	0.00	0.91	0.00	
	1998	0.00		0.00		0.00		0.47	0.39	0.00		0.00	
Hickory Shad	1999	0.11	2.47	0.00		0.00		0.14	0.71	0.00		0.00	
	2000	0.00		0.00		0.00		0.02	1.07	0.03	1.28	0.00	
	2001	0.44	0.53	2.66	1.21	0.00		10.94	0.54	0.05	0.87	0.00	
	2002	0.00		0.00		0.00		1.28	1.15	0.00		0.00	
	2003	4.44	2.70	0.14	0.71	0.00		1.52	1.73	0.00		0.00	
	2004	5.44	1.60	0.00		0.00		0.00		19.91	1.25	0.00	
	2005	7.11	0.42	0.07	2.60	0.15	0.62	0.12	1.27	0.00		0.00	
	2006	3.69	0.74	0.14	6.42	0.00		0.00		0.00		0.00	
	2007	1.44	3.17	0.15	0.43	0.00	0.53	0.00		0.44	0.77	0.00	
	2008	0.24	0.97	0.02	0.78	0.00		0.00		0.00		0.00	
	2009	0.12	1.58	0.05	0.99	0.00		1.35	2.36	0.00		0.00	
	2010	0.01	1.04	0.00	1.08	0.01	0.44	0.32	0.70	0.00		0.00	

Table A5: New England total annual incidental catch (mt) and the associated coefficient of variation by mesh category for bottom trawl and gillnet for each individual species. Herring NK represents unknown herring. Midwater trawl estimates are only included beginning in 2005.

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
Alewife	1989	4.22	0.69	0.32	1.64	0.12	0.98	0.00		0.00		0	
	1990	11.91	1.91	0.00		43.36	0.69	0.00		0.00			
	1991	3.21	0.74	0.57	1.28	0.24	1.17	0.00		0.00		0.00	
	1992	1.16	0.62	0.00		0.76	0.64			0.00		0.00	
	1993	33.75	0.61	0.00		0.06	1.89			0.00		0.00	
	1994	0.00		0.00		0.08	1.56	0.00		0.00		0.00	
	1995	2.10	1.37	0.00		0.00		0.00		0.09	1.07	0.00	
	1996	38.37	0.39	0.00		0.00		0.00		1.31	1.02	0.00	
	1997	10.05	3.17	0.00		0.03	1.39	0.00		0.00		0.00	
	1998	80.88	1.47	0.00		0.00		0.00		0.00		0.00	
	1999	2.96	1.24	0.00		0.00		0.00		0.00		0.00	
	2000	20.30	0.88	0.00		0.00		0.00		0.00		0.00	
	2001	88.28	1.10	0.00		0.66	1.22	0.00		0.00		0.00	
	2002	1.16	0.80	0.00	2.33	0.04	0.88	0.00		0.00		0.00	
	2003	38.21	0.58	0.00		0.65	0.40	0.00		0.03	0.66	0.00	
	2004	21.02	0.60	0.00	0.88	0.28	0.35	0.00		0.04	0.55	0.00	
	2005	11.53	0.84	0.00	0.13	1.45	0.94	0.00		0.02	0.56	0.00	
	2006	15.68	0.52	0.00		0.18	0.50	0.00		0.00		0.00	
	2007	258.45	0.41	0.00		0.93	0.65	0.00		0.00		0.02	1.41
	2008	31.31	0.87	0.00		0.53	0.28	0.00		0.00		0.00	
	2009	27.75	0.57	0.00		3.52	0.65	0.00		0.01	0.63	0.00	
	2010	26.81	0.43	0.10	1.81	1.71	0.18	0.00		0.02	0.51	0.00	0.84
American Shad	1989	38.90	0.89	0.00		6.53	0.33	0.00		0.00		0.00	
	1990	2.95	0.56	0.00		15.91	0.51	0.00		0.00			
	1991	6.87	0.50	0.28	1.31	63.63	0.33	0.00		0.00		0.00	
	1992	6.87	0.58	0.00		49.67	0.42			0.00		0.00	
	1993	38.25	0.68	0.00		11.42	0.41			0.00		0.00	
	1994	18.89	0.66	0.12	0.69	3.86	0.43	0.00		1.12	0.88	0.00	
	1995	1.24	0.83	0.03	0.99	5.25	1.18	0.00		8.85	0.29	0.04	0.84
	1996	0.36	12.72	0.04	0.00	0.64	1.07	0.00		27.82	0.48	0.00	
	1997	2.10	4.25	0.00		11.58	0.68	0.00		4.86	0.46	0.15	1.04
	1998	12.95	0.32	0.00		4.03	4.93	0.00		7.21	0.49	0.98	0.91
	1999	0.10	1.24	0.00		0.83	0.70	0.00		4.75	0.86	1.40	1.15
	2000	0.00		0.00		1.50	1.20	0.00		4.13	0.52	0.12	0.95
	2001	0.84	1.27	0.05	0.66	1.08	0.54	0.00		0.07	1.66	0.00	

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	2002	4.39	1.47	0.00		0.17	0.71	0.00		17.10	0.44	0.08	1.08
	2003	7.35	0.47	0.00	0.85	1.17	0.31	0.00		1.62	1.00	0.56	0.88
	2004	10.90	0.55	0.00	1.37	0.61	0.30	0.00		2.49	0.27	0.14	0.73
	2005	6.88	0.53	0.00	0.12	0.72	0.20	0.00		2.02	0.26	0.07	0.37
	2006	2.58	0.70	0.00	0.62	0.46	0.24	0.00		9.46	1.18	0.00	
	2007	0.75	0.49	0.00		0.70	0.26	0.00		27.86	0.52	0.00	
	2008	1.15	0.86	0.05	0.61	1.75	0.29	0.00		28.27	0.37	0.03	1.10
	2009	16.21	0.56	0.00		1.77	0.23	0.00		7.65	0.28	0.18	0.79
	2010	7.80	0.35	0.02	1.64	3.40	0.12	0.00		9.55	0.19	0.06	0.43
	1989	4.58	0.72	0.00		3.62	0.89	0.00		0.00		0.00	
	1990	5.79	1.66	0.00		13.85	1.42	0.00		0.00			
	1991	57.20	0.58	0.01	0.93	0.05	0.75	0.00		0.00		0.00	
	1992	85.38	1.46	0.00		0.47	0.72			0.00		0.00	
	1993	96.08	0.61	0.00		0.64	0.59			0.00		0.00	
	1994	32.94	0.37	0.00		0.05	0.63	0.00		6.64	0.84	0.00	
	1995	58.98	0.83	0.00		0.09	0.48	0.00		104.57	0.71	0.00	
	1996	1.53	1.35	0.00		0.00		0.00		0.23	0.73	0.00	
	1997	51.49	4.66	0.00		0.07	1.41	0.00		0.00		0.00	
	1998	0.00		0.00		0.00		0.00		0.17	0.72	0.00	
Blueback Herring	1999	199.81	0.61	0.00		6.74	1.83	0.00		0.00		0.00	
	2000	1.41	0.88	0.00		0.02	1.49	0.00		0.00		0.00	
	2001	41.48	1.00	0.00		0.03	0.97	0.00		0.00		0.00	
	2002	159.90	0.33	0.02	1.31	1.15	0.56	0.00		0.64	1.23	0.00	
	2003	272.92	0.62	0.12	0.46	5.97	0.35	0.00		0.01	0.96	0.00	1.36
	2004	49.61	0.60	0.02	0.80	4.47	0.53	0.00		1.77	0.71	0.06	0.54
	2005	14.73	0.75	0.02	0.16	1.01	0.38	0.00		0.23	0.80	0.00	0.90
	2006	2.55	1.01	0.12	0.77	0.48	0.40	0.00		0.00		0.00	
	2007	38.36	0.60	0.01	8.19	0.28	0.45	0.00		0.01	1.32	0.00	
	2008	13.47	0.85	0.00		0.26	0.41	0.00		0.02	1.31	0.00	
	2009	42.59	0.57	0.00		0.25	0.60	0.00		0.03	0.84	0.00	
	2010	8.59	0.46	0.07	0.48	1.13	0.41	0.00		0.07	0.39	0.00	
	1989	6.83	1.07	0.00		0.25	1.00	0.00		0.00		0.00	
	1990	10.95	1.90	0.00		207.24	1.09	0.00		0.00			
	1991	21.44	1.35	6.35	0.87	0.64	1.07	0.00		0.00		0.00	
Herring NK	1992	313.19	0.47	0.00		4.92	0.55			0.00		0.00	
	1993	9.70	0.81	0.00		5.05	0.66			0.00		0.00	
	1994	0.35	0.99	0.00		1.91	0.60	0.00		6.73	0.84	0.00	
	1995	44.36	1.69	0.00		0.60	0.40	0.00		3.69	0.59	0.00	
	1996	20.46	0.54	0.07	0.00	0.27	0.68	0.00		0.00		0.30	0.99

		Bottom Trawl						Gillnet					
		Small mesh		Med. mesh		Large mesh		Small mesh		Large mesh		X-large mesh	
Species	Year	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV	Catch	CV
	1997	61.89	4.64	5.20	0.62	0.38	0.77	0.00		0.04	1.02	0.04	2.28
	1998	0.00		0.00		0.18	1.27	0.00		0.00		0.00	
	1999	83.28	1.59	0.00		0.00		0.00		0.03	1.15	0.00	
	2000	14.31	0.70	0.00		0.44	1.48	0.00		0.00		0.00	
	2001	0.00		0.00		0.00		0.00		0.05	1.54	0.00	
	2002	73.95	1.91	0.00	0.77	0.35	0.73	0.00		0.00		0.00	
	2003	14.49	1.28	0.00		0.76	0.58	0.00		0.03	0.59	0.00	
	2004	9.24	0.64	0.00		0.22	0.59	0.00		0.02	0.60	0.00	1.16
	2005	2.97	1.34	0.01	0.12	0.23	0.29	0.00		0.16	0.55	0.01	0.90
	2006	57.15	1.50	0.05	0.63	0.33	0.57	0.00		1.98	0.56	0.27	0.99
	2007	72.27	2.94	0.00		0.15	0.51	0.00		0.00		0.00	
	2008	97.08	0.58	0.00		0.09	0.62	0.00		0.00		0.00	
	2009	14.70	1.51	0.00		0.30	0.39	0.00		0.63	0.62	0.00	
	2010	8.27	0.93	0.00		0.26	0.68	0.00		0.29	0.46	0.00	0.84
	1989	0.00		0.00		0.00		0.00		0.00		0.00	
	1990	0.00		0.00		0.00		0.00		0.00			
	1991	0.00		0.00		0.00		0.00		0.00		0.00	
	1992	0.00		0.00		0.00				0.00		0.00	
	1993	0.00		0.00		0.00				0.00		0.00	
	1994	0.00		0.00		0.10	0.63	0.00		0.00		0.00	
	1995	0.00		0.00		0.00		0.00		0.00		0.00	
	1996	17.26	1.24	0.00		0.00		0.00		0.00		0.00	
	1997	3.43	3.40	0.00		0.25	0.81	0.00		0.00		0.00	
	1998	38.40	1.48	0.00		0.00		0.00		0.00		0.00	
Hickory Shad	1999	4.40	0.70	0.00		0.00		0.00		0.00		0.00	
	2000	0.00		0.00		0.00	0.83	0.00		0.00		0.00	
	2001	66.32	0.45	0.00		0.20	0.76	0.00		0.00		0.00	
	2002	0.00		0.00		0.12	1.00	0.00		0.00		0.00	
	2003	2.53	1.05	0.00		0.06	0.93	0.00		0.25	0.48	0.01	0.84
	2004	7.98	0.79	0.00		0.06	0.39	0.00		0.04	0.84	0.00	
	2005	2.41	0.49	0.00	0.92	0.26	0.56	0.00		0.01	0.85	0.00	
	2006	9.19	1.14	0.00		0.13	0.32	0.00		0.02	1.88	0.02	1.05
	2007	1.74	0.43	0.00		0.24	0.36	0.00		0.28	1.33	0.00	
	2008	0.70	0.66	0.00		0.21	0.45	0.00		0.02	0.91	0.00	
	2009	1.88	0.83	0.02	0.30	0.15	0.35	0.00		0.17	0.61	0.00	
	2010	0.02	1.24	0.00		0.04	0.80	0.00		0.08	0.68	0.00	

Appendix 3 - FMAT Recommendations

Summary of September 20 Fishery Management Action Team (FMAT) meeting for

Amendment 14 to the

Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan.

Amendment 14 pertains to reducing the incidental catch of blueback herring, alewife, American shad and hickory shad in MSB fisheries. Amendment 14 also considers the larger question of optimal river herring and shad management. The following is a summary of the discussions of the Fishery Management Action Team (FMAT), at a September 20, 2011 meeting held by webinar, with respect to Amendment 14 Alternatives.

Attendees:

Didden, Jason (FMAT)	Rudolph, Tom
Ellis, Steven (FMAT)	deFur, Peter
Kelliher, Peter (FMAT)	Lyons Gromen, Pam
Hendrickson, Lisa (FMAT)	Stump, Kenneth
Curti, Kiersten (FMAT)	Cevoli, Kristen
Taylor, Kate (FMAT)	Pellegrino, Joanne
Richardson, Katie (FMAT)	Kaelin, Jeff
Stevenson, David (FMAT)	DiDomenico, Greg
Kitts, Drew (FMAT)	Paquette, Patrick
Szumylo, Aja (FMAT)	

Part I: J Didden first summarized the analysis conducted on catch of Atlantic (sea) herring, Atlantic mackerel, river herrings, and shads. From here on, RH/S = River Herrings/Shads

Incidental catch analysis (full summary found in working paper II)

Despite the fact that management is done by target species, the best way is to look at incidental catch is by discreet time, area, gear (including mesh size) strata. This avoids problems with the mixed/overlapping nature of the fisheries that incidentally catch RH/S. Considering incidental catch by a directed trip definition (e.g. 2,000 pounds of herring or 20,000 pounds of mackerel retained or landed) can confound data interpretation because: 1) fleets often overlap in catch/target; and 2) a vessel that fished for, but did not catch the targeted species could be missed. It should be noted that the observer program did not implement high-volume sampling protocols until 2005. For this reason, mid-water trawl estimates of incidental catch were only calculated from 2005 on. This also means that comparisons among all gear groups of such estimates can only be made from 2005 on.

Data sources included:

Northeast Fisheries Science Center (NEFSC) bottom trawl survey data

NEFSC Northeast Fishery Observer Program observer data

Vessel trip report data

Dealer landings data

Table 4 of Working Paper II summarizes estimated shad catch, by stratum, as a proportion of the total incidental catch during 2005-2010.

Overall by gear: Midwater Trawl (MWT): 42%; Large Mesh (5.5-8.0 in.) Gillnet: 27%; Small Mesh Bottom Trawl (SMBT): 26%

Overall by Area: Mid-Atlantic (M-A): 31%; New England (NE) 69%

By quarter: Quarter 4 NE MWT: 13%; Q1 M-A MWT: 12%; Q3 NE MWT: 8%; Q3 NE Gillnet: (8%)Q4 NE Gillnet: (8%) (50% of total catch from these 6 strata).

Table 5 of Working Paper II summarizes estimated river herring incidental catch, by stratum, as a proportion of the total incidental catch during 2005-2010:

Overall by gear group: Midwater Trawl (MWT): 76%; Small Mesh (<= 3.5 in.) Bottom Trawl (SMBT): 24%

Overall by Area: Mid-Atlantic (M-A): 44%; New England (NE) 56%

By quarter: Quarter 1 (Q1) M-A MWT: 35%; Q4 NE MWT: 16%; Q2 NE MWT: 11%; Q1 NE SMBT: 7%; Q3 NE MWT: 6%; Q3 NE SMBT: 5% (80% of total catch from these 6 strata).

When discards are subtracted from the incidental catch estimates, the amount of “kept catch” of Atlantic Herring, for 2005-2010, closely matches the landings values in the dealer database, generally validating the incidental catch estimation method. Comparisons for river herring and shad do not match in a similar fashion - this is not surprising given the reported discrepancies in reporting of landings of the four species.

River herring indices/distribution (full summary in working paper I)

Daytime relative abundance and biomass indices were calculated from NEFSC spring and fall bottom trawl survey data for blueback, alewife, and American Shad. Catches of hickory shad only occurred during some years and were too low to construct meaningful indices. It is important to note that the 2009-2011 indices were converted from Bigelow units to Albatross equivalents and uncertainties related to the conversion factor were not accounted for in the overall coefficient of variation (CV) calculations for those years.

Blueback: Fall CVs are very high and the percent of positive tows is low, making these indices less informative than the spring indices. Spring CVs are lower and the percent of positive tows is much higher. Fall relative abundance has been above the median since 2002 and the 2009 and 2010 indices were the highest of the time series. Spring relative abundance has been near or above the median since 2006.

Alewife: CV's are relatively low for Alewife with which also had a higher percentage of positive tows than Blueback. Fall relative abundance indices were generally below the median from 1975-2001and were above the median from 2002-2010.. The spring survey indices showed several periods of rises and falls: a decline during 1978-1990, increase during 1990-1999, decline again during 1999-2005, and increase during 2005-2010. Relative abundance indices for the fall of 2010 and spring of 2011 were the highest values in each of the time series.

American Shad: Survey indices were noisy with relatively high CVs and low percentages of occurrence, which made it difficult to discern any real trends in the indices.

It is difficult to interpret the NEAMAP (NorthEast Area Monitoring and Assessment Program) survey indices given the short time series. Also, because the survey covers a small portion of the entire survey area, it is not clear whether the indices are measuring overall relative abundance or migrations in and out of the survey area. Migrations could be in or out of estuarine or deeper waters compared to NEAMAP.

Maps indicating densities of each species from NEFSC spring and fall surveys, pooled by ten minute square, and across years, showed a wide distribution of RH/S and overlap of Atlantic Herring and Mackerel catches during both seasons.

Summary

Lack of status information: Catch of river herring appears higher than shad but given the lack of coast-wide productivity and biological reference points for these stocks, it is not possible to quantify the impacts of these incidental catches on stock status. This makes the impact analysis of alternatives extremely uncertain.

Overlap in managed/directed fisheries: Analysis of Atlantic herring and Atlantic mackerel landings suggests strong overlap between the two in terms of gear/mesh/area, especially in Q1 in the Mid-Atlantic.

Spatial-Temporal RH/S catch variability (observer data): GIS analyses of effort and incidental catch rates of river herring and shad combined, by gear group, suggest that while there are some areas that appear to have high catch rates of RH/S and low effort, incidental catch rates were generally highest in the areas where fishing effort was highest. The GIS analyses also indicated that areas with high incidental catch rates during one time period may not show the same pattern in another time period.

Spatial-Temporal Effort and Directed Catch Variability: Analysis of the spatial distribution of effort by paired midwater trawls showed substantial variation among years. Analysis of the spatial distribution of mackerel catches also showed substantial variation when looking at one month to the next or the same month across years.

Spatial-Temporal catch variability in the Northeast Science Center Bottom Trawl RH/S: The results of earlier analyses showing substantial year-to-year variability in trawl survey catches of RH/S were noted. The sizes and locations of standard deviational ellipses that defined the core distributions of each species indicated a high degree of inter-annual variability during both spring and fall.

PART II: Recommendations on Management Measures

1. Vessel Reporting

After further review of the potential biological and economic benefits of additional port-side sampling versus additional at-sea sampling, the FMAT recommends that a port-side program for sampling of the landings (i.e. landed weight by species) be resurrected into the DEIS. This would be structured as a 3rd party provider type program. NMFS has stated on the record that NMFS cannot furnish funding for new programs. Staff will create alternatives to cover funding options.

FMAT recommends making VTR submissions be required on a weekly basis throughout all MSB fisheries for general consistency purposes. There is a lot of overlap between permit holders for mackerel, Illex and Loligo/butterfish and most Illex permit holders will have to report weekly for other permits in the near future (especially if the Loligo and mackerel permit holders have weekly reporting requirements added through this Amendment). FMAT suggests Council include as a Preferred Alternative.

FMAT recommends deleting 48 hour pre-trip notification because the NEFSC observer program still needs 72 hours for observer placement. Notification should be preferred if a bycatch cap is preferred.

FMAT reaffirmed that VMS could be useful if area-based management is used but probably not worth the cost otherwise (though there would be some benefits for assessments and/or fleet communications to avoid river herring).

2. Dealer reporting.

2b: The FMAT acknowledged the benefits of vessels confirming dealer data, and more importantly, for additional enforcement of the current requirement for dealers to obtain VTR serial numbers from vessel captains to link the dealer and VTR data for each trip. This kind of cross-checking would need to be catalogued for quality assurance. The Regional Office's Fish-On-Line allows vessels to cross-check their landings, but is not currently mandatory, and not all vessels may have regular internet access. Changing VTR forms is cumbersome. As discussed above, alternatives for port-side sampling, by NMFS-certified samplers, to quantify dealer purchases of landings by species (potentially dealer discards also) should also be included in the DEIS (across MSB fisheries).

FMAT recommends removing the sort and weigh all fish alternative (2c1/2d1). Sorting all fish for all dealers is not currently practicable.

FMAT suggests that the other Alternatives (regarding weighing all fish) in Alternative Set 2 be included in the DEIS, but it is probably not necessary to identify preferred alternatives at this point within this alternative set.

3. Observer Optimization.

FMAT recommends 3b (reasonable assistance) and 3c (pumping/haul-back notification to observers) as preferred alternatives.

While the FMAT was unable to come to consensus on the issue of always placing observers on pair-trawl operations, J Didden checked with observer program regarding placement of observers on paired-vessels. The observer program is already placing observers on both vessels unless one vessel is only going to be operating as a "wing boat" (not taking on any fish) so this issue appears to already have been dealt with by the observer program.

FMAT recommends removing 3f and 3g (pumping a certain portion of a haul to avoid a "slipped haul designation) because they are unfeasible and/or unenforceable. J Didden confirmed with observer program that these appear very problematic from their perspective.

Regarding operational discards (OD), which for midwater trawlers are fish stuck in the net that can't be pumped into the hold, there is concern that we are dealing with minutia. The observer program staff has quantified OD for declared midwater trawl Atlantic herring trips during 2010 and found that they averaged 10.6% of the total discards of all species by weight (discards brought on board as well as discards not brought on board). Given the probable small benefit, FMAT was leaning toward dropping but additional information on operational discards will be included in analysis. Follow-up with observer program revealed that operational discards are now usually being brought onto the vessel and sampled in most cases on observed trips and vessels have been overall cooperative in this regard.

Regarding trip termination due to slippage, add option where vessels have an individual quota of slippage events.

4. Dockside Monitoring

4b (3^{rd} party landings weight verification) - FMAT suggests wrapping these into the "to be added" portside sampling alternatives (hiring of 3rd party certified sampler to obtain the following trip information: VTR serial number, permit number, vessel gear type, and to subsample landings and dealer discards by species, then scale them up to the trip level and give total landings and discard information.

4c (volumetric vessel-hold certifications for Tier 3 mackerel and Loligo moratorium permits) - good to have in DEIS, but not necessarily a Preferred Alternative

4d (Sustainable Fisheries Coalition bycatch avoidance project) - Given just involves a commitment to review, fine to identify as a Preferred Alternative.

5. At-sea observer coverage options

FMAT suggests adding 75% to fill out range.

FMAT has not yet been able to determine which coverage levels would result in various levels of precision. FMAT will try to have this for the October meeting. However, predicted coverage levels are based on the assumption that fishing effort and catch variability patterns for each fleet during the previous 12-month period are indicative of future patterns. To the extent that changes occur, predicted CVs may or may not be realized. For MWT herring limited access vessels in Southern New England, Amendment 5 analyses suggested that a 25% coverage level would result in a C.V. around 0.4-0.5, a 50% coverage level would result in a C.V around 0.2-0.3, and a 75% level of coverage would result in a C.V. around 0.2. These values are for river herring bycatch estimates.

FMAT recommended splitting alternatives out by gear type - as long as bottom trawl appears lower than mid-water trawl it might not need as much coverage.

The DEIS will note NERO concerns about any phase-in of industry funding (even the first years would need to be industry-funded to pay for additional coverage for this to be viable).

6. Caps

Probably should have a fleet-area cap (e.g., midwater trawls in New England) rather than using the regulatory definition of a "Mackerel" or "Herring" trip to define vessels that are subject to the cap. In other words, the greatest amount of impact on RH/S bycatch reduction would come from the implementation of a joint cap on both the herring & mackerel fleets. If one instituted just a cap on the mackerel fleets, one of two things would happen if the mackerel fishery was closed due to reaching the cap:

One possibility: mackerel fishery closes and the exact same fleet continues fishing in the exact same place (Mid-Atlantic Q1) and just retains the Atlantic herring catches and discards mackerel. Since catch per unit effort of the combined species would go down, overall effort could go up.

Other possibility: Q1 catches of mackerel and Atlantic herring in the Mid-Atlantic are so mixed that closing mackerel would effectively close herring.

FMAT discussed whether to remove alternatives to have a bycatch cap on shad since shad incidental catches are much lower than river herring catches, and since shad landings appear much higher than the incidental catches in the gear types examined. The FMAT also discussed the possibility of a catch cap that included all four species. No consensus was reached.

FMAT noted that setting the cap would be problematic as river herring would probably be a "data poor" stock w/o approved biological reference points.

7. Area-Based Management

FMAT recommended removing all mesh-based Alternatives because of a lack of selectivity information for both the target species and for RH/S in trawl fisheries. (make these alternatives considered but rejected)

FMAT noted that for other kinds of area-based management, if you eliminate effort in one area, you need to make sure that the effort is not merely displaced to another area with medium or high densities of RH/S and that large losses of the target species do not occur as a result of the closed area. Otherwise the fishery may just increase effort to make up the difference and you may end up killing more RH/S than in the status-quo case.

So the question then becomes can one quantify what would happen to the target and bycatch species if effort is shifted because of a closed area. The results of analyses to-date (spatial-temporal effort variability, spatial-temporal directed catch variability, spatial-temporal RH/S catch variability (observer data), and spatial-temporal catch variability of RH/S in the NEFSC spring and fall bottom trawl surveys, all suggest that it is not currently possible to determine whether any small closed area would lead to LESS, the SAME, OR MORE RH/S catch. To implement area-based management, a very large area would need to be used, and it would need to also encompass different areas seasonally to incorporate the herring fishery to be effective, to know that positive impacts resulted for RH/S (probably not practicable for closing an area if also trying to maintain some portion of the mackerel fishery). Area-based management (large areas) could be useful for fine-tuning observer coverage. Though again, if coverage is required in a small area and effort is displaced, it is not currently possible to determine whether any small closed area would lead to LESS, the SAME, OR MORE RH/S catch.

FMAT recommends removing Herring Amendment 5 small area management alternativea for same reasons as above as they may do more harm than good.

8. Mesh-based management

FMAT recommends removing all mesh-based alternatives because of a lack of selectivity information for both the target species and for RH/S in trawl fisheries.

9. Stock in the fishery alternatives.

There have been two primary outstanding issues beyond previous discussions (which will be incorporated into DEIS).

a. Could you add as a stock in the fishery but use ACL/AM flexibility provisions to defer to ASMFC for primary management as the NPFMC is considering for salmon and deferring to Alaska? There are several key differences however, that become evident when reviewing analysis for updating the NPFMC's salmon plan (http://www.fakr.noaa.gov/npfmc/). First, Alaska has a long history of well-documented successful/sustainable management with Salmon. Second, it appears that even in terms of just knowing how much is caught, the salmon situation is different in that RH/S landings and certainly catch (including discards) appear not as well documented (especially at the species level). ASMFC moratoriums will likely address most of the landings but not discards. Given these issues, and given that the ACL flexibility guidelines still require consistency with Magnuson (which the FMAT interprets to mean that alternatives to ACLs/AMs must achieve the same results), it would not appear that the Council could add RH/S as a stock in the fishery and then defer responsibility to cap mortality to the ASMFC at the current time.

b. How could complementary management measures work? In general, if there was a state retention prohibition (like Virginia will have as of January 1, 2012) across the states then ASMFC could request similar measures for Federal Waters. Note: Virginia's prohibition will also apply to vessels transiting state waters after fishing in the EEZ. The ASMFC could request complimentary management measures regardless of Council actions.

Appendix 4 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)	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	• Confusing for industry if different action alternatives are selected in each plan • If different approaches are selected, benefits to river herring may be diminished
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	

VESSEL REPORTING MEASURES

Measure	MSB Amendment 14	Herring Amendment 5 (*existing requirements in italics*)	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)*	NONE
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	• Need to ensure that third-party providers could handle a 48 hr notification (could just be one of requirements to apply • Should have the same pre-trip notification times within an FMP --For Herring, Am 5 – the option for a 48 hr requirement is different than that put in place in FW 46 --For MSB, there is a 72 hr notification for longfin already; may be good to be consistent • Vessels often target mackerel and herring on the same trip, best for industry and enforcement if requirements are the same
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	

DEALER REPORTING MEASURES

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	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	If action alternatives are selected, it is probably most convenient for mackerel/herring vessels and dealers if the requirements are the same for all 3 species.
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)	Consistency Issues
Safe Sampling Station	• 3b	• Section 3.2.2.2, Sub-Option 2A	Most convenient for observers in high volume fisheries if the same action items are selected in both plans
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	

AT-SEA OBSERVER OPTIMIZATION MEASURES

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	Consistency Issues
Slippage reports/affidavit from vessel operator	• 3e	• Section 3.2.3.2	If plans select incompatible measures from this range, vessels targeting both mackerel and herring could end up with a complicated layering of rules that could apply on the same trip.
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, Option4A	
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	
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	

AT-SEA OBSERVER COVERAGE REQUIREMENTS

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5	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%	• If the preferred coverage rates are different for mackerel and herring, there may be difficulties for the observer program • Administration for industry funding for mixed mackerel/herring trips will need to be developed
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	

MEASURES TO ADDRESS PORTSIDE SAMPLING

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	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	NONE
Vessel hold volume certification	• 4d: Tier 3 mackerel • 4e: Longfin/Butterfish moratorium	NONE	NONE

RIVER HERRING CATCH CAPS

Measure	MSB Amendment 14 (alternative number and description)	Herring Amendment 5 (alternative number and description)	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	If Atlantic herring fishing continues during a mackerel closure, the fleet could continue to catch river herring in the same location while discarding mackerel. Benefits to river herring may be diminished.
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)	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	NONE

Appendix 5: Northeast Fishery Science Center Report on Slippage and FISH, NK usage.

(Borrowed from NEFMC Herring Amendment 5)

5.3.2.1 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.

Observer Coverage Levels

Table 144 summarizes coverage rates from the NEFSC Observer Program for the 2007-2010 calendar years (also the herring fishing years) by gear type for all trips that landed greater than 2,000 pounds of Atlantic herring. 2008, 2009, and 2010 have seen relatively high levels of coverage across all major gear types in the fishery. Summary coverage rates based on the number of trips observed as a percentage of the number of trips taken are 4.1% in 2007, 14.8% in 2008, 20.6% in 2009, and 31.7% in 2010. During the 2010 fishing year (regardless of trip type), the Northeast Fisheries Observer Program covered trips for about 46% of all Atlantic herring landings.

Table 144 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2007-2010

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%

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 145 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 145 *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.

Table 145 Summary of NEFOP Observer Coverage Levels by Gear Type, January – December 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 146 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 146 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%

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 147 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 80). 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 81 and Figure 82).

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 147 and Figure 80 – Figure 83, 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 147 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 80, Figure 81, and Figure 82 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 80 and Figure 81).

Figure 80 Analysis of Comments Regarding Released Catch 2008/2009

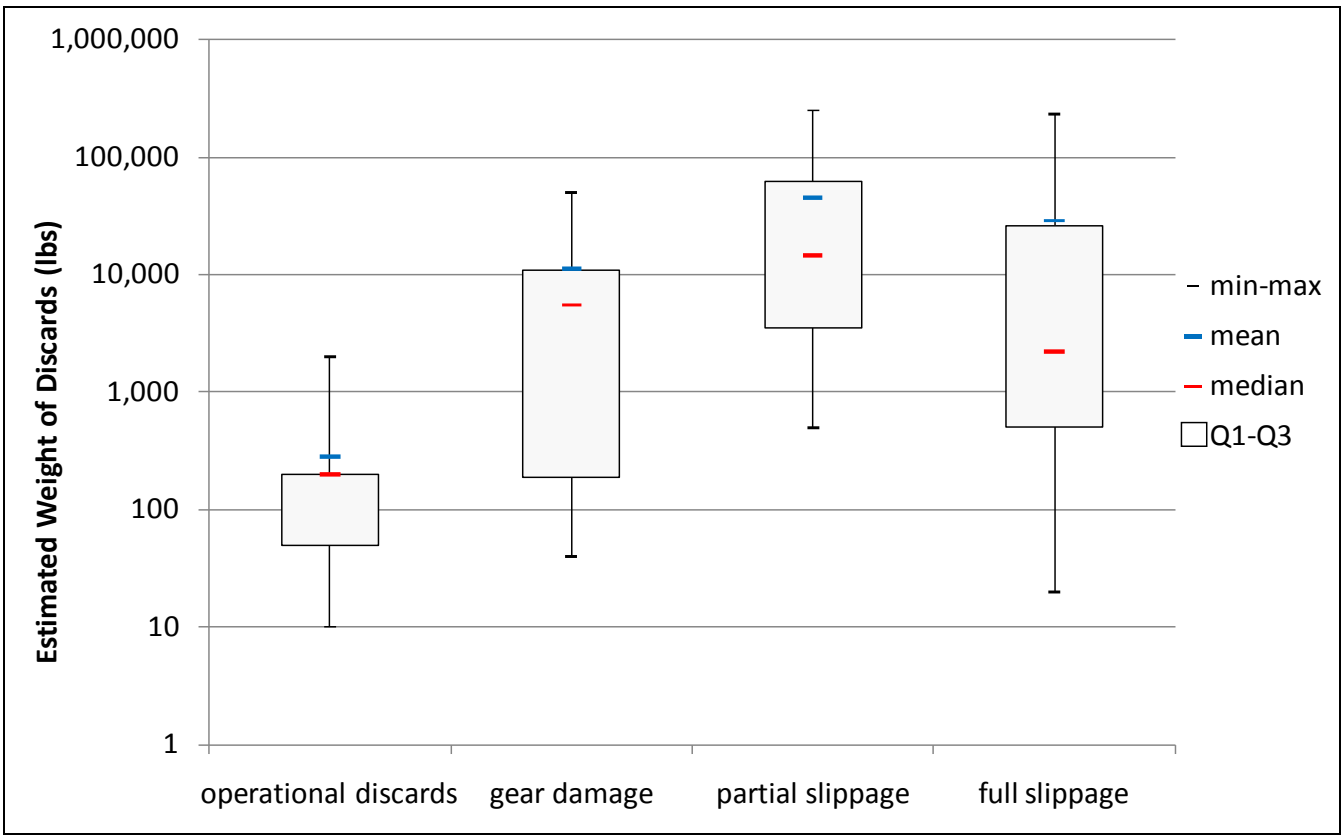


Figure 81 Analysis of Comments Regarding Released Catch 2008/2009 (continued)

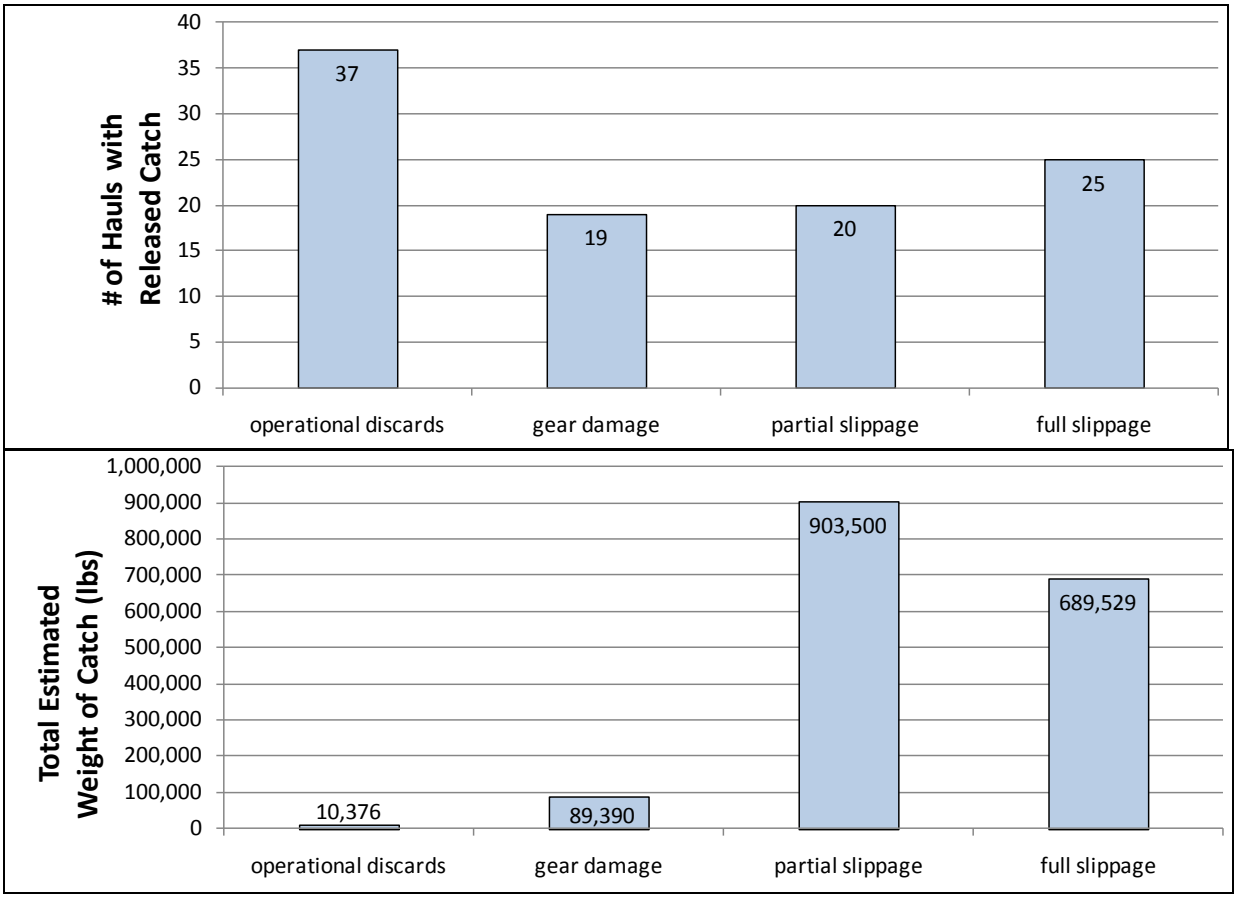
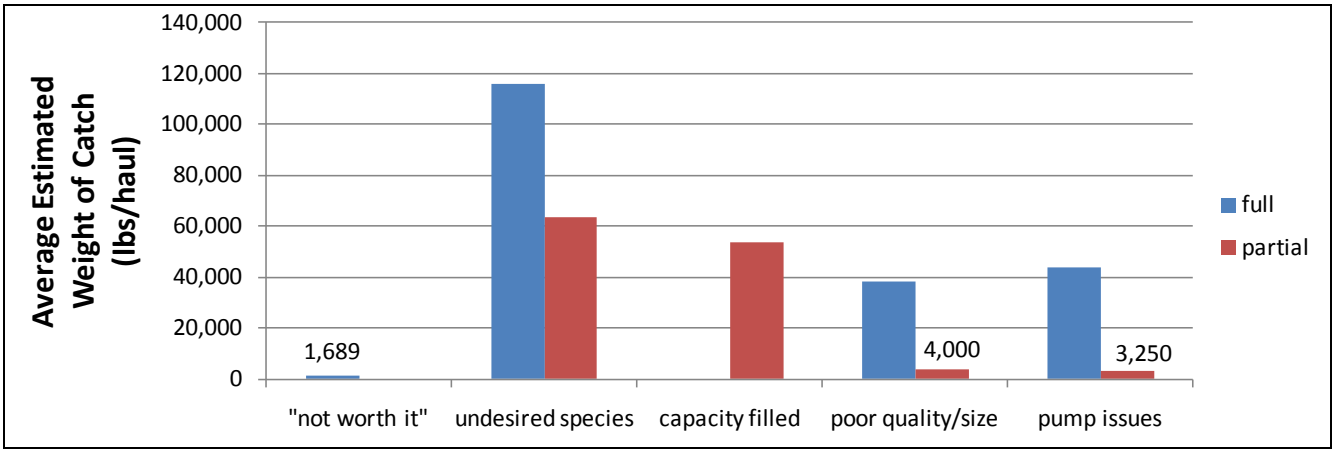


Figure 82 Information About Full and Partial Slippage Events 2008/2009



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 83). 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 83 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 83 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%

2010 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.

The NEFOP has 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; additional information from the 2010 discard log should be available by the end of this year and will be added to the final Amendment 5 EIS document.

Table 148 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 148 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 84 Observed Events on Limited Access Herring Vessels (by Number of Hauls) with Fish Not Brought on Board in 2010

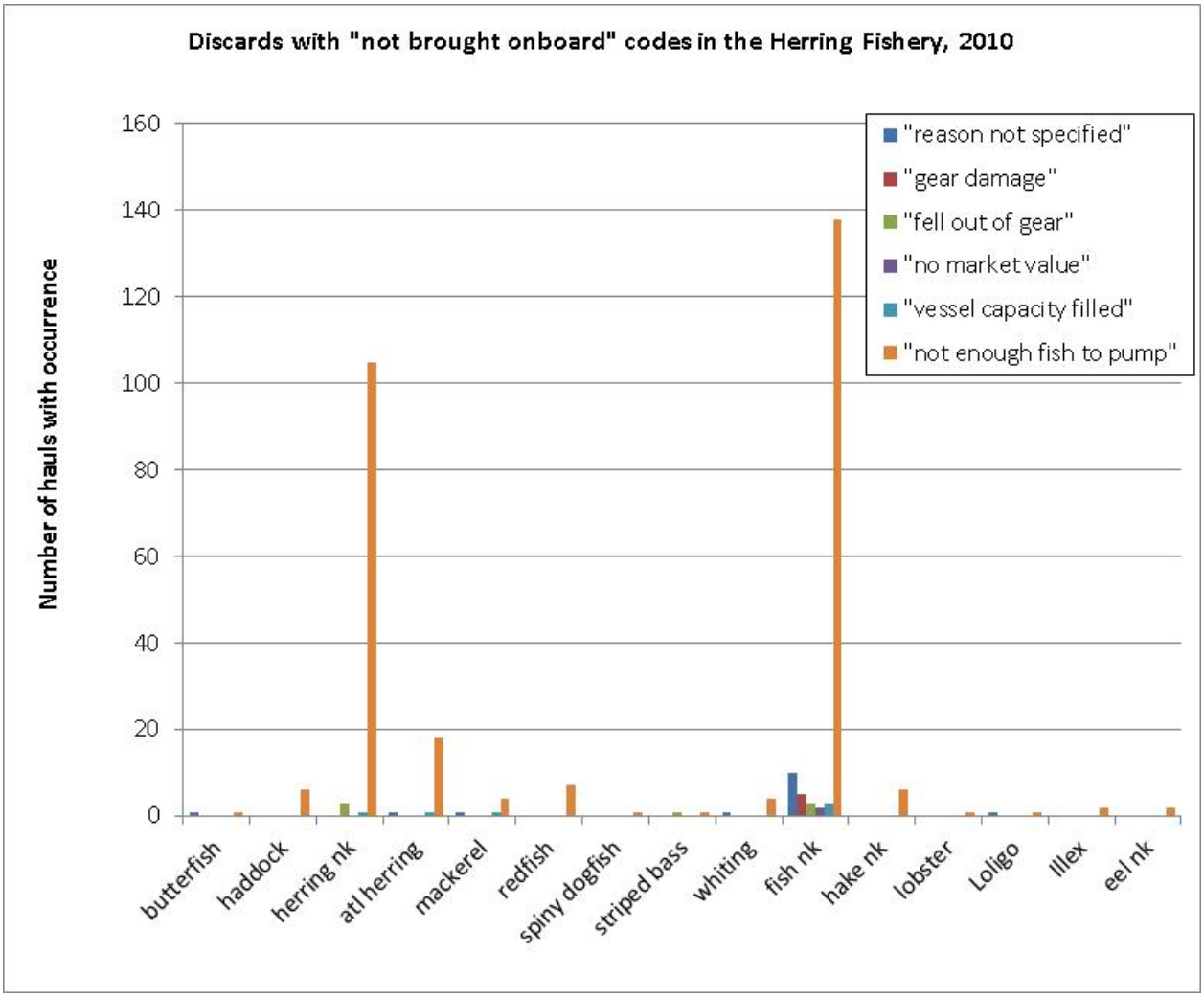
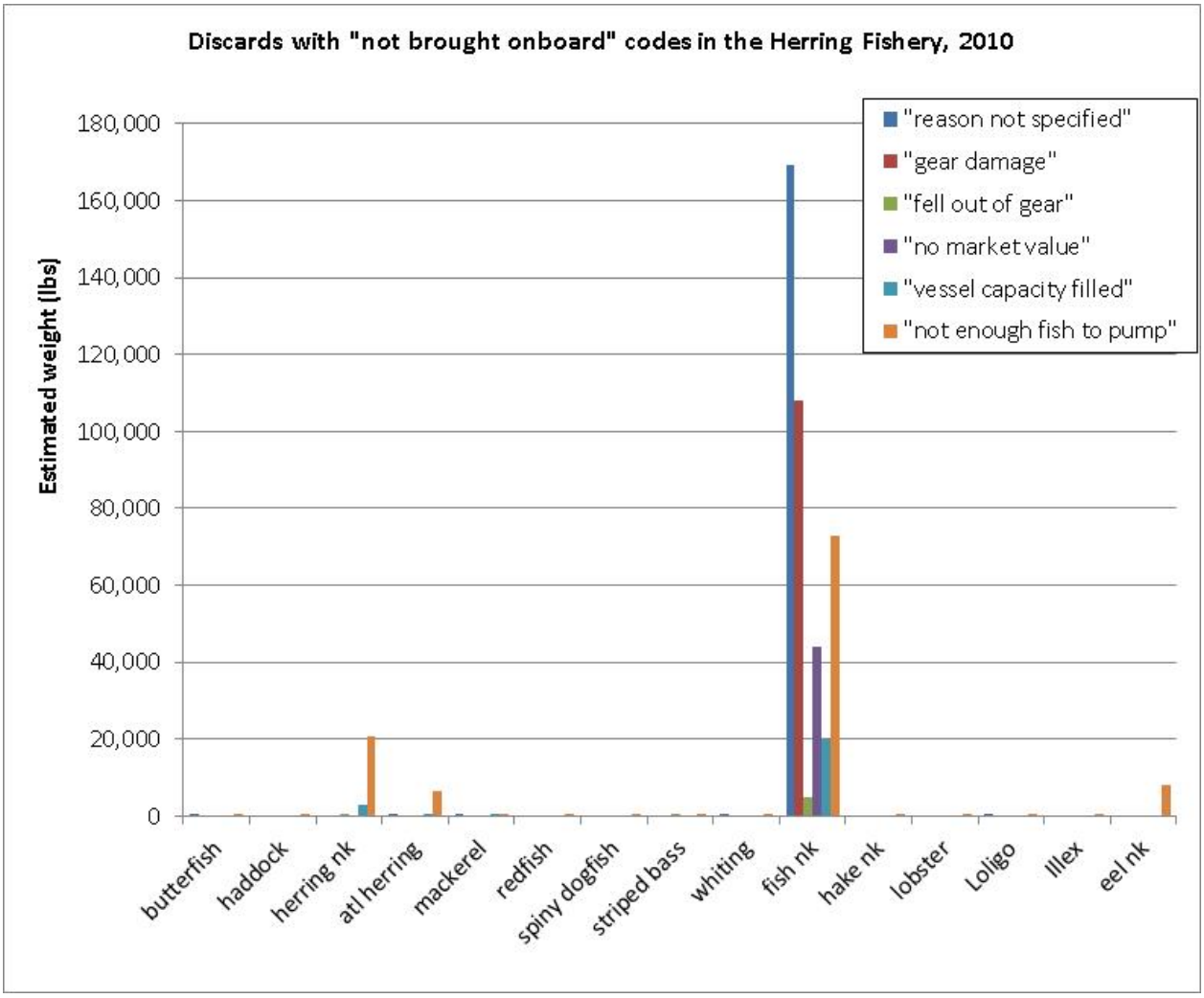


Figure 85 Observed Events on Limited Access Herring Vessels (by Estimated Weight of Fish in Pounds) with Fish Not Brought on Board in 2010



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. The 2009 and 2010 protocols for the use of Fish NK and Herring NK were consistent. Using the most recent data as an example (Table 149), the majority of Fish NK records in 2010 (54%) 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, Herring NK was documented on 122 hauls, and Fish NK was documented on 200 hauls. The majority of Herring NK (86%) was due to "not enough fish to pump" (operational discards). Sixty nine percent (69%) of Fish NK 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 149, Figure 86, Figure 87). 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. About ½ of observed Fish NK and Herring NK in 2010 was landed; in these cases, portside sampling would be 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. Nine percent (9%) of the Herring NK records 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 149 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

Figure 86 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Number of Hauls) in 2010

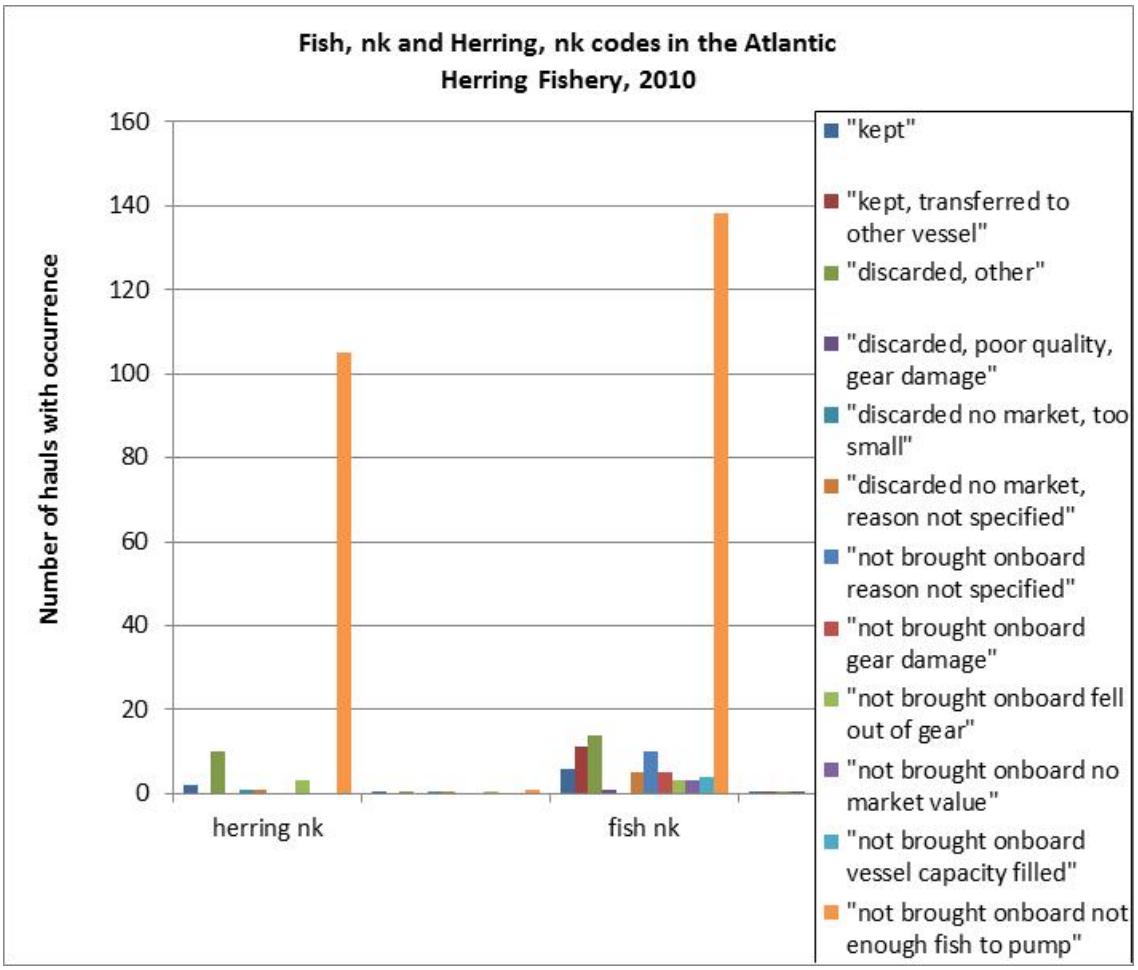
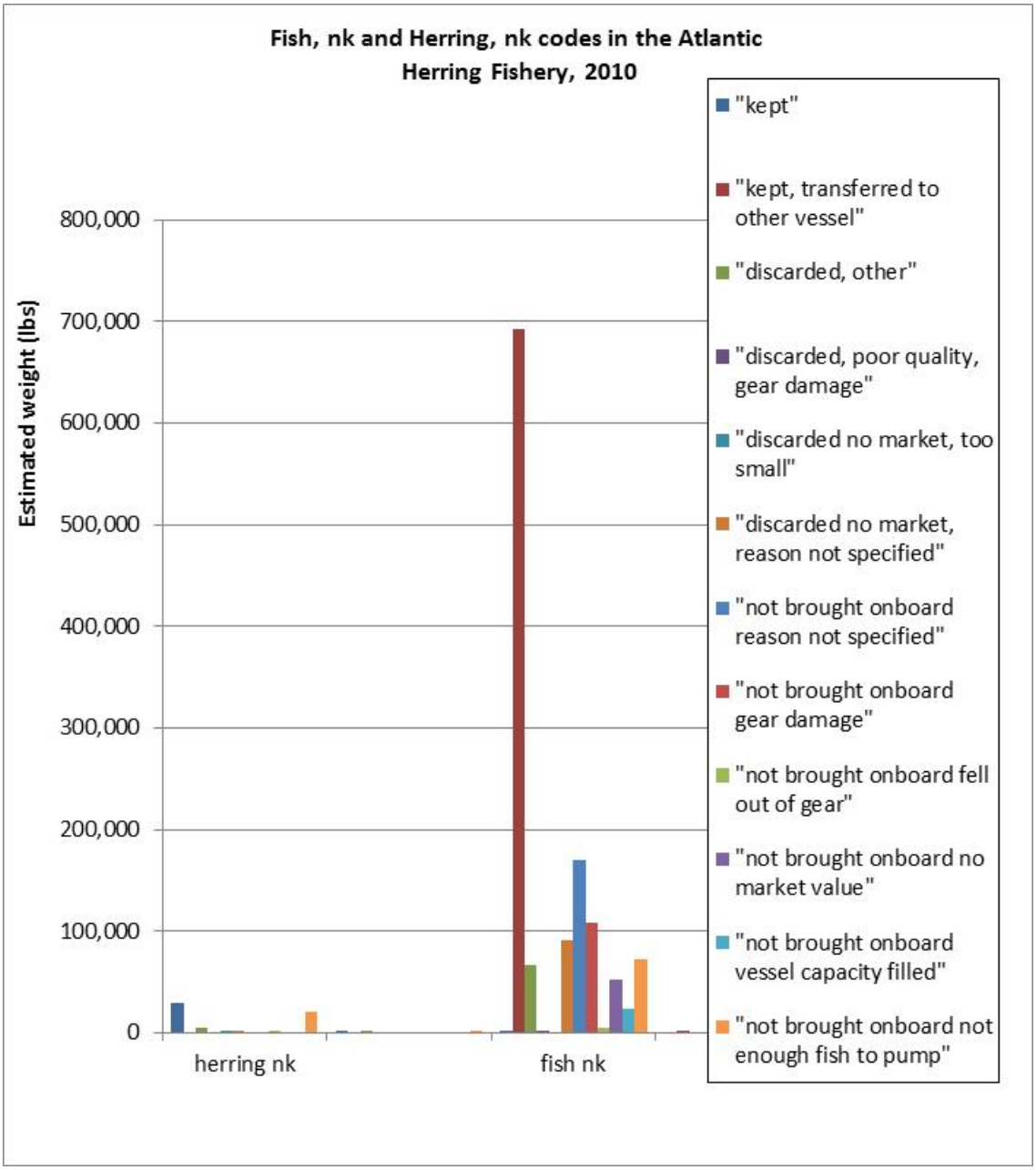
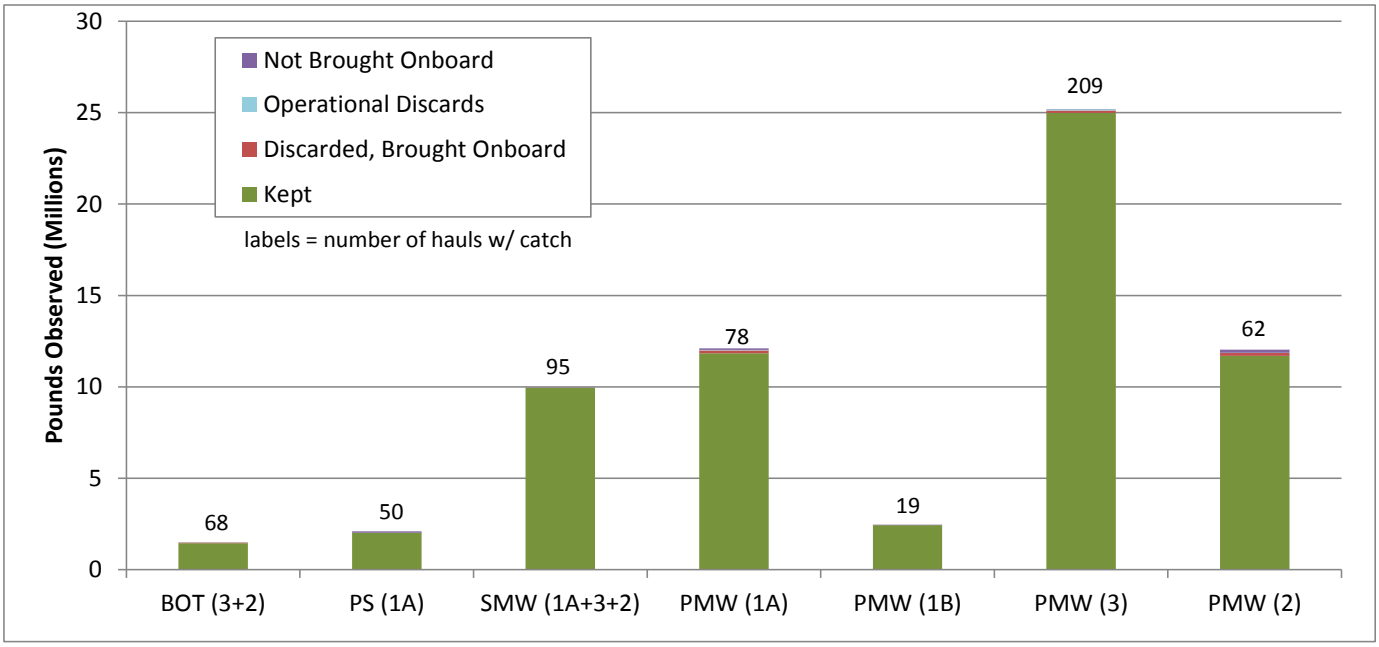


Figure 87 Use of Fish NK and Herring NK Codes on Observed Limited Access Herring Trips (by Estimated Weight) in 2010



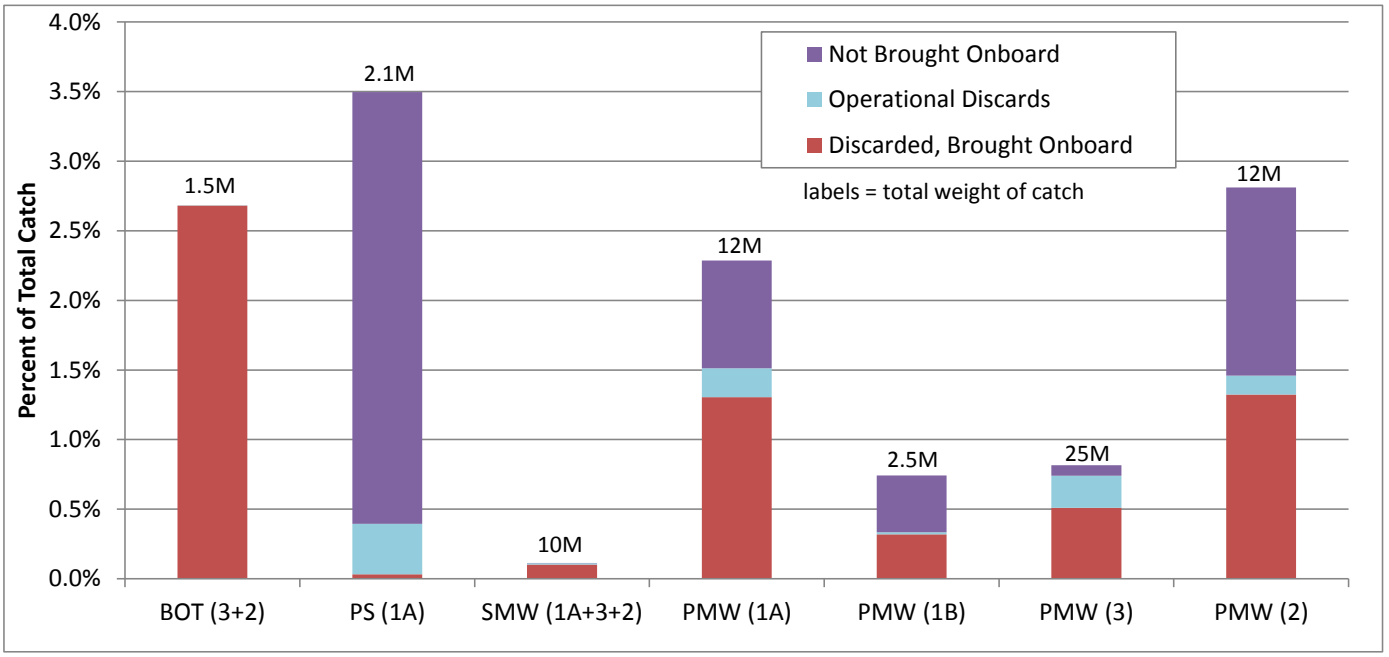
Available information suggests that the amount of fish estimated to be slipped in full/partial slippage events is less than 100,000 pounds. Information provided by vessel captains in 2008/2009, although incomplete, indicates that the estimated weight of partial slippage events (events for which captains 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 80 and Figure 81). 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 88 and Figure 89 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 88 and Figure 89 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 88 Summary of 2010 Observed Catch (Pounds) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition



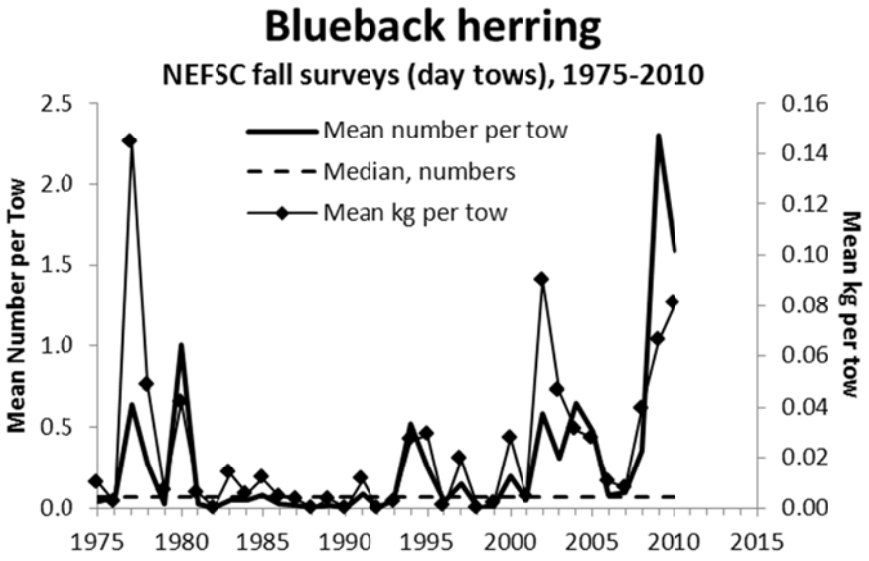
BOT – Bottom Otter Trawl; PS – Purse Seine; SMW – Single Midwater Trawl; PMW – Paired Midwater Trawl

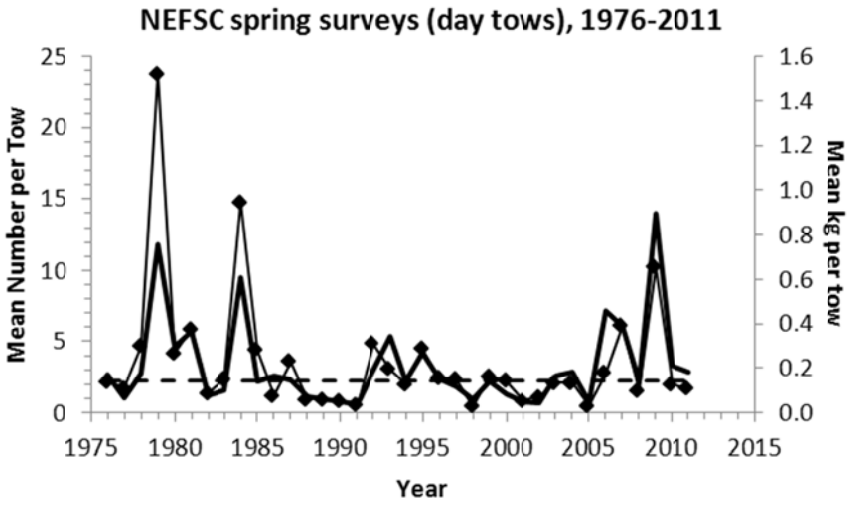
Figure 89 Summary of 2010 Observed Discards (as Percent of Total Observed Catch) on A/B/C Herring Vessels on Declared Herring Trips by Gear Type, Management Area, and Disposition



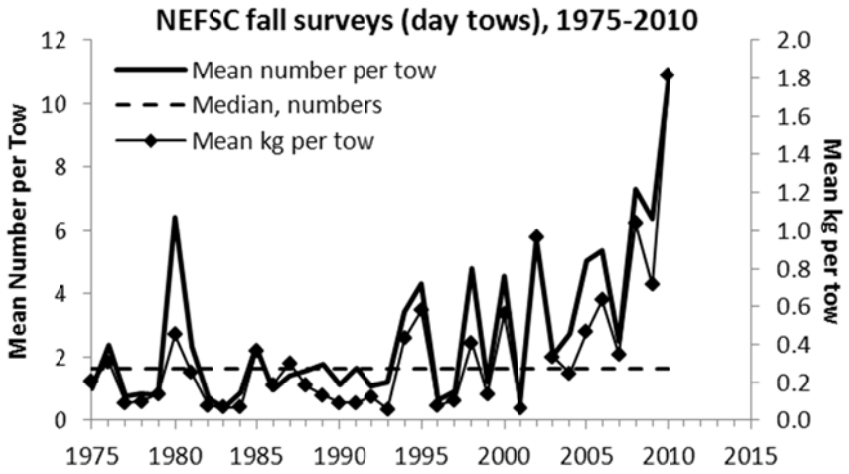
BOT – Bottom Otter Trawl; PS – Purse Seine; SMW – Single Midwater Trawl; PMW – Paired Midwater Trawl

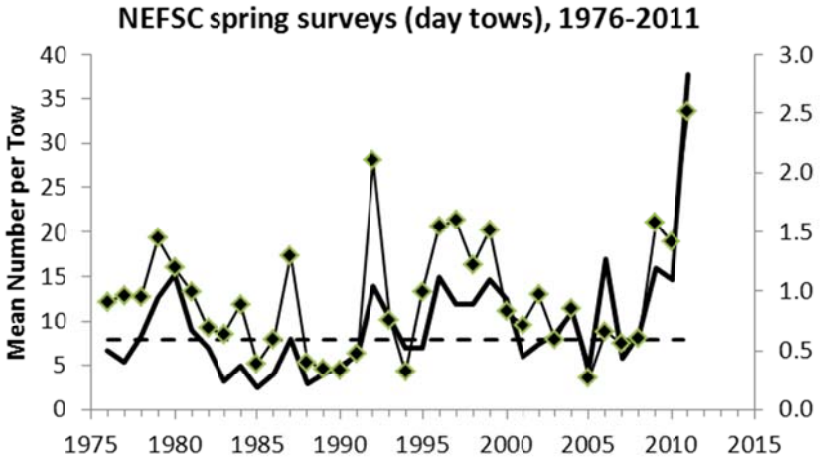
Appendix 6: Northeast Fishery Science Center Trawl Survey Data for RH/S

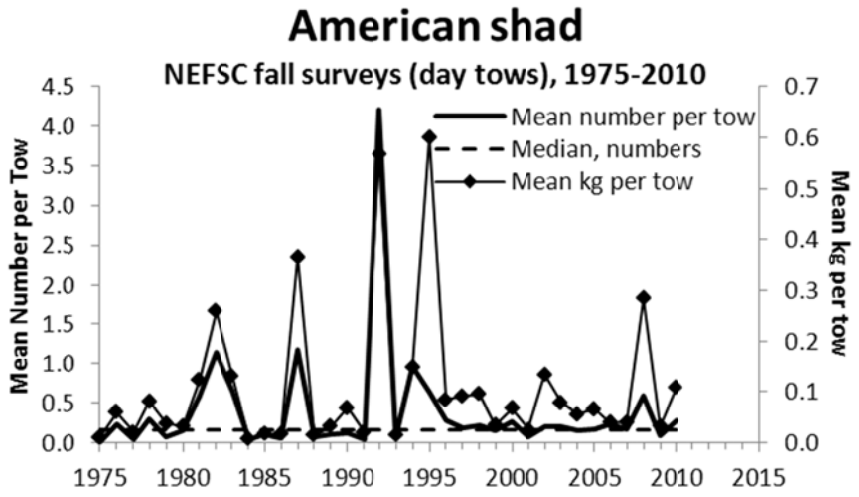


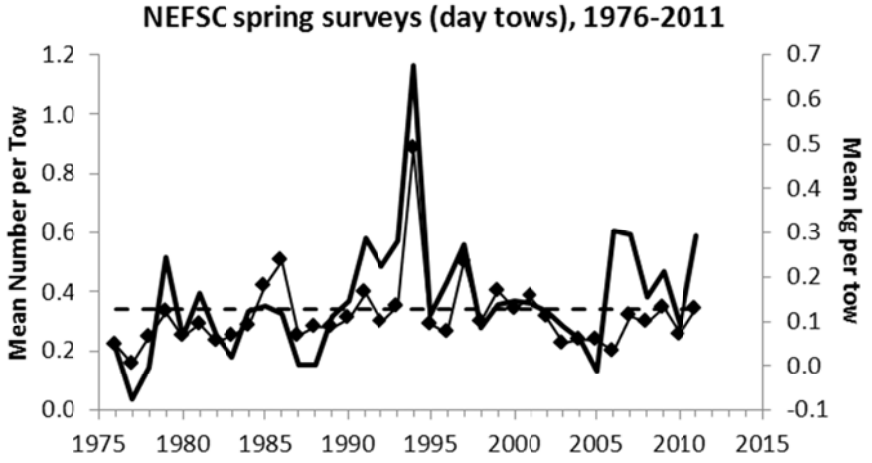


Alewife


NEFSC fall surveys (day tows), 1975-2010
Mean number per tow
Median, numbers
Mean kg per tow
Mean Number per Tow
Mean kg per tow
0
2
4
6
8
10
12
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1975
1980
1985
1990
1995
2000
2005
2010
2015


NEFSC spring surveys (day tows), 1976-2011
Mean Number per Tow
0
5
10
15
20
25
30
35
40
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1975
1980
1985
1990
1995
2000
2005
2010
2015


American shad
NEFSC fall surveys (day tows), 1975-2010
Mean number per tow
Median, numbers
Mean kg per tow
Mean Number per Tow
Mean kg per tow
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1975
1980
1985
1990
1995
2000
2005
2010
2015


NEFSC spring surveys (day tows), 1976-2011
Mean Number per Tow
Mean kg per tow
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
1975
1980
1985
1990
1995
2000
2005
2010
2015

Appendix 7: Summary of School for Marine Science and Technology (SMAST) and Sustainable Fisheries Coalition (SFC) Voluntary River Herring/Shad Avoidance Project

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. 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 project will test if oceanographic features can be used to indicate areas with a high probability of large catches alosines. The Finite-Volume Community Ocean Model (FVCOM) system will be used to hindcast ocean conditions. FVCOM is a verified prognostic coastal ocean circulation model that incorporates realistic time-dependent temperature projections and can identify oceanographic conditions on a daily basis. Sea surface temperature, bottom temperature, the difference between sea surface and bottom temperature, surface salinity, bottom salinity and depth are the initial variables that have been mapped on a monthly basis. The project will use Northeast Fisheries Observer Program (NEFOP) mid-water trawl and National Marine Fisheries Service (NMFS) bottom trawl datasets for alosine catch at sea information. Other data sources

may be used but these two datasets provide the best catch at sea information when timing, size, resolution (information on a tow by tow basis), and spatial uncertainty are considered. NEFOP catch at sea data has been linked to environmental conditions using a stepwise process within ArcGIS 10. Initial plots suggest alosine bycatch is associated with shallow depths and specific temperature ranges. However, the predictive power of these associations is unknown and results need to be further analyzed and expanded. The intent is ultimately to predict alosine hotspots amidst the distribution of Atlantic herring and mackerel, which could be avoided by vessels to reduce bycatch incidents.

The project relies on near real-time communication between fishing vessels, MA DMF and SMAST to circulate information regarding alosine hotspots and to relay this information to fishing captains before and during their trips. The first system was implemented during the 2011 winter mid-water trawl fishery (January through March) over an approximately 60x70 nm area off the coast of New Jersey identified as a high bycatch area by historic MA DMF port sampling, NEFOP data and the Atlantic herring Amendment 5 draft. Bycatch information in this area was accessed and shared with captains using a coded, grid system of smaller cells approximately 5x8 nm (10' longitude x 5' latitude) (Figure 1).

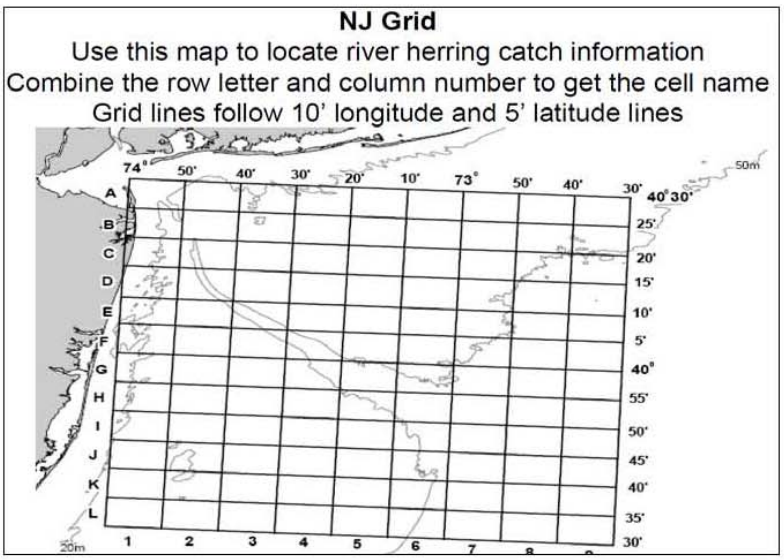


Figure 1. Grid distributed to captains and used to communicate bycatch information.

Catch composition was compiled through the MA DMF port sampling program which relied on electronic communications from captains and onshore managers that identified the location and time of vessel landings and departure. The program sampled just under 50% of all mid-water fishing trips landing in Massachusetts during the winter fishery and was an efficient (information relayed to SMAST in less than 48 hours) and accurate method to gather bycatch data. While at sea captains of participating vessels completed MA DMF tow logs (Figure 2). Although the completed logs gave tow by tow information the resolution of catch composition was trip level. Communication with onboard NEFOP observers was critical in identifying individual tows with alosines. The NEFOP has also agreed to share logs of trips with alosine bycatch with MA DMF/SMAST in a timely manner (about 5 days).

FOR OFFICE USE ONLY:

MarineFisheries
Commonwealth of Massachusetts

River Herring Bycatch Avoidance
NFWF Grant

MA DMF Trip Log

*To be filled out for EVERY mid-water trawl trip targeting herring or mackerel.

Vessel Name _____ Target Species _____ Date Sailed _____
Area(s) Fished: 1A / 1B / 2 / 3 Observer Onboard: Y / N Date Landed _____
Port Landed _____ Haul Weight _____ Sampled by DMF: Y / N

☐ Trip start notification email sent via boatracs to SEA.HERRING@STATE.MA.US containing:
- Target Species
- Observer Onboard: Y / N
- Intended Landing Port

Tow Information – This information will complement the Observer logs and provide data essential to assessing River Herring interactions through dockside sampling.

Tow #	Tow Location (Lat/Long:	Grid ID	Grid Cell #	Tow Date/Start Time	Tow Duration	RSW Tank #	Approx. Weight
1							
2							
3							
4							
5							
6							

When headed to port:
☐ Landing notification email sent via boatracs to SEA.HERRING@STATE.MA.US containing:
- Time and Port of Landing
- Hail Weight (trucks, tons or pounds)

Upon Landing:
MA DMF sampler will be collecting the following logs and information:
- **State** Copy of VTR
- Photocopy of Observers Haul, Catch Composition, Discard and Length Frequency Logs from trip (copies can be made for you by sampler)
- Hard copy of MA DMF Trip Log

***If your trip is not being sampled by a DMF sampler it is important that you fill out and retain this log. A DMF sampler will collect all Trip Logs during the next portside sample.**

Thank you for completing this worksheet and for your participation. If you would like the results of this portside bycatch sample please ask the sampler and a copy will be made available.

Figure 2. Trip log completed by captains and returned to MA DMF/SMAST upon landing

Based on the pace of the fishery weekly or bi-weekly advisories from SMAST worked best. Advisories classified grid cells as either having low, moderate, or high bycatch. Information was not reported for cells without tows and advisories only included cells with information less than 2 weeks old. Cumulative bycatch information was/is available through the SMAST website. Classifications were based on ratio thresholds intended to reduce the frequency of trips with over 2,000kg of alosines. The low incidence, high impact nature of alosine bycatch in the mid-water trawl fishery justifies this goal. From 2000 through September 2010 tows with greater than 2,000kg of alosines accounted for over 80% of NEFOP observed alosine mid-water trawl bycatch by weight despite accounting for only about 10% of the number of tows with 1kg of alosines or more. MA DMF portside sampling data also reflects this pattern on a trip level (Figure 3). For this project MA DMF portside sampling numbers were used to establish the

classification thresholds because it was the catch composition information source. Ratio thresholds were used instead of hard numbers to avoid biases created by small tow or trip sizes.

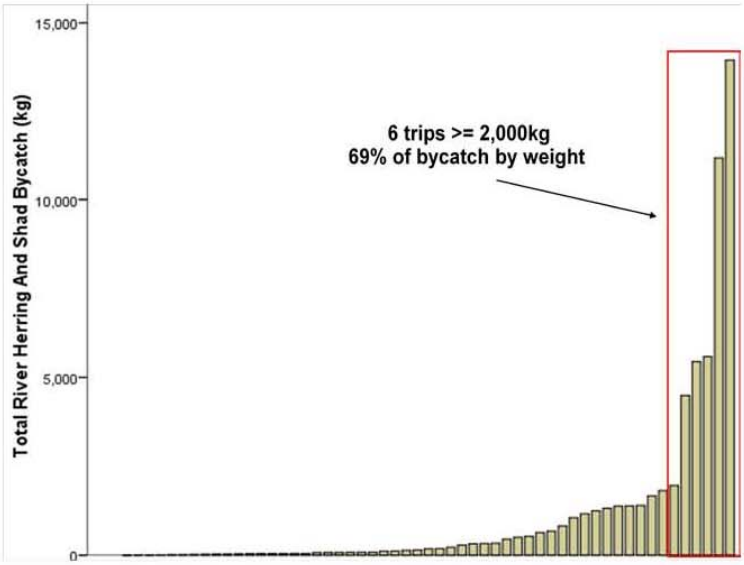


Figure 3. Seventy two mid-water trawl trips sampled by MA DMF portside sampling from May 2008-July 2010. This information was used to set the ratio thresholds used to classify areas as having high, moderate, or low bycatch.

Industry cooperation and the appearance of distinct spatial and temporal bycatch patterns within the avoidance area suggests this system may be effective at reducing alosine bycatch. Due to the number of trips within the avoidance grid, it is impossible to prove statistically from the results of one fishing season that bycatch advisories were not disregarded but high levels of cooperation and fishing patterns within the area suggest that advisories were not ignored. Eight of nine targeted vessels voluntarily shared detailed trip and tow information with the MA DMF and SMAST. The purpose of this high level of data sharing was to increase the fleets knowledge of the quantity, location, and timing of bycatch events. This suggests participation would be an

unnecessary burden unless the occurrence of bycatch was a concern. The overall behavior of the vessels within the avoidance area also provides evidence of cooperation. Though the shift of effort from the northwest part of the avoidance area to the southeast could be due to the availability target species, the timing of this shift in effort coincides with bycatch advisories and avoidance of a known high bycatch area (Figure 4). In total 5 cells were classified as having high bycatch with only one possibly reentered. Though reentry is not ideal, it does show that target species were present in both the northwest and southeast potions of the avoidance area simultaneously (Figure 4). After the reentry and subsequent advisory, effort was primarily in the low bycatch southeast region but trips were conducted in the cells between the northwest and southeast (row F) that previously had no effort (Figure 4). This suggests the vessels were interested in "filling in" the avoidance grid, possibly to test how far west they could fish while avoiding the high and moderate bycatch cells located in the northwest.

A total of 10 trips and 24 tows occurred in the study area with two tows and one trip classified as having high bycatch. These three events accounted for 75% of alosine bycatch observed by MA DMF port sampling and all occurred between mid-February and mid-March. A high bycatch region (northwest area of grid, above row H) and low bycatch region (southeast, row H and below) developed within the grid during the winter fishery (Figure 4.). The percentages of effort, target catch, and alosine catch in northwest and southeast regions (75, 75, 97 and 25, 25, 3 respectively) confirm this and also show both areas to economically viable. Though the timing and exact area of alosine abundance within the study area undoubtedly varies from year to year, these results suggests it is plausible for mid-water trawl vessels to be moved to areas with low alosine bycatch and adequate levels of target species using the scale of this study.

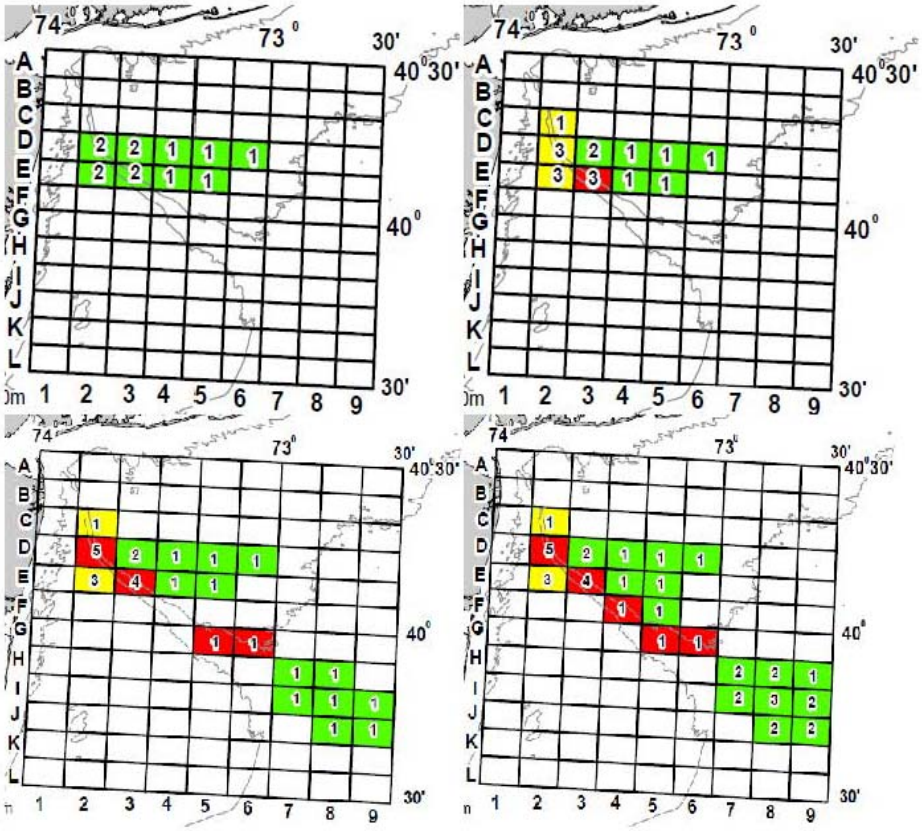


Figure 4. Cumulative bycatch information from 4 different time periods, from top left: 2/1/11, 2/17, 3/2,4/1. Numbers inside cells indicate the number of tows within each cell. Red indicates cells with high alosine bycatch while yellow and green indicate moderate and low respectively.

Appendix 8 - **Comments received on the DEIS before the June 2012 Council Briefing Book was created.**

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Richard B. Robins, Jr.
Chairman

Lee G. Anderson
Vice Chairman

800 North State Street, Suite 201
Dover, Delaware 19901-3910
Tel: 302-674-2331
Toll Free: 877-446-2362
FAX: 302-674-5399
www.mafmc.org

Christopher M. Moore, Ph.D.
Executive Director

M E M O R A N D U M

DATE: June 1, 2012

TO: Council

FROM: Jason Didden

SUBJECT: MSB Amendment 14

The Mackerel, Squid, Butterfish (MSB) Committee and MSB Advisory Panel will be meeting Friday June 8, 9am-noon via webinar (https://www1.gotomeeting.com/register/126160849) to review the alternatives in the document, review public comment, and get input from the Advisory Panel. The comment close for Amendment 14 is June 4, but the comments received to date are included following this page. A summary of the in-person public hearings, and any additional written comments received will be forwarded to the Council before the June 8 webinar. Once all public comments are received, staff may submit staff recommendations regarding Amendment 14 and these will be distributed before the Council meeting and posted to the web page noted below.

The MSB Committee will meet on Tuesday June 12, 2012, 9am-noon to consider actions on Amendment 14 to recommend to the Council. The Council will take up the issue on Wednesday. If requested, a hard copy of the Amendment's DEIS was mailed with the Council briefing documents and is available electronically at: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm.

There was also a joint Amendment 14 – Amendment 5 (Atl. Herring) technical meeting on May 22 that looked at coordination issues. A summary of that meeting is being finalized and will be distributed once complete.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 30 2012

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Mr. Daniel S. Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930-2298

Dear Mr. Morris:

In accordance with the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the National Oceanic and Atmospheric Administration's Draft Environmental Impact Statement (DEIS) for Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) (CEQ No. 20120106).

The purposes of Amendment 14 are to: 1) improve monitoring and observing of incidental River Herrings and Shads (RH/S catch); 2) consider ways to reduce RH/S catch; and 3) consider adding RH/S as managed stocks in the MSB FMP (i.e., as stocks in the fishery) so as to improve overall RH/S conservation. EPA believes that the DEIS provides an adequate discussion of the potential environmental impacts and we have not identified any potential environmental impacts requiring substantive changes. EPA has rated the DEIS as LO – "Lack of Objections." A summary of EPA's rating is attached.

We appreciate the opportunity to review this DEIS. If you have any questions please contact Jessica Aresta-DaSilva at aresta-dasilva.jessica@epa.gov or 202-564-1567.

Sincerely,

Susan E. Bromm

Susan E. Bromm
Director
Office of Federal Activities

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.

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).

**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

IDENTICAL AMENDMENT 5&14 COMMENT

533 identical comments (7 were altered)

Dear Mr. Moore,

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,

Y.D. jordan
1 nassau rd
montclair, NJ 07043

IDENTICAL AMENDMENT 14 COMMENT

6,622 identical comments submitted (61 were altered)

May 30, 2012

Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901

Dear Mid-Atlantic Fishery Management Council,

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 our 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 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, 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 designating river herring and shad as stocks in the fishery will take time. Therefore, the Council should also 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.

In addition, I strongly urge you to incorporate 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 the opportunity to comment and for your commitment to these priority reforms.

Sincerely,

Fiona Kinniburgh
26 E 2nd St
New York, NY 10003-9486

EXAMPLE IDENTICAL NY COMMENT

528 identical comments submitted (19 were slightly altered)

May 29, 2012

Amendment 14 Comments

Dear Comments,

For years, New York and other coastal states and communities along the Atlantic coast have worked tirelessly to restore culturally and economically significant species such as river herring and shad to rivers along the 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 coast-wide by 99 and 97 percent, respectively. In New York the Hudson River's historic shad fishery was recently closed to protect dwindling populations and a similar fate for river herring is likely. In addition, many other 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).

**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.

Sincerely,

Ms. annette bailey
753 James St
Syracuse, NY 13203-2108

INDENTICAL STOCKS IN A FISHERY COMMENT

Count of these received: 279

May 31, 2012

Executive Director Christopher Moore

Dear Executive Director Moore,

I urge the Mid-Atlantic Fishery Management Council and the National Marine Fisheries Service to begin managing depleted populations of river herring and shad as stocks in the fishery. Unmanaged catch of river herring and shad by industrial trawlers has contributed to a collapse of populations of these small but ecologically important fish.

With river herring and shad landed catch down 99 and 97 percent, respectively, most states have banned their harvest and the Fisheries Service is considering listing river herring under the Endangered Species Act. Yet mackerel and squid trawlers can catch millions of river herring and shad every year without restriction or even adequate monitoring. This is unacceptable; river herring and shad are clearly in need of conservation and management within the federal fisheries in which they're caught.

As the council finalizes Amendment 14 to the Mackerel, Squid and Butterfish Fishery Management Plan, I strongly urge it to vote in favor of adding blueback herring, alewife, American shad and hickory shad as stocks in the fishery management plan (Action Alternatives 9b-e).

I also request that you approve the following measures to immediately reduce the at-sea catch of river herring and shad:

** A catch cap for river herring and shad in the Atlantic mackerel fishery (Action Alternatives 6b-6c).
** 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 (Action Alternatives 5b4 and 3d).
** An accountability system to prohibit or discourage wasteful operational discards of unsampled catch. All catch must be made available to fishery observers for systematic sampling (Action

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).

Every year states and communities throughout the mid-Atlantic 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 Mid-Atlantic Fishery Management Council and the National Marine Fisheries Service must do their part and step forward to adequately regulate these important species.

Sincerely,

Mr. Peter Currie
631 W Olney Ave
Philadelphia, PA 19120-2219
(215) 276-3040

Many Near Identical Letters Were Received (see previous 4 sample letters). The next 6 pages detail additions made to letters that were not totally identical.

Unique Amendment 5&14

- As the holder of M.A.s in Marine Biology and Environmental Studies, I am a staunch defender of our marine resources and ocean and fresh water habitat.
- WHAT PART OF WATER TO SURVIVE DONT YOU GET??? STOP DESTROYING OUR OCEANS WITH YOUR OVER USE. WHO SAYS ITS YOUR TO RUIN ANYWAY?
- "Earth provides enough to satisfy every man's need, but not every man's greed." -- Mahatma Gandhi
- As a Professor Emeritus of Zoology and Environmental Science, I'm very concerned about the impacts of industrial fishing on river herring.
- THERE WILL NOT BE ANY MORE IF YOU DO NOT ACT TO CONSERVE THESE FISH!!
- Don't you know better by now? If you catch them all, your industry is dead. I'm very concerned about the impacts of industrial fishing on river herring.
- Industrial fishing is an unsustainable method of fishing and must not be supported. With regards to river herring, as bycatch industrial fishing is decimating the species. It must be stopped entirely.

Unique Amendment 14 only

- 3 quotes inserted into the comment
    - "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
    - "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
    - "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
- Do you think unmonitored fishing is wise?
- I am particularly concerned about the shad, which is a New Jersey fish that has been here historically and has had an economic impact on our state.
- Please consider the importance of every species in keeping the biodiversity and balance of the ecosystem in order.

- I am worried about our fish population
- WE NEED TO PROTECT OUR ENVIRONMENT...NOW!
- PERSONALLY, I AM STRONGLY OPPOSED TO ANY DUMPING OF "BI-CATCH" FISH. ALL CATCH CAN BE UTILIZED IN SOME WAY – PET FOOD, ETC. WE HAVE STRIP MINED OUR OCEANS AND WE WILL REAP THE PROBLEMS AND EFFECTS OF DEPLETION.
- The right hand does not know what the left hand is doing. Someone's got to look at this situation and say NO.
- We will reap what we sow and will suffer our own consequences no doubt.
- I know these fish don't pay you to rule in their favor, but consider that 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.
- American Shad were nearly extinct several decades ago due to water pollution - they were restored to healthy populations by a concerted effort and CAN BE AGAIN, BUT ONLY WITH A COMMITMENT TO DO SO...
- As a fish eater, this issue is important to me. I want to see our rivers and indigenous fish protected for future generations.
- DO WE HAVE TO TAKE EVERYTHING TO EXTINCTION?
- PLEASE TAKE THIS VERY SERIOUSLY
- As a biologist at Penn State University, I have participated in a research project on migrating shad and understand their ecological and economic importance. I am therefore concerned about this serious, ongoing threat to these already-depleted species that undermines our
  efforts to restore our estuaries and rivers.
- As a conservation professional I am concerned about this serious, ongoing threat to these already-depleted species that undermines our efforts to restore our estuaries and rivers.
- Can we please do everything in our power to protect our natural resources?
- The incidental catch of millions of river herring and shad by mid-Atlantic mackerel and squid fisheries remains largely unmonitored and unregulated, and is causing DEVASTATION throughout coastal foodchains.
- MAN IS DRIVING SEA LIFE TO EXTINCTION. POLLUTION, FISHING TOO MUCH, SPORT, TOXINS, GARBAGE AND OTHER FACTORS ARE KILLING SPECIES, LOSS OF CLEAN WATER IS CHANGING FISH BEHAVIOR AND BREEDING.UNTIL MAN REALIZES GREED IS NOT THE PLANET'SFIRST PRIORITY THESE CONDITIONS WILL ONLY WORSEN. CAN I BE THE ONLY PERSON WHO SEES THE DIRECTION OUR PLANET IS GOING IN???? I WILL NOT BE ALIVE WHEN THE PLANET AND IT'S WATERS AND ANIMALS AND SEA LIFE WILL BE DESTROYED- BUT- IT WILL HAPPEN UNLESS CHANGE IS MADE. NOW- NOT IN 10 YRS- NOW!!!!!!!!!!
- Once again, OVERFISHING is killing our oceans and the animals who call it home! THE OCEANS ARE ALREADY IN A SORRY STATE - PLEASE DO SOMETHING TO STOP THE DAMAGE.

- Greetings, My wife's family is from Jamesville NC. on the Roanoke River. Herring were a staple there. Now they are scarce. Industrial ocean fishing is too aggressive and must be curtailed.
- TO ALL OF YOU NUMNUTS THAT ARE DESTROYING STUFF IN THE WORLD HAD BETTER DAM SIGHT REALIZE THAT YOU CAN'T EAT MONEY!
- Imagine my surprise to learn that shad are not already extinct!
- I wonder what the people that deplete resources for living think they are going to do or leave for resources in the future.
- Please protect the supplies of river herring and American shad at sea from further dangerous depletion.
- George Washington was correct in his worries of the ecology. Interesting reading in his writtings. This is not the time to shy away from protecting our waters.
- Please! Give urgent attention to the preservation of river herring and shad, as their populations have declined to a dangerous level.
- Fisheries throughout the world are being reduced by overfishing and loss by unintended catch. We can not afford to continue destroying our aquatic resources. This is a matter of concern for the environment as well as for mankind's welfare. Everything is connected.
- During the Depression, my mother's family on Albermarle Sound in North Carolina got by in part because of netted menhadden. I grew up hearing about the amazing spawning runs that came up the Sound until the Second World War. Unfortunately, during WWII, the fish population crashed, and has struggled ever since. Such damage can be difficult to repair.
- AS A FISHERMAN AND AN ENVIRONMENTALIST I AM SHOCKED THAT WE HAVE ALLOWED OUR FISHERIES TO BE DECIMATED. IT'S WELL BEYOND TIME TO PUT A STOP TO THE ONSLAUGHT.
- Fishing is in my blood. Many of my relatives were fishermen and some are still fishing. This issue is important to me and others like me -- the families of fishermen.
- DO NOT KILL OFF OUR RIVERS OR WHAT IS IN THEM!
- S0-called by-catch, also called "unintended" catch, is terribly destructive to "bait" for larger fish. The huge range of death & destruction for smaller species must be addressed for the longterm health for fisheries everywhere. PA contributes to two (2) significant watersheds that impact many other biodiversite marine livelihoods: Delaware Bay & the Chesapeake and each in turn impact the Atlantic Ocean. A broad spectrum overview is needed to encompass immediate and extended species for healthy outcomes. N.J., Maryland and VA must be included & cooperatively participate.
- Come on, how can any life in the sea survive if this basic building block of the food chain is exterminated.....
- Virginia would not be Virginia without the shad. And how could politicians dream of conducting business without the kickoff of the shad planking season??? I am a

native Virginian and still own property there, so I have a keen interest in all things that affect the state where my heart always will reside.
- EXTINCT IS FOREVER~!~!~!~
- My family and I are truly concerned about this. We need to take this very seriously.
- Future generations of people and future years for our natural resources need to be progtected. Short term decisions will mean long term losses.
- Please protect river herring and shad. Even though they are small fish, they play an immensely important role in the health of coastal ecosystems.
- As an environmental history professor, I am very conscious of the significance of our river herring and shad populations and their overall place in our environment. Please protect them! Thank you.
- The health of our costal fisheries is of concern to all citizens. A sustainable ecosytem is necessary both for fishermen's economic health and for the incorpoation of fish in a healthy diet.
- I live next to the Herring Run river, but in the 27 years I have walked it banks I have yet to see a herring. It is said that at one time the river was thick with migrating herring in the spring. What an amazing sight that must have been!
- As the Ramapo River Watershed Keeper and someone interested in the health of the oceans and the the Hudson River Estuary, I endorse the views expressed below:
- The Chowan river near my hometown was completely dead. With luck and skill it was brought back. As of now, we are "waiting for the herring to run", the last step in recovery. Herring take a long time to overcome pollution. Protect them.
- Please institute a catch shares system to manage the herring and shad populations. This has been used successfully in many other fisheries. http://www.edf.org/oceans/catch-shares

Unique New York Comments

- Please protect river herring and shad. They are vital to the health of our rivers and the economic vitality of our communities.
- I am an Ursuline Sister living in New York, and Riverkeeper and other organizations have helped me to see the importance of protect endangered species.
- I want the fisheries of the Hudson River to survive and flourish so my daughter can witness great fish runs and eat local fish caught by local fishermen and women. Please take a great step towards that by decreasing bycatch.
- These fish not only are symbolic of our heritage, but more importantly are necessary to the functioning of a healthy marine ecosystem.
- You have an opportunity to make a difference in the future. Show me you can be a strong leader.
- This is an economic issue! These fish are the basis of the food chain and therefore the while Atlantic fishing industry! Short term gains for a few companies will cost us all (including those gaining now) the future of a sustainable fishery!

- I know that as a neighbour to the U.S., and not a citizen, I cannot effect the political system, but when it comes to the ecosystem of which we are all a part, there can be no boundaries, as a problem in one area, however isolated, will eventually (and sometimes immediately) affect all of us.
- As a follower of St. Francis,who expressed concern and love for all of God's creatures, I write to express my concern for river herring and shad populations that are at historically low levels, and are truly an endangered species. My concern is heightened when I think of Indian Point and the number of small and feeder fish who are caught or killed at the water intake areas as water is pumped into the plant for cooling purposes.
- In New York the Hudson River's historic shad fishery was recently closed to protect dwindling populations and a similar fate for river herring is likely. Remember as well that striped bass, also important culturally and economically to New York, follow these fish up the river to spawn.
- Stop killing fish and disgarding them at sea. This is an obnoxious, atrocious, and outragous practice, performed while seafood prices are extremely high and fish stocks are dwindling.
- I am concerned about the severe decline in the herring and shad population in the Hudson River.I live near the River and appreciate its beauty, as well its economic gift to the people along the River.
- As a New Yorker, I long for the day when we can again claim a healthy, robust Hudson River full of fish.
- Please restrict the by-catch of river shad and red herring so that these important, if under-appreciated fish can survive and sustain the ecosystem that depend on them in plentiful and consistent numbers. You have all the information needed to make the informed decision to save these important species. You have all the mandate behind you in making the right decision for the American public. You have all the reason necessary to take steps to prevent this base of the food chain and our fishing economy from becoming extinct. Please have the will to do so, with the enthusiastic support of many of us who care.
- Please protect the threatened river herring and shad from Ocean bycatch. They play a huge part in our coastal ecosystem. River herring and shad must be protected at all costs.
- I am worried about the health of the fish that call the Hudson home, many of which are on the brink of collapse.
- As a recreational fisherman in New York City I have long enjoyed fishing for Striped Bass in the Hudson River, Brooklyn and Long Island. I know first hand the positive results fishery management has had on the Striped Bass Population. I have come to appreciate the role Herring and Shad play in the food chain as their well as their historical significance. I believe the conservation actions described below will help the current threat faced by the dwindling number of Shad and Herring. I hope these action can help preserve these fish for my children's generation.
- Please, do the right thing for the oceans and rivers that provide us with fish. Stop the needless waste of these important species. It's up to you.

- As a resident of the Hudson River Valley, where the shad and herring run is a storied part of the culture, I am very concerned about the future of these fish. I know commercial fishermen personally who can no longer fish for shad, and I'm concerned that river herring on the Hudson are still being overfished for bait. While New York has taken and will take action to reduce fishing impact in the Hudson, we must enact strong regulations in interstate waters to protect and restore these fish populations. That's why I support Riverkeeper's effort, and the letter pasted below.

Mailing Address:
P.O. Box 764
Wakefield, R.I., U.S.A. 02880
PHONE: (401) 782-1330

DEEP SEA FISH OF RHODE ISLAND INC.
"SEA FROZEN PRODUCTS"

Plant Address:
65 State Street
Narragansett, R.I., U.S.A. 02882
FAX: (401) 782-4011

22 May 2012

MAFMC
800 N. Dover St.
Suite 201
Dover, DE 19901

REF: Amendment 14
Hand delivered at Public Hearing Warwick, RI

Council Members,

River Herring and Shad (RH/S) are anadromous species. The success of the spawning stock rests primarily within inland waters of the various coastal states along the eastern seaboard. A large part of the success or failure of the biomass is predicated on access to traditional spawning areas governed by individual States. These grounds have been permanently degraded by a variety of manmade obstacles such as dams and pollution. These are the issues that must be overcome in order to revive the stock.

This Amendment wrongly attempts to put the burden of inland ecosystem degradation on the commercial fishing industry. The fact that little or no evidence exists to support such a claim makes any of the Alternative Sets outlined in the Amendment both unneeded and unwarranted.

As the Council is also aware, the Mackerel Squid and Butterfish complex is currently managed with a minimum of scientific data. To include RH/S in the same management scheme would be of little or no benefit.

The RH/S fishery is already managed by individual States. The commercial industry is already overseen by At Sea Observers in a variety of fisheries, and both federal and states entities monitor dockside operations. This, combined with "grass roots efforts to collect baseline data for science" (savetheriverherring.org) is enough to monitor RH/S activity.

Given the efforts already in place regarding RH/S, I strongly urge the Council to recommend "No Action" on all the Alternative Sets 1-9 as outlined in the Public Hearing Document.

Sincerely,

Eric Reid
President
Deep Sea Fish of Rhode Island, Inc

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

May 17, 2012

Christopher M. Moore Ph.D., Executive Director
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901

RE: Amendment 14 for River Herring Protection

Dear Executive Director Moore:

For years, our coastal New Jersey communities have worked tirelessly to restore culturally and economically significant species such as river herring and shad to rivers along the New Jersey 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. We are 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, New Jersey has 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 options with the most positive biological impact:

1. Incorporate river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. **(Alternative 9b-9e)** This action would afford river herring and shad direly needed conservation and management measures.

2. Adopt an interim 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.

3. Implement 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).**

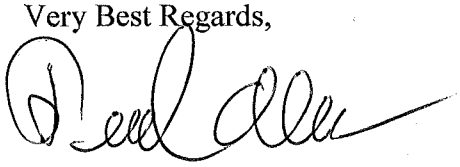
4. Adopt an accountability system to discourage the wasteful dumping of unsampled catch. All catch, including "operational discards," must be made available to fishery observers for systematic sampling **(Alternative 3j with operational discards prohibited).** If dumping is allowed, include a fleetwide limit of 10 dumping **events (Alternative 3l and 3n)** and require vessels that dump to take an observer on their next trip **(Alternative 3o).**

5. Adopt a requirement to weigh all catch. **(Alternative 2c-2f).**

The river herring and shad resource that is an essential food source to animals like striped bass and osprey, has been undermined to the point that river herring is currently being considered for protection under the Endangered Species Act. Since the most recent river herring stock assessment concluded that they are depleted and need fisheries management, we ask that you take all the urgent actions necessary to protect these species from total collapse and extinction and bring them back to significant abundance.

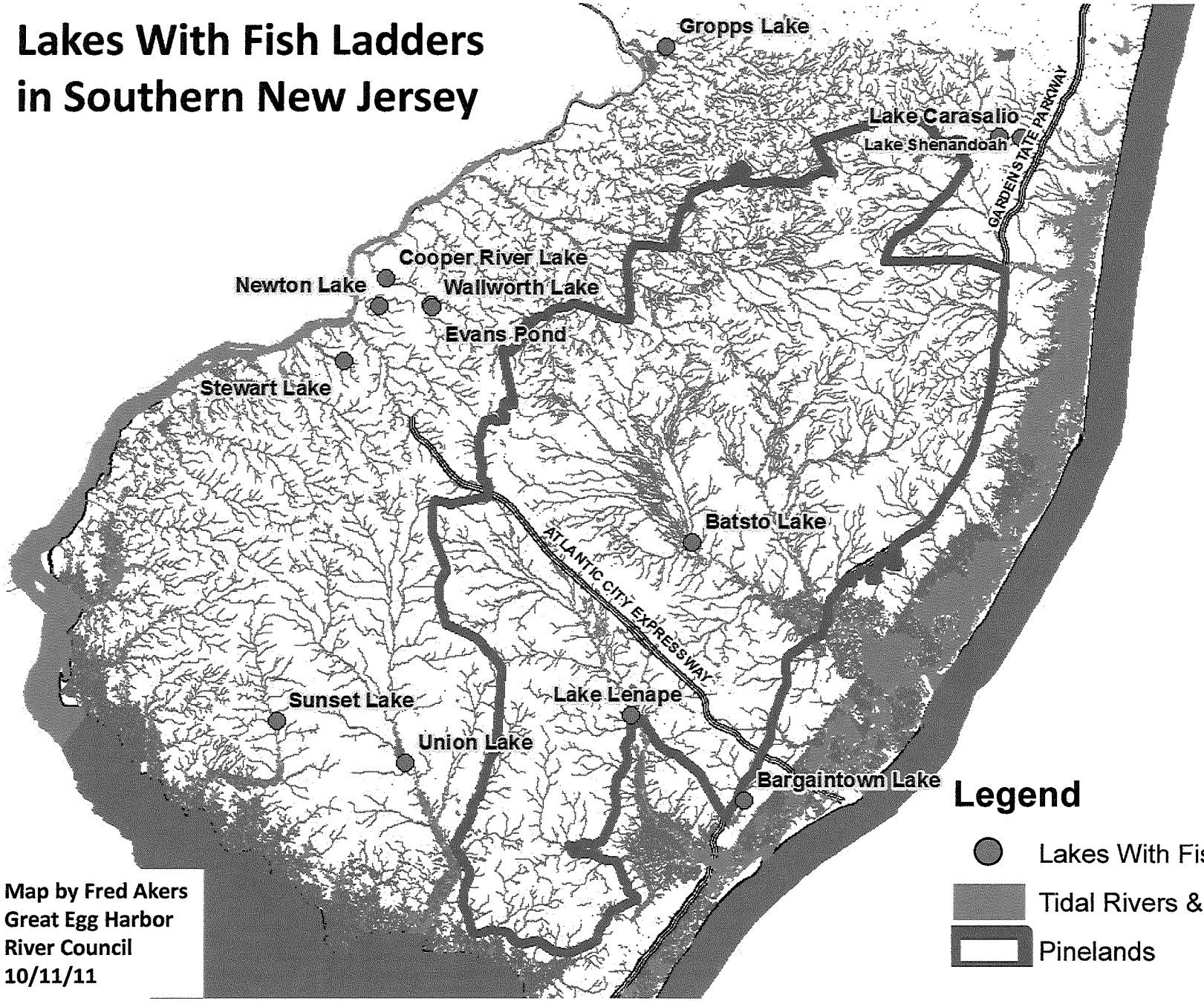
We thank you, the MAFMC, and the other states for initiating and supporting these actions to protect the River Herring, and we hope that New Jersey's opposition to protecting the river herring gets no traction in the end.

Very Best Regards,



Fred Akers

Lakes With Fish Ladders in Southern New Jersey



Map by Fred Akers
Great Egg Harbor
River Council
10/11/11

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

June 4, 2012

Dr. Christopher M. Moore
Executive Director
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901
Re: **Amendment 14** – email to: msbamendment14@noaa.gov / jdidden@mafmc.org

Dear Dr. Moore:

On behalf of the 150 employees of our family-owned business, Lund's Fisheries, Inc., and the independent fishermen who also supply fisheries products to our processing facility in Cape May, New Jersey, we thank you for the opportunity to comment on Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan (MSB FMP / A14). Our comments follow the order of issues and options outlined in the Executive Summary of the Draft Environmental Impact Statement; the Public Hearing Document (PHD).

2.1.1 Alternative Set 1: Additional Vessel Reporting Measures

We support alternatives 1c., which would institute weekly vessel trip reporting for all MSB permits, to facilitate quota monitoring and cross checking with other data sources; **1d72**, which would require 72 hour pre-trip notification to the National Marine Fisheries Service (NMFS/the Agency) to facilitate observer placement (as currently required in the Atlantic herring FMP) although a 48 hour requirement in the longfin squid fishery may be appropriate due to issues raised in the PHD; **1eMack** and **1eLong**, which would require VMS for limited access mackerel vessels and longfin squid/butterfish moratorium vessels; **1fMack** and **1fLong**, which would require daily VMS reporting of catch by limited access mackerel vessels and longfin squid moratorium vessels, to facilitate monitoring and cross checking with other data sources; and **1gMack** and **1gLong**, which would require 6 hour pre-landing notification via VMS and facilitate quota monitoring, enforcement, and/or portside monitoring.

2.1.2 Alternative Set 2: Additional Dealer Reporting Measures

We are opposed to alternative 2b, which would require federally permitted MSB dealers to obtain vessel representative confirmation of SAFIS transaction records for mackerel landings over 20,000 pounds, *Illex* landings over 10,000 pounds and longfin squid landings over 2,500 pounds. The purpose of this proposal is to catch errors at the first point of entry in the data system but places fishermen and dealers in a potentially adversarial, competitive regulatory posture that should be reserved for the Agency.

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 (hails) and actual weights vary, which they will certainly continue to do.

We support alternative 2d, which would require that federally permitted SMB dealers weigh all landings related to mackerel transactions of 20,000 pounds but we believe this alternative should reach all mackerel landings. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch. **Since we support all mackerel being weighed, we are opposed to alternative 4d, which would use a volume to weight conversion, and require vessel hold certification, for Tier 3 limited access-permitted vessels.**

We support alternative 2f, which would require that federally permitted SMB dealers weigh all landings related to longfin squid transactions over 2,500 pounds but we believe this alternative should reach all longfin squid landings. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch. **Since we support all longfin squid being weighed, we are opposed to alternative 4e, which would use a volume to weight conversion, and require vessel hold certification, for longfin squid moratorium-permitted vessels.**

We are opposed to alternative 2g, which would allow dealers to use volume to weight conversions if they cannot weigh landings. Although not an option in the PHD, we support daily dealer reporting.

2.1.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures

We support alternatives 3b and 3c, which would require Captains and crew to provide reasonable assistance to observers and provide observers notice when pumping/haul back occurs on vessels with mackerel limited access and/or longfin squid moratorium permits. Our Captains and crew are already providing this assistance to observers. It is our understanding that the relationship between Federal observers, whom have been on our vessels over the past few years, and our Captains is excellent and we have attempted to cooperate with every request made to us by the observer program throughout this period of time.

We support the intent of alternative 3d, which would place an observer on any vessel taking on fish wherever/whenever possible, on vessels with mackerel limited access and/or longfin squid moratorium permits, although we recognize that the assignment of an observer on each vessel in a pair trawl operation (primarily in the mackerel and herring fisheries) has been at the discretion of the Northeast Fisheries Observer Program (NEFOP) up to this point in time.

We support alternative 3e, requiring the use of a "Released Catch Affidavit" if unobserved fish is released, or 'slipped' for any reason and understand that these are already being used. Our Captains make every effort so that observers can visually identify any fish in the net before they are released. We understand that NEFOP observers are satisfied with the cooperation they are already receiving from our Captains and crews.

We are opposed to alternatives 3f, 3g and 3j, which would require all fish to be discarded to be brought aboard for sampling by the observer. As we have repeatedly pointed out during the development of A14, and herring A5, 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 most, if not all, 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 in recording all fish caught.

We are strongly opposed to alternatives 3h, 3i, 3j, 3l, 3m, 3n, 3o and 3p (proposing trip termination after any slipped catch) as being simply punitive in nature and not constructive to the ongoing cooperation between our Captains, our crews and the observers on our vessels.

It is important, however, to retain in regulation, as has been done in the herring fishery, that fish can be released throughout the mackerel and longfin squid fisheries (although pumping does not normally occur in the longfin squid 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.

2.1.4 Alternative Set 4: Port-Side and Other Sampling/Monitoring Measures

We are opposed to alternatives 4b and 4c, which would require industry-funded 3rd party port-side landings sampling programs for mackerel and longfin squid vessels. To the extent possible, A14 and herring A5 should be consistent in their requirements concerning the mackerel, longfin squid and herring fisheries' efforts to reduce catches of river herring and shad, principally because many of these vessels (primarily those in the mackerel fishery) operate in both fisheries, depending upon the seasonal availability of the fishery resources that are the target of these directed fisheries. There is no similar proposal to establish an industry-funded port-side monitoring program in A5 so we cannot support these requirements in A14.

At the same time, we recognize that 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 mackerel and longfin squid fisheries are not considered overfished, nor is overfishing occurring, so maintaining OY in these fisheries must be a Council priority.

We agree with A14's Purpose A, to implement effective RH/S catch monitoring, 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, and herring A5, have 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 both Councils in these amendments 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 fish for herring, mackerel and longfin squid.

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 highly effective by the NEFMC, who has management authority over these species.

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 and shad 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 alternative 4f, a two-phase bycatch avoidance approach based on the SFC/SMAST/DMF project, as the only option that will best work to reduce the incidental catch of river herring in the herring, mackerel and longfin squid fisheries and allow for the continued production of optimum yield from the Atlantic herring, mackerel and longfin squid fishery resources.

2.1.5 Alternative Set 5: At-Sea Observer Coverage Requirements

Throughout the development of MSB A14, and herring A5, we have argued that the mackerel, squid and herring fisheries should not be singled out as being required to pay for excessive levels of observer coverage, beyond what the Agency and Councils may prioritize through an SBRM process; a treatment similar to other fisheries managed by the Councils.

We have taken this position because we believe that these pelagic fisheries are 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 MEDMR/MADMF shoreside monitoring program, a program that we believe should be expanded in the region, although, as we mention above, since both Councils are not on the same page with a requirement to establish a shoreside monitoring program, and since the ongoing SMAST project includes a shoreside monitoring component, we believe it is premature for A14 to require the establishment of an industry-funded shoreside monitoring program at this time.

We have heard herring FMAT and 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 target 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. We understand this target level of coverage is also used widely in the North Pacific.

Even so, we and the majority of other Category A-permitted herring vessels owners informed the NEFMC that we 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. **Similarly, we endorse this goal for the mackerel fishery but do not support an industry-funded observer program in the longfin squid fishery, where many day boats take just a few thousand pounds of squid per day and are in no position to pay for observers from the modest revenue realized from these trips.**

We take this position with a couple of caveats, however. First, we do not support maintaining 100% observer coverage levels in the herring fishery, or the mackerel fishery forever since we do not believe this coverage rate is necessary and because the expense can be significant. We suggested to the NEFMC 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 whether or not a 30% or similar level of coverage is necessary to adequately monitor the herring fishery in the future. **Similarly, we support the A14 alternative 5h, which would require reevaluation of an expanded coverage requirement after 2 years to determine if incidental catch rates justify the continued expense of continued high coverage rates.**

Second, we are only willing to purchase observer coverage in the mackerel and herring fisheries, 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 pelagic fisheries during the development of both A5 and A14 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 these fisheries.**

Recently, at the ASMFC May meeting, their *Atlantic Herring NEFMC Amendment 5 Working Group* made the following recommendation, concerning expanded observer coverage, which we endorse, for both A5 and A14: **"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."**

It may also be appropriate, as was recommended during the A5 public hearing process, that those vessels with consistently higher bycatch rates, or more numerous encounters, be required to carry a higher level of observer coverage than other vessels during this phase-in period and in the future.

Third, we only support a temporary, 100% observer program if it 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.

A waiver program like this is described at page 160 of the A14 DEIS (although there is no specific alternative to select, as there was in A5). This is a critical element of any program that would expand observer coverage, and require industry funding for even an interim period of time, in the herring and mackerel or fisheries.

2.1.6 Alternative Set 6: Mortality Caps

We support alternative 6a, the no-action alternative. We do not support the Council considering a historical catch-based or a biologically-based cap, through either a framework adjustment process or the specifications process with this amendment. It is our understanding that neither the FMAT nor the herring PDT have recommended the establishment of a cap because there is insufficient information upon which to base one.

The relative mortality effects of incidental catches in the mackerel, longfin squid and herring fisheries are unknown and would be critically important to understand before attempting to set a biologically-based cap and risk the industry's ability to fish successfully for mackerel, longfin squid or herring. We do not agree with the statement made in the PHD, at page 12, which infers that reducing the incidental catch of river herrings or shad in the mackerel or longfin squid fishery may be "likely to restore RH/S populations." This seems highly unlikely with 95% of the species' freshwater habitat already altered or eliminated.

As we know, the ASMFC has recently released an updated stock assessment for river herring and a peer review of the assessment. Two statements in the peer review report support our belief that the incidental catch of river herring in the mackerel, longfin squid and herring fisheries does not threaten these populations but that other factors far outweigh incidental fishing mortality. These are:

"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 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 the south." and; "The coastwide meta-complex of river herring is depleted to near historic lows...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."

What is the relative mortality effect of incidental catches of river herrings and shads? Is it significant enough to risk our ability to harvest millions of dollars of fisheries resources, which are being managed sustainably today?

What is the relative mortality effect of current incidental catches of river herring in the ocean, as compared, for example, with the mortality effect of the directed river herring fisheries, which the ASMFC has determined to be 'sustainable'? Would eliminating the Atlantic mackerel, longfin squid and Atlantic herring fisheries completely, for example, restore RH/S species?

During this debate, which has taken place over a period of years, we have not seen any data that suggests that this would be the case and therefore we do not support a river herring or shad catch cap being imposed in these fisheries, with the potential for them to be shut down without realizing the public benefits of achieving optimum yield from these important fisheries.

We have identified our support for the continuation of the SMAST bycatch avoidance project, which we believe has already had the effect of minimizing the incidental catch or river herring and shad, as required by National Standard 9. We believe this approach to be adequate given what we believe to be our minor effect on the coastwide blueback herring, alewife and shad resources, none of which are targeted by our commercial fishing fleets.

2.1.7 Alternative Set 7 – Restrictions in areas of high RH/S catch
We support alternative 7a, the no-action alternative.

We have previously identified our support for increased observer coverage in the mackerel fishery, and have agreed to fund additional coverage, on an interim basis, which will help to identify the amount of river herring and shad that may be encountered, on a day-to-day basis during those times and in those areas where the fish may be found. We are opposed to area closures as they are not sensitive to which fish species may be found within them, on a real-time basis. In addition, the SMAST bycatch avoidance project will continue to work to direct the fleets away from where concentrations of river herring and shad may be found, also in real-time, so that we can meet the National Standard 9 requirement that, to the extent practicable, the incidental catch of and mortality of river herring and shad species be minimized.

2.1.8 Alternative Set 8 – Hotspot Restrictions
We support alternative 8a, the no-action alternative.

Our comments follow those concerning Alternative Set 7, above.

2.1.9 Alternative Set 9 – Addition of RH/S as "Stocks in the Fishery" in the MSB FMP

We support alternative 9a, the no-action alternative.

Under the no-action alternative, primary RH/S management would continue to rest with the states, as coordinated through the ASMFC, as stated at page 82 of the PHD.

The January 16, 2009 Final Rule amending the guidelines for National Standard 1 (NS1) provides guidance to the Councils concerning criteria necessary to establish target and non-target species as "stocks in the fishery" stating that ***"Stocks in the fishery" need status determination criteria, other reference points, ACL mechanisms and AMs."***

It is our opinion, after reviewing the recently published ASMFC stock assessment for river herring and the accompanying peer review report, there continues to be insufficient information upon which to establish a status determination for these species.

In discussing the population model used in the ASMFC assessment (page 19), the Peer Review panel stated, ***"In summary, the panel concurred with the SASC (Stock Assessment Subcommittee) that the DB-SRA (depletion-based stock reduction analysis) model did not adequately model river herring stock conditions and should not be used to assess status."***

Also, in response to TOR 6 of the assessment, *"Evaluate stock status determination from the assessment; if appropriate, recommend changes or specify alternative methods/measures"* (page 23), the Peer Review panel found, ***"Coast wide status of the stock (biomass and exploitation rates) in relation to management reference points could not be determined."***

Since the revised NS1 guidelines are clear that identifying "stock determination criteria" is a necessary condition for a Council to establish a species as a "stock in the fishery", it is therefore inappropriate for RH/S stocks to be designated as such in the SMB FMP. It is our view that the SMB FMP is sufficient to work to minimize bycatch and the mortality of the bycatch of RH/S stocks when they may be found in the ocean, through the management measures that we are supporting in our comments concerning the PHD.

The outcome of the NEFMC's consideration, and rejection, of RH/S species as "stocks in the Atlantic herring fishery" should be instructive for the MAFMC. In the March 2, 2011 Final Rule, implementing "approved measures" in A4 to the Atlantic herring FMP (FR Vol. 76, No.41), the NMFS makes the following statements concerning this issue: ***"While other species are caught incidentally when fishing for herring, herring is the target stock, and the only stock directly managed by the Herring FMP. This action established herring as a stock in the fishery...Bycatch in the herring fishery will continue to be addressed and minimized to the extent possible, consistent with other requirements of the MSA."***

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 mackerel and longfin squid fisheries, through the implementation of Amendment 14, to ensure a sustainable Atlantic mackerel and longfin squid resource and fishery for many years into the future.

With best regards,

Jeff Reichle

Jeffrey B. Reichle
President

38 of these letters were received from Lund's Employees

Thank you for the opportunity to comment on Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan. My comments follow the order of issues and options outlined in the Public Hearing Document (PHD):

Alternative Set 1: Additional Vessel Reporting Measures

We support weekly VTR reporting for MSB vessels and a 72 hour observer notification requirement for mackerel vessels. A 48 hour requirement may be appropriate for Loligo vessels. We support a daily VMS reporting requirement for limited access MSB vessels, and a 6 hour pre-landing notification requirement for these vessels.

Alternative Set 2: Additional Dealer Reporting Measures

We support a requirement that would have all MSB dealers weigh and sort all landings in the MSB fisheries. Although it is not an option in the PHD, we support daily dealer reporting.

Alternative Set 3: Additional At-Sea Observation Optimization Measures

We support the measures proposed to facilitate good cooperation between our Captains, crews and Federal observers, along with the use of a "Released Catch Affidavit" when unobserved fish may be released before the observer can see it. We understand these measures are already in place and working well. Requiring nets with fish in them to be hauled over the side on midwater trawlers is dangerous, however. Our Captains and crews are cooperating with observers so that any fish remaining in the net after pumping can be accounted for by observers while the net remains alongside the vessel.

Alternative Set 4: Port-Side and Other Sampling/Monitoring Measures

Since it is important to coordinate regulations affecting the Atlantic mackerel and Atlantic herring fisheries, we do not support the establishment of an industry-funded portside monitoring system at this time since it is not being proposed in Herring Amendment 5. We do support the continuation of the river herring and shad bycatch avoidance project, being facilitated by the Sustainable Fisheries Coalition (of which Lund's Fisheries is a member), SMAST and Mass. DMF, since it is more effective in reducing incidental catches of these fish, in 'real time', than area closures would be and since shoreside monitoring is a component of this project.

Alternative Set 5: At-Sea Observer Coverage Requirements

In response to proposals made in herring A5, we and the majority of companies operating midwater trawlers have agreed to a temporary 100% observer requirement, with industry funding up to $325 a day, and with a determination made in two years whether this expense is necessary to maintain. We support this approach in the mackerel fishery but do not support an industry-funded program in the Loligo fishery since it would be too costly for smaller vessels.

Alternative Set 6: Mortality Caps

We do not support the Council considering a historical catch-based or a biologically-based cap, through either a framework adjustment process or the specifications process, with this amendment. It is our understanding that neither the FMAT nor the herring PDT have recommended the establishment of a cap because there is insufficient information upon which to base one. How does ocean bycatch mortality compare to directed, in-river catches of RH/S, determined to be 'sustainable' by ASMFC?

Alternative Set 7 & 8 – Restrictions in areas of high RH/S catch / Hotspot restrictions

We are opposed to area and hotspot closures or restrictions as they are not sensitive to which fish species may be found within them, on a real-time basis. In addition, the SMAST bycatch avoidance project will continue to work to direct the fleets away from where concentrations of river herring and shad may be found, in real-time, so that we can meet the National Standard 9 requirement that, to the extent practicable, the incidental catch of and mortality of river herring and shad species should be minimized.

Alternative Set 9 – Addition of RH/S as "Stocks in the Fishery" in the MSB FMP

We support the no-action alternative; primary river herring and shad management would continue to rest with the states, as coordinated through the ASMFC. The revised NS1 guidelines are clear that identifying "stock determination criteria" is a necessary condition for a Council to establish a species as a "stock in the fishery". After reviewing the ASMFC stock assessment for river herring and the peer review report, there continues to be insufficient information to establish a status determination for these species, therefore it is inappropriate for river herring and shad stocks to be designated as such in the SMB FMP. The FMP is sufficient for the Council and industry to work together to minimize bycatch, and the mortality of bycatch of RH/S stocks when they may be found in the ocean, through the management measures that we are supporting in our comments concerning the amendment.

Signature / date Otero Omar 5-18-12

Name and address Omar Seda otero

Employer LUND'S FISHERIES

RIVER HERRING/SHAD ANALYSIS - CORNELL LONGFIN SQUID CONSERVATION GEAR TECHNOLOGY PROJECTS

PROJECT	TOTAL NUMBER OF TOWS	NUMBER OF TOWS THAT INCLUDED HERRING/ SHAD	HERRING/ SHAD TOTAL IN POUNDS	LONGFIN SQUID TOTAL IN POUNDS	TOTAL CATCH IN POUNDS (ALL SPECIES)	% OF TOTAL CATCH THAT WAS HERRING/ SHAD	INSHORE OR OFFSHORE
AGA - BELLY PANEL	90	16	21	11,399	115,932	0.02%	INSHORE
PROOF OF CONCEPT 12" DROP CHAIN	23	0	0	3,002	8,831	0.00%	INSHORE
DROP CHAIN II	96**	19	317	25,982	55,414	0.57%	INSHORE
DROP CHAIN II	48***	19	323	19,656	41,778	0.77%	OFFSHORE
BUTTERFISH BYCATCH BRD	256****	104	2,105	141,606	336,691	0.63%	OFFSHORE
TOTALS	**513**	**158**	**2,766**	**201,645**	**558,646**	**0.50%**	**N/A**

* INCLUDED IN THIS ANALYSIS WAS HICKORY SHAD, AMERICAN SHAD, AND A GENERAL CATEGORY HERRING THAT WAS UTILIZED ON THE DATA SHEETS FOR EACH OF THESE PROJECTS. FOR THE SAKE OF THIS ANALYSIS, ANYTHING THAT WAS LISTED UNDER GENERAL HERRING WAS INCLUDED IN THIS TABLE. BUT, IT IS POSSIBLE SOME SPECIES OF HERRING THAT MAY NOT BE CLASSIFIED AS RIVER HERRING (I.E. ATLANTIC HERRING) WERE ALSO REPORTED UNDER THE GENERAL HERRING CATEGORY ON THE DATA SHEETS.

** 48 PAIRED TOWS

*** 24 PAIRED TOWS

**** 128 PAIRED TOWS

OBSERVATIONS

- 30.8 % of all tows included herring/shad
- The amount of herring/shad captured in any single tow ranged from 0.3 lbs. to 274.2 lbs.
- 115 of the 158 tows that had herring/shad, had 10 lbs. or less total herring weight. This equates to 72.8 % of the tows that included herring/shad had 10 lbs. or less total weight of herring/shad.
- The squid total (201,645 lbs.) is 36.1 % of the total catch (558,646 lbs.) while the herring/shad total (2,766 lbs.) is only 0.50 % of the total catch.

Cornell University Cooperative Extension Marine Program, 423 Griffing Ave., Riverhead, NY 11901

24 Of these Postcards were received from NY, NJ, and PA

PROTECT and RESTORE RIVER HERRING and SHAD

Dear Executive Director Moore:

I am concerned about the declining river herring and shad stocks and the unrestricted catch of these forage species by the Atlantic mackerel and squid fisheries. Although most Atlantic states now prohibit the harvest and possession of river herring in state waters, the catch of river herring and shad continues without limit or regulation in ocean waters. I urge the Mid Atlantic Fishery Management Council to protect river herring and shad in federal water and promote their recovery by supporting:

1. **Immediate implementation of a river herring and shad catch cap;**
2. **100 percent at-sea monitoring of industrial trawlers, strong controls on at-sea dumping of un-sampled catch, and requirement to weigh all catch;**
3. **Inclusion of river herring and shad as non-target stocks in the fishery that are in need of conservation and management.**

Signed: Steve Raphael Print name: Steve Raphael

City: NY State: NY

Conserving Ocean Fish and Their Environment
Since 1973

May 23, 2012

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 N. State St
Dover, DE 19901

Re: AMENDMENT 14

Dear Dr. Moore,

The National Coalition for Marine Conservation (NCMC) appreciates the Mid-Atlantic Council's commitment to aid in the recovery of river herring and shad populations by addressing inadequate catch monitoring, unregulated incidental catch and the inability of the current management framework to conserve these wide-ranging stocks. The impacts associated with depleted[1] shad and river herring stocks are far-reaching. As anadromous forage species, shad and river herring are prey to numerous predators both inland and offshore, and through these predator-prey interactions, shad and river herring are linked to a number of recreational and commercial fisheries on the east coast, including those managed by the Mid-Atlantic Council.

Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP) includes a diverse suite of measures for developing badly needed conservation and management strategies in federal waters. We respectfully submit the following comments to assist the Council in determining the best path forward.

We believe the best path forward must be a two-phase process that begins with an interim strategy, coordinated with the New England Council, to improve catch monitoring and reduce incidental catch. While necessary in the short-term to help mitigate impacts to river herring and shad stocks, a fragmented management approach for federal waters, pieced together by two separate councils under two separate FMPs, will ultimately fall short - an unacceptable scenario given the critical status of these species. **Therefore, the second phase would be to fully incorporate shad and river herring into the MSB FMP through a subsequent amendment.** The inclusion of shad and river herring as stocks in the fishery is the only approach that would afford the Council adequate tools, resources and authority to successfully mitigate threats in federal waters for the long-term.

[1] 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.

ASMFC. May 2012. Stock Assessment Report No. 12-02 of the Atlantic States Marine Fisheries Commission: River Herring Benchmark Stock Assessment, Volume 1.

4 Royal Street, SE • Leesburg, VA 20175 • (703) 777-0037 • fax (703) 777-1107
www.savethefish.org

Phase 1: Interim Strategy, Consistent Where Applicable with the New England Council's Atlantic Herring FMP, to Improve Catch Monitoring and Reduce Incidental River Herring and Shad Catch. Below we outline interim strategy goals and alternatives that would be most effective in achieving these goals. Our comments follow the alternatives and are in *italics*.

- **Interim Goal 1: Improve the efficiency, timeliness and accuracy of vessel and dealer reporting so as to improve the precision of river herring and shad incidental catch estimates which are extrapolations based on total reported landings. Improvements should be standardized throughout the mackerel, squid and butterfish fisheries and consistent with reporting requirements in the Atlantic Herring FMP because of fishery overlap.**

  Vessel Reporting (Alternative Set 1)

  - **1c:** Weekly vessel trip reporting (VTR) for all MSB permits (mackerel, longfin squid/butterfish, Illex) so as to facilitate quota monitoring (directed landings and/or incidental mortality cap if applicable) and cross checking with other data sources.
  - **1d48:** Require 48 hour pre-trip notification to NMFS to retain/possess/transfer more than 20,000 pounds of mackerel so as to facilitate observer placement.
  - **1eMack & 1eLong:** Require VMS for limited access mackerel vessels and for longfin squid/butterfish moratorium vessels.

    A great majority of mackerel limited access and squid/butterfish moratorium permitted vessels are already equipped with VMS (A14 DEIS, pp. 292, 294).
  - **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.
  - **1gMack &1g Long:** Require 6 hour pre-landing notification via VMS to land more than 20,000 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)

  - **2b:** Require federally permitted MSB dealers to obtain vessel representative confirmation of SAFIS transaction records for mackerel landings over 20,000 lb, Illex landings over 10,000 lb, and longfin squid landings over 2,500 lb to catch data errors at first point of entry.
  - **2c, d, e & f::** Require that federally permitted SMB dealers weigh all landings related to mackerel transactions over 20,000 pounds and longfin squid transactions over 2,500 pounds.

    We view this suite of alternatives as working together to provide for efficiency and flexibility. 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.

- **Interim Goal 2: Employ increased 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)."**

  Observer Optimization Measures (Alternative Set 3)

  - **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.
  - **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.
  - **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.

    We recommend striking the words "wherever/whenever possible" from this alternative as it leaves too much ambiguity regarding the exceptions to this important requirement. *According to Appendix 5 of the DEIS (p. 662), the majority of Fish NK records are associated with fish that are pumped to the paired trawl vessel not carrying the observer. Between July 2009 and June 2010 over 5.7 million pounds of catch was recorded as Fish NK in the observer database.*[2]
  - **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 mid-water 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 clarify that operational discards must be brought aboard for sampling consistent with current CA1 sampling regulations.
  - **3l** *(implemented in conjunction with 3J)***:** 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.

    From 2006-2010, 26% of hauls on observed mackerel trips had some unobserved catch (A14 DEIS, p. 130) - a troublingly large percentage given the cost of observers and the need for accurate catch data. CA1 regulations in the Atlantic herring fishery have been highly effective with no observed slippage events recorded in 2010.[3]

[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] Amendment 14 DEIS, Appendix 5, p. 658.

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 3j, permitting 10 slippage events before slippage results in trip termination seems to be a reasonable balance that would deter slippage without being unduly penalizing.

- **3n** *(implemented in conjunction with 3J)***:** 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 minimize slippage events.

  On observed longfin squid trips, an average of 9% of hauls are not seen and sampled by observers (A14, p.130). As discussed above, an accountability measure is an important component to the CA1 sampling requirements to ensure compliance, and we believe an allowance of 10 slippage events per trimester before trip termination is implemented is appropriate for deterring slippage.

- **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 (3g, 3h, 3k-3n), then the relevant vessel would have to take an observer on its next trip.

  This alternative should be implemented if observer coverage levels are not set sufficiently high (e.g., >50% of trips within a permit tier such as mackerel Tier 3 or minor longfin squid/butterfish moratorium permitted vessels) as to discourage observer avoidance strategies.

<u>At-Sea Observer Coverage Requirements (Alternative Set 5)</u>

Note: We believe limited resources should be dedicated to an at-sea observer program, which obtains data for both kept and discarded catch. In contrast, portside sampling only captures information for the catch that is maintained, and therefore misses an important part of the equation. Without maximized retention, not considered in Amendment 14, we do not support portside sampling (Alternative Set 4) for deriving estimates on river herring and shad incidental catch.

- **5b4**: Require 100% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 20,000 pounds of mackerel unless they had notified their intent to retain more than 20,000 pounds of mackerel.

  Analyses in Amendment 14 estimate that mid-water trawl vessels account for 75.7% of river herring incidental catch and 41.8% of shad incidental catch (A14, Appendix 2, p. 581). Mid-water trawl vessels are also responsible for the majority of mackerel landings, accounting for 62% of landings in 2010 (Amendment 14, Table 29, p. 247). According to information presented in Amendment 11 to the MSB FMP, there are 15 mid-water trawl vessels that are eligible for the mackerel limited access program (13

in Tier 1 and 2 in Tier 2).[4] *Given the high volume nature of these vessels, and the fact that shad and river herring catch events can be rare but quite large when they occur, 100% coverage is necessary for an accurate accounting of incidental catch. In addition, mid-water 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 mid-water trawl fisheries for Atlantic herring and mackerel (see A14, Appendix 2, p. 574), observer coverage levels should be consistent between the FMPs.*

- **Modified 5c:** Require 100% of SMBT (<3.5 in) mackerel trips by Tier 1 and Tier 2 limited access mackerel vessels intending to retain over 20,000 pounds of mackerel to carry observers. Require 25% of SMBT trips by Tier 3 vessels intending to retain over 20,000 pounds of mackerel to carry observers.

  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 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.[5] *Neither Tier 1 nor Tier 2 vessels are capped by a percentage of the quota, and there are no trip limits for Tier 1 vessels. For Tier 3, however, 138 vessels qualify,*[6] *and this tier is capped at 7% 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*[7]*, likely making the observer costs significantly more burdensome for vessels in Tier 3 relative to their daily operating costs.*

- **Modified 5d:** Require 50% of SMBT (<3.5 in) longfin squid trips by major longfin squid moratorium permitted vessels intending to retain over 2,500 pounds of longfin squid to carry observers.

  Merely 3.5% of longfin squid catches by weight have been observed in recent years (2006-2010),[8] *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 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 significantly active in this fishery in the last 5 years, and these vessels account for around 95% of the annual landings.*[9] *Of these vessels, 57 major vessels account for 75% of landings.*

[4] MAFMC. Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP). May 2011, Tables 94-96, pp. 447-448.

[5] ibid

[6] ibid

[7] See note 4, Table 82, p. 435.

[8] Amendment 14 DEIS, p. 147.

[9] MAFMC. Loligo AP Informational Document, April 2012, Table 6.

- **5f:** Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers.

- **Interim Goal 3: Implement an effective strategy for reducing incidental catch of river herring and shad from recent levels.**

  Mortality Caps (Alternative Set 6)

  Note: Bycatch avoidance programs are only effective if there is incentive to avoid the bycatch. The Sustainable Fisheries Coalition Bycatch Avoidance Project (alternative 4F) is not an appropriate measure for the Council to consider for meeting the goal of reducing incidental river herring/shad catch. 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. The establishment of river herring/shad caps should be a prerequisite for Council support of industry bycatch avoidance tools.

  - **Combine and modify 6b and 6c:** Implement a mortality cap for alosines (shad and river herring species combined) for the mackerel fishery whereby the mackerel fishery would close once it is determined that it created a certain level of alosine mortality (that level would be determined annually by Council in specification process. As data improve, the Council could also determine through the specifications process if the cap should be further delineated by species). If the mackerel fishery closes because the cap is reached, the mackerel incidental catch allowance would be reduced to 2,000 lbs.

    A combined 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 for Mid-Atlantic fisheries, high CVs around species-specific incidental catch estimates may be problematic (A14 DEIS, Appendix 1, Table A2). Atlantic herring and Atlantic mackerel mid-water trawl fishery overlap complicates implementation of a cap on the mackerel fishery alone, since Atlantic herring fishing may continue in the same quarter and in the same areas allowing catch of river herring and shad to continue. The current mackerel incidental allowance of 20,000 lbs is far too liberal for deterring directed fishing and minimizing fishing effort should a cap be reached. In comparison, the 2,000 lbs incidental Atlantic herring limit, implemented after a herring management area closes, has proven effective. For example, when Atlantic herring Area 2 closed on February 20th of this year, mackerel fishing that takes place in the same area leveled off.[10]

  - **6f:** Add mortality caps to list of measures that can be frameworked.

    A cap in the mackerel fishery should be implemented with Amendment 14. The MSB FMP currently does not list incidental catch caps as frameworkable measures. As

[10] NERO. Weekly Quota and Landing Report. http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm

data improve, the Council may find that caps in the squid and butterfish fisheries are necessary and this alternative would facilitate implementation.

Hotspot Restrictions (Alternative Set 8)

- **8eMack:** Vessels possessing a federal mackerel permit would not be able to retain, possess or transfer more than an incidental level of fish (20,000 pounds mackerel) while in a River Herring Protection Area unless no mesh smaller than 5.5 inches is onboard the vessel.
- **8eLong:** Vessels possessing a federal moratorium longfin squid permit would not be able to retain, possess or transfer 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.
- **Modified 8f:** Make the above measures **8eMack and 8eLong** only effective if/when they are effective for Atlantic Herring vessels.

  We recognize that the Amendment 14 FMAT and the Atlantic Herring PDT had different approaches to hotspot analyses and therefore had differing results. We believe, based on the Amendment 5 analyses,[11] there would be a conservation benefit to both river herring and shad if the River Herring Protection Areas identified through Amendment 5 were implemented. Though they are driven by water temperature, like other small pelagic species, river herring and shad congregate where food is available. Static or slowly changing ocean features such as topography can significantly influence productivity which in turn influences the location of feeding grounds. If River Herring Protection Areas are implemented in the Atlantic herring fishery, then the conservation benefit would be greatly diminished if small-mesh gears capable of taking river herring were permitted in the closed areas simply because they are targeting a species other than Atlantic herring. ***We do not support the trigger-based river herring alternatives in Amendment 5 as triggers based on median, mean or highest catch would simply be a labor and resource intensive way of maintaining the status quo, and we have modified the above alternative accordingly.***

Federal FMPs must describe the species of fish involved in a fishery, and NMFS and the Councils are required to manage those stocks in need of conservation and management, such as river herring and shad.[12] While Amendment 14 is an important response to shad and river herring incidental catch, analyses in the Draft Environmental Impact Statement (DEIS) make it clear that addressing the problem within MSB fisheries is but one piece of a larger puzzle that needs to be assembled in order to adequately protect these fish throughout their life cycles and throughout all parts of their range, especially in ocean waters where they spend most of their lives. Fully incorporating river herring and shad into the MSB FMP (Phase 2) is the only comprehensive solution provided in Amendment 14 that would afford adequate, long-term conservation and management to these imperiled but ecologically critical species.

[11] See Draft Amendment 5 to the Fishery Management Plan for Atlantic Herring, Volume II, Appendices.

[12] 16 U.S.C. §§ 1853(a)(2); 1852(h)(1). *See* also *Flaherty v. Bryson*, 2012 WL 752323 (D.D.C. Mar. 9, 2012).

Phase 2: Addition of River Herring and Shad as "Stocks in the Fishery"in the MBS FMP (Alternative Set 9)

In our scoping comments submitted in 2010, we stated that "Amendment 14 will be most effective if the Mid-Atlantic Council tackles the issue with a regional, ecosystem perspective versus a narrow fishery-specific view." Analyses conducted for Amendment 14 correctly take a regional and fleet-based approach to investigating solutions for monitoring and reducing incidental catch. The mid-water trawl fishery for Atlantic herring and Atlantic mackerel - managed by two councils under two separate federal FMPs - accounts for 71% of combined river herring and shad incidental catch. Likewise, fleet overlap exists between New England and the Mid-Atlantic small-mesh bottom trawl fisheries, which are responsible for an estimated 24% of the combined incidental catch.[13]

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 (A14 DEIS, p. 111). The "spawn-at-least-once" principle suggests that sustainability is secured if fish become vulnerable to commercial gears only after they have spawned. Research shows that high fishing mortality on immature fish has a significant negative effect on stock status.[14] Indeed, the fact that immature fish comprise a large portion of at-sea catch was flagged as a concern by the Peer Review Panel in the recent river herring stock assessment.[15] The Peer Review Panel also found 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>[16]

Throughout the discussion of Amendment 14 alternatives, mention is made that the Council is limited to regulating only its own fisheries. But achieving precision in incidental catch estimates or a significant reduction in incidental catch depends on applying management measures consistently throughout the Northeast. Without region-wide and fleet-wide consistency of monitoring and management measures, the conservation burden will be placed on only a subset of fisheries that are contributing to the problem, and the overall conservation benefit to river herring and shad will be diminished.

We strongly support the suite of options in Alternative Set 9 (9b-e) that would launch an amendment process to incorporate blueback herring, alewife, American shad, and hickory shad as stocks-in-the-fishery under the MSB FMP. The amendment process is typically a two-year deliberative process, providing ample opportunity for the ASMFC, the Councils and stakeholders to work collaboratively on a joint management framework that is appropriate for the geographic range and life cycle of these fish.

The Magnuson-Stevens Act (MSA) requires Councils to specify annual catch limits (ACLs) at a level such that overfishing does not occur <u>in the fishery</u>, accompanied by accountability measures to ensure that the limit is not exceeded.[17] To comply with the MSA's unambiguous mandate to prevent overfishing, the revised National Standard 1 regulatory guidelines [18]

[13] Amendment 14 DEIS, Appendix 2, Table 3, p. 581.

[14] 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.

[15] 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.

[16] Ibid, p.29

[17] 16 U.S.C. § 1853(a)(15)

[18] 50 CFR § 600.310

require ACLs for all managed stocks in the fishery, which may include non-target stocks caught incidentally as bycatch and either retained or discarded at sea. [19] The intent is to ensure that fishing mortality in federally managed fisheries is regulated and minimized as required under the U.S. fisheries law, supporting the states' efforts to conserve and build shad and river herring populations.

With stocks in a fishery designation, incidental catch limits for directed fisheries would be based on the best available science about what catch level is sustainable and in line with restoration goals, enhancing rather than compromising ASMFC's authority to manage and conserve these important fish. Among the benefits of a federal component to the interstate plan are requirements for river herring and shad to be prioritized in the annual observer and data collection programs, additional resources for stock assessment, annual reviews of data for fishery specifications, and broadening of the tools available to the Council to address catch in other federal fisheries that interact with river herring (See table below).

ISSUE	Problem	Benefit of Federal Stock Designation
COUNCIL AUTHORITY LIMITED TO ITS MANAGED FISHERIES	Actions the Mid-Atlantic Council can take to manage river herring and shad incidental catch are limited to its own fisheries, likely resulting in a disproportionate distribution of the conservation burden and/or ineffective management measures.	The tools available to the Council to manage and conserve river herring and shad would expand beyond its managed fisheries, allowing for conservation and management to be applied consistently throughout federally-managed fisheries that contribute to the problem.
MINIMIZING INCIDENTAL CATCH	The Magnuson Act narrowly defines bycatch as discards. Because most river herring and shad caught in federal fisheries are retained for sale, regulatory authority to reduce bycatch under National Standard 9 does not afford these species adequate protection.	Federal stock designation would require that all catch is accounted for and maintained at sustainable levels.
EFH IMPACT CONSULTATION	Federal councils cannot designate essential fish habitat (EFH) for river herring or shad unless they are included in a federal FMP.	EFH designation would ensure federal agency consultation with NOAA on projects that could impact these important river herring and shad habitats.
STOCK ASSESSMENT RESOURCES	State resources for stock assessment are extremely limited resulting in infrequent stock assessments. Stock assessments that are decades old are not useful for management purposes.	NMFS could allocate resources to aid with the stock assessment, including participation of the Northeast Fisheries Science Center. Assessment needs would likely dictate that river herring and shad be given higher priority in NMFS data collection programs (e.g., recording lengths and weights from trawl surveys, collecting otoliths for aging, genetic studies).
FEDERAL CATCH REPORTING	There is no standard methodology for documenting catch of river herring and shad in federal waters.	Catch reporting methodology to account for mortality on an annual basis would be implemented.
INCORPORATING NEW INFORMATION	There is currently no framework for regularly incorporating new information about river herring and shad populations and fisheries into federal management actions.	The status of river herring and shad fisheries and stocks would be reviewed annually in conjunction with catch specifications for mackerel, squid, and butterfish. All significant sources of mortality would be identified and accounted for.

[19] 50 CFR § 600.310(d)(3) & (4).

The ASMFC plan 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.

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.[20] Through a 2-phase strategy culminating in a federal management framework for river herring and shads, the Mid-Atlantic Council has a great opportunity to lead river herring and shad management in federal waters and take an active role in recovering these fish, which are invaluable to Atlantic fisheries and ecosystems.

Sincerely,

Pam Lyons Gromen
Executive Director

[20]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.

George
5/22cc: Pete C.
Aja
Carrie
Lindsey

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

Appendix 9 - **Comments received on the DEIS before the June 2012 Council Meeting but after the June 2012 Council Briefing Book was created (includes links to several large documents that were submitted as supporting materials).**

Amendment 14 Comment Supplement

Updated 6/11/12

Several large documents have been posted to or linked from: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm. They include (a reference hardcopy will be available at the meeting):

-C.Hall's Thesis: Damming of Maine Watersheds and the Consequences for Coastal Ecosystems with a Focus on the Anadromous River Herring (Alosa pseudoharengus and Alosa aestivalis): A Four Century Analysis.

-Two lists of petitioners from PEW totaling 37,785 individuals including any personal comments they added to a core letter. These individuals resided mostly in the United States and represented most if not all U.S. States.

-ASMFC River Herring Advisory Report PLUS ASMFC American Shad Advisory Report

-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/shadRiverHerring.htm

-River Herring Benchmark Assessment: Volume I (May 2012) (includes Terms of Reference & Advisory Report, Technical Committee Response to Peer Review Report, and Coastwide Assessment); Volume II (May 2012) (includes State/Jurisdiction-specific Stock Status Summaries); and River Herring Stock Assessment Overview (May 2012), all available at: http://www.asmfc.org/shadRiverHerring.htm

Updates on numbers of similar comments received have also been received:

- The letter on page 6 of the Council Briefing Book (Am5 & Am14) was received from 940 total individuals

- The letter on page 8 of the Council Briefing Book (Am14) was received from 6,645 total individuals

- The letter on page 10 of the Council Briefing Book (New York) was received from 531 total individuals

- The letter on page 12 of the Council Briefing Book (Stock in the Fishery) was received from 279 total individuals

- The letter on page 32 of the Council Briefing Book (Lunds) was received from 65 total individuals

- The Postcard on page 34 of the Council Briefing Book was received from 574 total individuals

The comments in this document were received after the Council Briefing Book mail-out. An Index Follows:

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

June 4, 2012

Christopher Moore, Ph.D
Executive Director
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, Delaware 19901

Dear Dr. Moore,

I am writing on behalf of the Atlantic States Marine Fisheries Commission to comment on Draft Amendment 14 to the Fishery Management Plan for Squid, Mackerel, and Butterfish (Amendment 14). The ASMFC Shad & River Herring Management Board (Board) has been following the development of Amendment 14 and appreciates the work of the Council in developing options to monitor and reduce shad and river herring bycatch in federal waters. The Board submits the attached comments on Amendment 14 for your consideration.

Thank you for the opportunity to comment. We look forward to continuing to work with you on this important issue.

Sincerely,

Robert Beal
Director
Interstate Fisheries Management Program

CC: Shad & River Herring Management Board

ATLANTIC STATES MARINE FISHERIES COMMISSION COMMENTS ON MAFMC DRAFT AMENDMENT 14 TO THE MACKEREL, SQUID, AND BUTTERFISH FMP

The Commission recommends that the both the New England and Mid-Atlantic Councils should strive for the highest level of consistency possible in approving the final management measures in Amendment 14 and the NEFMC's Amendment 5 to the Atlantic Herring Fishery Management Plan. Where consistency is not possible, the Councils should select measures that will provide the least amount of discord. The Councils should implement all practicable actions for reducing alosine bycatch.

Alternative Set 1– Additional Vessel Reporting Measures
The Commission is supportive of any measures that will improve accuracy and accounting of catch reporting for all species, including river herring. The Commission recommends consistency on VMS reporting and pre-trip notification requirements with the NEFMC (Options 1d-f).

Alternative Set 2 – Additional Dealer Reporting Measures
The Commission is supportive of any measures that will improve accuracy of landings reports for all species, including river herring. The Commission acknowledges that the requirement to weigh all fish would create an incremental burden as the fishery scales up, but that this would provide information which would be very beneficial to management.

Alternative Set 3 – Additional At-Sea Observation Optimization Measures
The Commission supports all of the measures to improve sampling by observers (Options 3b-d). The Commission also supports any measures that would discourage net slippage.

Alternative Set 4 – Port-side and Other Sampling/Monitoring Measures
The Commission recognizes in the value of portside programs, either conducted federally or through the states. There is unanimous support for the SMAST/MA DMF/ SFC bycatch avoidance program (Option 4f). The Commission believes that the implementation of a mortality cap in conjunction with this program could provide the most effective way to produce tangible results, but recognizes that the data to establish a biologically-based cap are lacking at this time.

Alternative Set 5 – At-Sea Observer Coverage Requirements
The Commission recommends implementation of observer coverage at the highest level possible to provide the most beneficial data for management. The Commission recommends observer coverage funding through Federal resources, but that phased-in, cost sharing alternatives are considered (Option 5g). Additionally the Commission recommends the differences in observer costs between the east and west coasts be examined.

Alternative Set 6 – Mortality Caps
The Commission does not support any measures which would increase mortality on alosines and recommends reducing the current level of morality that is occurring on these species. This is in line with recommendations from the American shad and river herring stock assessments. Ideally, if a mortality cap is implemented it should be based on a peer reviewed biological estimate of

coastwide American shad and river herring populations. The Commission encourages both Councils to pursue future development of mortality caps as information becomes available.

Alternative Set 7 – Restrictions in areas of high RH/S catch
The Commission expressed concern over the size of the proposed Management Areas, and that closures of these areas would essentially shut down the fishery. However, the Commission recognizes that larger management areas might provide a level of protection that could not be achieved through the use of smaller management areas.

Alternative Set 8 – Hotspot Restrictions
The Commission recommends consistency between the two Councils. If the NEFMC goes forward with the river herring monitoring/avoidance measures then the MAFMC should enact the same measures. The Commission recommends Options 8c and 8d when fishing in the River Herring Monitoring/Avoidance Areas, but that phased-in, cost sharing alternatives for observers should be considered. The Commission does not recommend the use of triggers a management tool without a method to link the trigger to a peer reviewed biological estimate of coastwide American shad and river herring populations. However, if the MAFMC or NEFMC approves the use of closures in the areas/times that are identified as River Herring Protection Areas, then these closures should be implemented through a trigger system rather than occurring automatically. The Commission notes that the information used in the development of the proposed triggers may only sustain the current level of river herring bycatch, rather than reduce bycatch.

Alternative Set 9 –"Stocks in the Fishery" Designation
Due to the complexity and uncertainty of a stock in the fishery designation for shad and/or river herring, consensus could not be reached on a preferred alternative. Board members made strong comments in support of and in opposition to such a designation. If the stock in the fishery alternative is approved and an amendment is initiated to consider implementation, then the Commission requests the chance to work cooperatively with the Council as the process moves forward.

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]

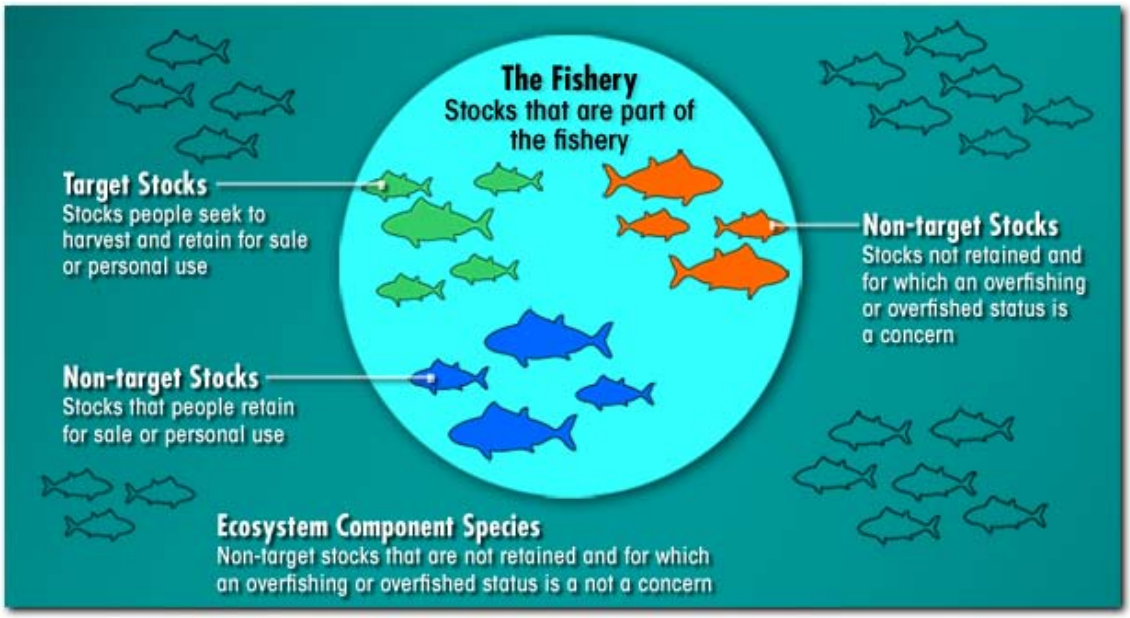
However, since Alternative Set 9b-e states that fully integrating river herring and shads to the MSB FMP as stocks in the fishery will require a further amendment, the Council must also use additional alternatives within Amendment 14 as interim measures to reduce and limit the unregulated incidental 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 Measures (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

June 4, 2012

Captain 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 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).**

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

[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

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 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

[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
[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

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 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

[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

[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

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.

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 small yet powerful 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)

[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.

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 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.

[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.

- **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.

  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.

[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.

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.

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

[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)

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 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

[30] See Am 5 DEIS at page 370
[31] See Am 5 DEIS at page 381
[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

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 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

[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

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 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.

<u>We oppose Sub-Options 2D (Requirements for Trips with Multiple Vessels) and 2F (Visual Access to the Net/Codend).</u>

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

[41] See Am 5 DEIS at page 433

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 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

[42] See Am 5 DEIS at page 418

[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*)

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 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 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 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 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.

[45] *See* 74 Fed. Reg. 68577 (Dec. 28, 2009).
[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.

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 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 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

[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).

[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.")

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 *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.

[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).

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 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

[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 I – Coastwide (May 2012) ("Stock Assessment Report").
[59] Stock Assessment Report - Executive Summary.
[60] Stock Assessment Report - Executive Summary.
[61] Stock Assessment Report - Executive Summary.
[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.

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 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

[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.
[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

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 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

[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
[78] See NEFMC Research Steering Committee Research Review Policy at http://www.nefmc.org/research/RSC%20ResearchReviewPolicy%20(2).pdf

(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.

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.

[79] See New England Fishery Management Council Herring Committee and Advisory Panel memo, July 22, 2008, regarding "Background Information re. Herring/Mackerel Fishery Interactions"

Sincerely,

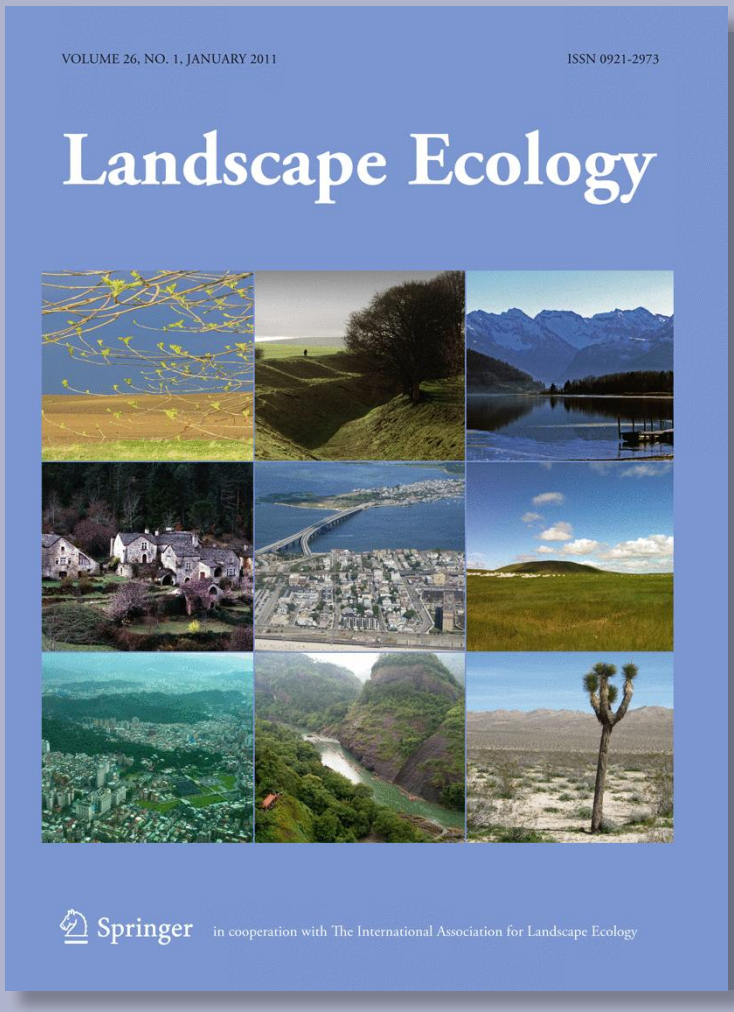
Peter Baker, Director
Northeast Fisheries Program
Pew Environment Group

The historic influence of dams on diadromous fish habitat with a focus on river herring and hydrologic longitudinal connectivity

Landscape Ecology

ISSN 0921-2973
Volume 26
Number 1

Landscape Ecol (2010)
26:95-107
DOI 10.1007/
s10980-010-9539-1



Springer

Landscape Ecol (2011) 26:95–107
DOI 10.1007/s10980-010-9539-1

RESEARCH ARTICLE

The historic influence of dams on diadromous fish habitat with a focus on river herring and hydrologic longitudinal connectivity

Carolyn J. Hall · Adrian Jordaan · Michael G. Frisk

Received: 23 February 2010 / Accepted: 1 October 2010 / Published online: 4 November 2010

Abstract The erection of dams alters habitat and longitudinal stream connectivity for migratory diadromous and potamodromous fish species and interrupts much of organismal exchange between freshwater and marine ecosystems. In the US, this disruption began with colonial settlement in the seventeenth century but little quantitative assessment of historical impact on accessible habitat and population size has been conducted. We used published surveys, GIS layers and historical documents to create a database of 1356 dams, which was then analyzed to determine the historical timeline of construction, use and resultant fragmentation of watersheds in Maine, US. Historical information on the anadromous river herring was used to determine natural upstream boundaries to migration and establish total potential alewife spawning habitat in nine watersheds with historic populations. Dams in Maine were constructed beginning in 1634 and by 1850 had reduced accessible lake area to less than 5% of the virgin 892 km^2 habitat and 20% of virgin stream habitat. There is a near total loss of accessible habitat by 1860 that followed a west-east pattern of European migration and settlement. Understanding historic trends allows current restoration targets to be assessed and prioritized within an ecosystem-based perspective and may inform expectations for future management of oceanic and freshwater living resources.

Keywords Historical Ecology · Gulf of Maine · Habitat fragmentation · Alewife · Blueback herring · Forage fish · Ecosystem · Energy flux · Restoration targets

Introduction

Widespread species loss and large-scale environmental change over the past 400 years has been well documented (Foster et al. 2002; Lotze et al. 2006; Jackson 2008). One prominent environmental change has been the fracturing of coastal watersheds by man-made obstructions (Dynesius and Nilsson 1994; Humphries and Winemiller 2009). Damming of waterways alters the aquatic environment and surrounding landscape through sedimentation, channelization, flooding and temperature changes (Poff et al. 1997; Poff and Hart 2002; Walter and Merritts 2008). Passage of aquatic migratory species between feeding and spawning sites is interrupted, as is the exchange of nutrients among ecosystems (Kline et al. 1990; Bilby et al. 1996; Walters et al. 2009). Subsequent habitat and population loss leads to alteration of foodwebs, loss of biodiversity, species decline and extirpation

Electronic supplementary material The online version of this article (doi:10.1007/s10980-010-9539-1) contains supplementary material, which is available to authorized users.

C. J. Hall (✉) · A. Jordaan · M. G. Frisk
School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY 11794-5000, USA
e-mail: cjhall29@me.com; info@gomher.org

(Pringle et al. 2000; Jackson et al. 2001; Pess et al. 2008; Morita et al. 2009). An understanding of the historical condition of ecosystems before significant anthropogenic impact is required to assess restoration targets, yet landscape studies and ecological baselines are often lacking historical perspective or use incomplete data (Wu et al. 2003). Historical data is needed to empirically evaluate the loss of habitat connectivity in relation to species presence and ecosystem function over centuries to effectively apply conservation and restoration methods (Haila 2002).

In the northeastern U.S., concentrated commercial fishing, forestry, agriculture and damming of riverways began altering the condition of river ecosystems with the arrival of European colonists in the seventeenth century. Unfortunately, reliable records of watershed conditions and fish harvests were not kept until the formation of Federal and State Fish Commissions in the 1860s (Atkins and Foster 1868; Judd 1997). Previous to these records were numerous mentions of colonial mill dams obstructing the migration of spawning fishes including river herring [collectively alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*)], shad (*Alosa sapidissima*), Atlantic salmon (*Salmo salar*) and Atlantic sturgeon (*Acipenser oxyrinchus*) (Anonymous 3/26/1798; Moody 1933, pp 445–446). After the construction of the first saw mill dam in Maine in 1634 (Pope 1965, p. 219), hundreds of small dams appeared statewide wherever natural waterfalls and topography provided an area of impoundment and the vertical height required to generate mechanical energy (Moody 1933, p. 332; Clark 1970, p. 336). In 1829 it was estimated that 1,686 principal manufacturing establishments, primarily mills, depended upon water-power (Greenleaf 1829, p. 451). Forty years later, over 3,100 sites in use or potentially suitable for harnessing water-power were documented in Maine (Wells 1869).

The species listed above are diadromous, crossing the ocean-freshwater boundary to complete spawning, and provided abundant resources to historical local diets and commercial fisheries along the Gulf of Maine's coastal and inland ecosystems (Atkins and Foster 1868; Mullen et al. 1986). They also provided a rich forage base for valuable coastal predators and game fish including Atlantic cod (*Gadus morhua*) (Baird 1872; Graham et al. 2002). Decline of coastal cod populations has been linked to the loss of the nutritious and predictable food source these species provided (Baird 1883; Ames 2004). By 1870, State Fish Commissioners concluded that dam construction was the principal cause of migratory fish extinction from Maine's waterways (Atkins and Foster 1868) and 20 years later estimated that only 10% of original habitat remained available for spawning (Atkins 1887). Current diadromous species' populations are at historic lows with some at less than 1% of early nineteenth century estimations (Lotze and Milewski 2004; Saunders et al. 2006). Presently, river herring and Atlantic sturgeon are listed as species of concern and Atlantic salmon as an endangered species (Federal Register 2006). Thus, efforts to provide long-term solutions through population and watershed restoration are of immediate importance, yet no comprehensive attempts have been made to assess virgin habitat baselines or thoroughly document the long-term scale of habitat destruction these species have endured.

Historical records of dam construction can present a timeline of stream and landscape alteration and physical impediment of spawning diadromous species. Here we estimate the loss of accessible freshwater habitat within Maine from 1600 to 1900 due to dam obstruction. First, we present a spatial and temporal analysis of dam construction from the seventeenth through the nineteenth century. Second, we quantitatively present an analysis of accessible migratory and spawning area, both stream and lake habitat, impacted by the erection of dams over time with river herring as our example "species." Current river herring habitat status and coastal watersheds will be evaluated in light of the historical baseline determined for the state of Maine and related to restoration of stream networks and ecosystem connectivity.

Materials and methods

River herring life history

River herring are a mid-trophic level species that prey primarily on zooplankton (Bigelow and Schroeder 1953). River herring reach reproductive maturity in 3–5 years and are iteroparous, or capable of spawning for multiple years, returning to spawn in natal Maine streams between late April and early July (MDMR 1982). Alewives historically migrated over 300 km to spawning areas in quiet freshwaters of Maine, primarily lakes and ponds but also slow sections of streams;

bluebacks prefer riverine habitat up to or near head of tide with moving water. Both species will spawn below head of tide provided that appropriate habitat is available (Bigelow and Schroeder 1953; MDMR 1982). For the purpose of this study, measured stream habitat is defined broadly as accessible habitat for both species but is not included in measurable alewife spawning habitat which is limited to lakes and ponds, and thus an underestimate of total potential area.

Study area

Dams throughout Maine were documented, but analysis was limited to nine historical river herring watersheds, approximately 60% of our estimated historical range, that were divided amongst three categories: (1) primary river watersheds with extensive tributaries totaling a stream distance of 1000 km or greater; (2) secondary watersheds with few tributaries totaling less than 1000 km; (3) bay watersheds composed of multiple small rivers and coastal waterways (Fig. 1). Primary (category 1) watersheds are the Androscoggin, Kennebec and Penobscot Rivers. Secondary (category 2) watersheds are the Mousam, Sheepscot, St. George, Union and Dennys Rivers. The Casco Bay watershed with the Presumpscot River was used as the example for tertiary (category 3) watersheds. Watershed analysis

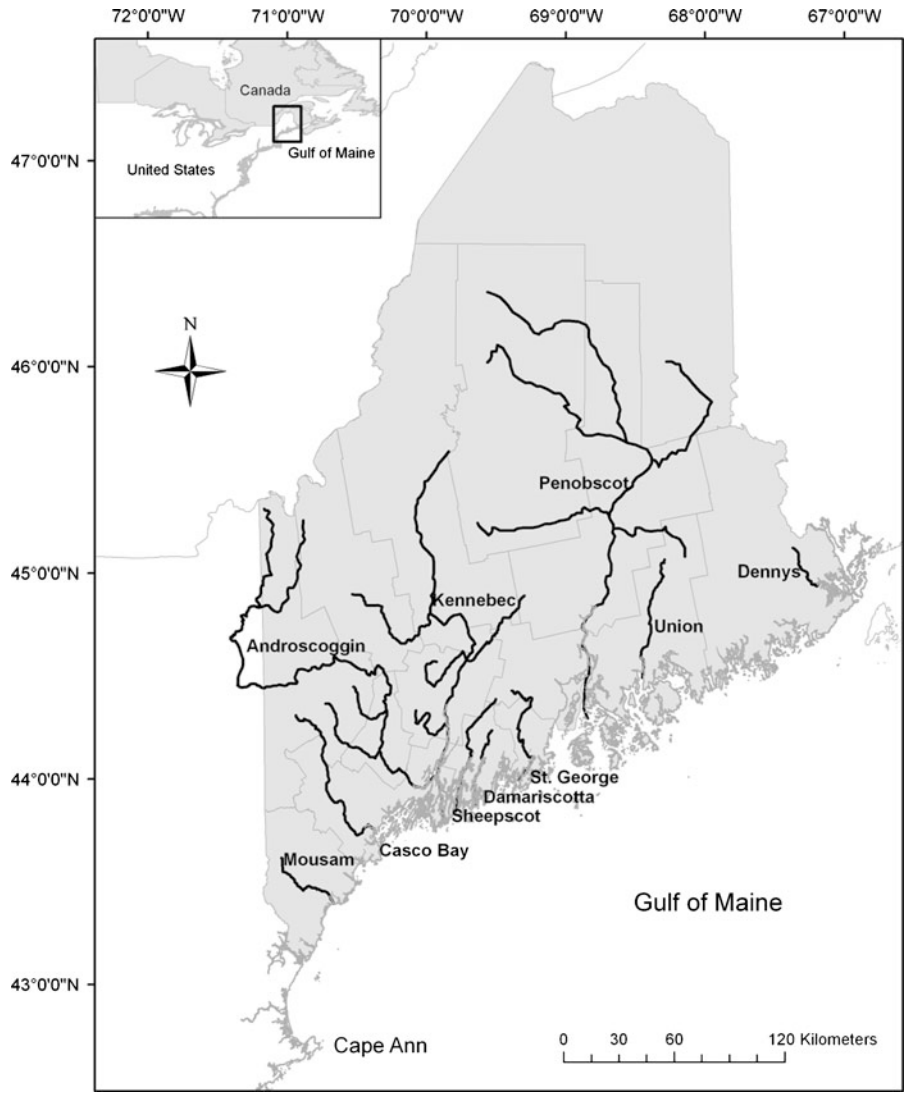


Fig. 1 State of Maine highlighted with historical river herring watersheds assessed in this study for temporal spawning habitat changes from 1600 to 1900

was constrained to within the State of Maine. The Damariscotta River watershed is also referenced in this study.

Methodology

We followed a 6-step procedure to document and map locations of dams, natural boundaries and upstream limits of diadromous fish migration, and determine the historical timeline of use and main stem blockage by dams.

1. Determination of current dam locations

The Maine Geographic Information Systems (MEGIS) Impound database completed in 2006 by the US Fish and Wildlife Service Gulf of Maine Coastal Program (MEGIS 2006) served as our initial database and includes full demographics of still functional dams including waterway, latitude and longitude, ownership, year of completion of the most recent dam at the location (not the original configuration), structural height, and limited information about recent breaches or removals. The database was developed from data collected in the U.S. Army Corp of Engineers (USACE) 1987 Dam Survey, Maine Department of Environmental Protection (MDEP), Bureau of Land and Water Quality (BLandWQ) staff for use with BLandWQ projects. The Maine Emergency Management Agency (MEMA) reviewed all point locations against existing orthophotography or digital raster graphic base layers. Point locations of dams, levees, and impoundments in Maine are at 1:24000 scale. Inventories of removed dams, potentially removable dams and currently active dams listed by MDEP (2009) were an additional source.

2. Determination of historic dams and timeline of use

The most comprehensive reference for historic dams was *The Water-power of Maine*, a hydrographic survey with water resource demographics from the 1860s (Wells 1869). Not all dams reported in Wells (1869) were included in this study. Omitted dams were: (1) not located due to an historic name or no precise location mentioned; (2) upstream of alewife migrations; (3) on tributaries above head of tide with no pond area for alewife spawning; or (4) one of many already surveyed dams on a short stretch of waterway (under 3 miles).

Nineteenth and twentieth century governmental reports were also used to identify and date original construction of dams. These included Maine Commissioner of Fisheries (COF) reports spanning from 1868 to 1899 (Atkins and Foster 1868, 1869; Atkins and Stillwell 1874; Atkins 1887; Smith 1899), and alewife fisheries reports and collections of Atlantic Sea-Run Salmon Commission river surveys and management reports through the 1980s (Rounsefell and Stringer 1945; Supplementary Materials I).

Dates and locations of dams constructed prior to Wells (1869) were found in wills, historical magazines and journals, town histories, eighteenth and early nineteenth century newspaper articles and records of early nineteenth century Maine Legislative Records containing legislative acts and petitions held at the Maine State Archives (Supplementary Materials I). Hand drawn maps labeled with early settlements included in historical publications gave clear references to location of mills and date of existence. For a full list of references used to date and locate mills and dams see Supplementary Materials I. In historical literature, mills are documented more consistently than dams, therefore it was assumed the presence of a mill indicated the presence of a dam.

3. Determination of main stem blockage

Main stem blockage, particularly dams at head of tide, was determined from historical reports by Atkins (1887) and other publications that stated the year of full obstruction and were only considered migration obstacles beginning on sourced dates.

4. Determination of natural barriers and limits to upstream alewife migration

Natural barriers and limits of anadromous species upstream passage, particularly alewives, were determined using Maine COF reports, alewife fishery and Atlantic Sea-Run Salmon Commission river survey and management reports (Atkins and Foster 1868, 1869; Atkins and Stillwell 1874; Atkins 1887; Smith 1899; Rounsefell and Stringer 1945; Supplementary Materials I). Because of historical omnipresence of alewives in Maine ponds with connection to the ocean (Atkins 1887; Mullen et al. 1986), all water bodies below natural barriers within known migration

distances were considered potential spawning sites. Thus, we assumed presence of fish unless we found evidence to the contrary. Town histories were instrumental in further determining presence or absence of alewives. For example, in *The History of Sanford Maine 1661–1900* (Emery 1901, pp. 169–170) litigation regarding fish passage for salmon, alewives and shad at mills within the town of Sanford on the Mousam River is discussed. This indicates alewives surmounted the considerable falls downstream of Sanford. Our approach possibly overestimates alewife lake and pond spawning habitat and requires further water body sediment and artifact research to empirically determine historical presence.

5. GIS mapping

All dams, natural obstructions and migratory limits were mapped using ESRI® ArcGIS™ v.9.3. Map base layers in 1:24000 scale of watersheds, counties and coastline were obtained from the MEGIS database (MEGIS 2004). Latitude and longitude in decimal degrees were geo-referenced using the Geographic Coordinate System North America 1983.

6. Error checking

Latitude and longitude in decimal degrees for existing and historical dam sites were confirmed or determined using the 26th (2003) and 30th (2007) editions of the DeLorme Maine Atlas and Gazetteer™ and Google Earth 5.0 during the period of January to July 2009. Additionally, personal site visits were conducted throughout the state of Maine in 2008 and 2009 to ground-truth over 90 dams with GPS and obtain information, photographs and meet with current owners and local residents.

Analysis

Virgin spawning habitat was dated in year 1600, pre European colonization. Historical river herring migratory and spawning habitat was estimated using stream and lake demographics from MEGIS (2004). Streams categorized as perennial on the MEGIS database that led to ponds within the estimated range of alewife migration were used to calculate potential stream migration distance whereas streams categorized as intermittent or not connected to water bodies above head of tide were not included. Perennial streams below or to head of tide but without connection to water bodies were included for potential blueback migratory and spawning habitat.

Let m be the river mouth and n_v the historical natural limit of migration; virgin habitat for alewife spawning (V_A), and blueback and alewife migration ($V_{BB,\ A}$), is the sum of all suitable lake (L, in km^2) and stream (S, in km) habitat, respectively, such that:

$$V_A = \sum_{m}^{n_v} L; \quad V_{BB,A} = \sum_{m}^{n_v} S,$$

Accessible habitat (h_A, $h_{BB,\ A}$) was then calculated chronologically from 1600 to 1900 each year a new obstruction occurred within the defined virgin habitat area, where n_x is the year specific upstream migration boundary:

$$h_A = \sum_{m}^{n_x} L; \quad h_{BB,A} = \sum_{m}^{n_x} S$$

Changes in accessible habitat (H_A, $H_{BB,A}$) resulting from dam construction was calculated using:

$$H_A = V_A - h_A; \quad H_{BB,A} = V_{BB,A} - h_{BB,A}$$

Then change from virgin conditions in percent (R_A, $R_{BB,A}$) since 1600 was calculated:

$$R_A = \frac{H_A}{V_A}100; \quad R_{BB,A} = \frac{H_{BB,A}}{V_{BB,A}}100$$

Results

Dam timeline

A total of 1356 historical and current dams were documented in the state of Maine from the Piscataqua/Salmon Falls River in the west to the St. Croix River in the east and all inlets and islands along the coast (Table 1). A comprehensive database with the history of each dam including use, dates of construction and reconstruction, owners, fish passage capability, hydrology, etc. can be viewed at the Gulf of Maine Historical Ecology Research website: www.GOMHER.org. Dams were grouped according to watershed access to coastal regions divided into western, central and eastern. Earliest construction of dams in the three regions was 1634, 1640 and 1763 for western, central and eastern, respectively. Of the

Table 1 Summary of historical and current dams in Maine by region and watershed[a]

Coastal region	Watershed	Total dams constructed 1600-present	Year of earliest documented dam construction	Number of dams still on watershed as of 2006[b]
Western	Piscataqua/Salmon Falls River	29	1634	12
	York River	12	1634	6
	Mousam River	24	1672	12
	Kennebunk River	10	1749	1
	Saco River	72	1648	42
	Fore River	6	1674	2
	Presumpscot River	68	1732	30
	Royal River	10	1722	4
Central	Kennebec River	226	1754	128
	Androscoggin River	145	1716	79
	Sheepscot River	47	1664	15
	Damariscotta River	8	1726	2
	Pemaquid River	6	1640	3
	Medomak River	12	1797	5
	St. George River	35	1647	18
	Penobscot River	283	1768	116
Eastern	Union River	36	1766	11
	Narraguagus River	15	1773	4
	Pleasant River	9	1765	2
	Machias River	13	1763	6
	East Machias River	12	1765	4
	Orange River	6	1828	4
	Dennys River	19	1787	8
	Pennamaquan River	18	1823	7
	St. John River	77	1811	48
	St. Croix River	48	1780	20
General	Coastal Waterways	110	1651	45
	Total	1356		634

[a] Includes dams that could not be assigned latitude and longitude

[b] Dams still present in 2006 at completion of the MEGIS impoundment database. Includes dams with fish passage and those more recently removed or breached

1356 dams documented in this study, 47% (634 dams) were still present on the waterways as of 2006. Not all of the locations of dams were identified clearly enough in the literature for exact, or estimated, latitude and longitude; therefore a total of 1333 dams were assigned coordinates and are presented in Fig. 2a.

Accumulation of dams across the state on all watersheds is mapped in four time periods: 1630–1750 (Fig. 2b), 1630–1800 (Fig. 2c), 1630–1850 (Fig. 2d) and 1630–1900 (Fig. 2e). A total of 43, 164, 187 and 521 dams were completed in each of the four time periods, respectively, for a total of 915 dams. Between 1750 and 1800, dam completion more than tripled and by 1900, increased 20-fold.

Dam development remained localized in the southwest of the state until northeast expansion in the mid 1700s (Fig. 2b, c). The rate of expansion to the east was more rapid than northern, or inland, but by 1850 the maximum range was reached in both directions while the density of dams continued to increase through the present (Fig. 2).

Historical habitat analysis

The Penobscot watershed had the most virgin habitat with 5332 km of streams and 327.7 km^2 of lake area whereas the Mousam watershed was the smallest with 183.5 km of streams and 10.7 km^2 of lake area (Table 2). From 1720 to 1846, impassable dams were

Fig. 2 Temporal and spatial accumulation of dams in Maine for which latitude and longitude were determined. Each dot represents a dam. **a** comprehensive of all dams completed through 2008. **b** all dams constructed by 1750. **c–e** the cumulative increase of completed dams in 50-year increments from 1750 to 1900

constructed at or near head of tide on the main stem of our nine historical river herring watersheds (Table 2). Head of tide dams alone reduced accessible stream distance and lake area to between 7–59% and 0–33%, respectively, having the greatest impact on the Kennebec, Mousam and Casco Bay watersheds with less than 1% of virgin lake surface area remaining after construction.

A representative watershed for each category is used to illustrate chronological changes in available spawning habitat. The Kennebec, St. George and Casco Bay represent primary, secondary and bay watersheds. See Supplementary Material II for

remaining watersheds. On the Kennebec watershed, considerable reductions in stream and lake habitat first occurred in 1754. Stream habitat declined to 65.4% and lake area to 53.6% (Fig. 3a). Dam construction in 1760 reduced lake area to 25.6% of virgin habitat and in 1792 further reduced habitat to 14.8% of streams and 4.8% of lake area. In 1837 the Edwards Dam was built at head of tide which reduced stream habitat to 6.9%. The last dams to have a measurable impact on the Kennebec watershed were completed in 1867 and left 4.9% and 0.4% of stream and lake area available, respectively.

Table 2 Nine focus watersheds with total virgin stream distance (SD) and lake surface area (LSA) in year 1600 for potential accessible river herring habitat, year of head of tide dam construction and percent remaining stream and lake habitat after full obstruction at head of tide[a]

Category	Watershed	Virgin SD (km)	Virgin LSA (km^2)	Year	% SD	% LSA
1	Androscoggin	906.2	45.9	1807	14.9	4.4
1	Kennebec	2392.3	197	1837	7.3	0.5
1	Penobscot	5332	327.7	1835	18.6	8.2
2	Mousam	183.5	10.7	1720	8.1	0
2	Sheepscot	558	19.4	1762	58.2	32.4
2	St. George	549.2	31.7	1840s	20.5	6.8
2	Union	480.9	93.2	1800	21.5	5.2
2	Dennys	230.1	30.1	1846	31.9	1.9
3	Casco Bay	862.1	136.1	1819	20.9	0.1

[a] Percent calculated based on presence of head of tide dam only. Habitat loss from other dams built on watersheds previous to above years or below head of tide not considered for this estimate

On the St. George watershed, the first notable reductions in available habitat occurred in 1777 resulting in 82.7% of stream and 72.2% of lake area remaining (Fig. 3b). Obstructed at head of tide in 1785, habitat was reduced to 18.9% stream and 4.9% lake area. The last dam to have a measurable impact on accessible spawning habitat was completed in 1867 leaving 13% stream and 0% lake habitat available.

Changes in available spawning habitat in Casco Bay were quite different between streams and lakes. Stream distance decreased 9.5% in fairly regular intervals until 1762 while lake area remained above 99% (Fig. 3c). Construction of a main stem dam on the Presumpscot River in 1762 reduced lake habitat to 3% and stream habitat to 57.8%. The Presumpscot River provides access to 116.4 km^2 Sebago Lake, the principal lake of the Casco Bay watershed. By blocking access to Sebago Lake, the dam obstructed nearly 97% of the watershed lake habitat but only about a third of the accessible stream habitat.

For an overall picture of Maine, the nine analyzed watersheds were combined (Fig. 3d). Remaining stream and lake habitat both decreased to below 50% by 1800 and were further reduced to 16.22% and 2.42% by 1900, respectively.

Discussion

This study provides the first comprehensive temporal and spatial analysis of dam construction as it relates to historical watersheds in Maine and determination of virgin baselines for diadromous river herring habitat. We illustrate the early history of anthropogenic fracturing of northeastern U.S. coastal ecosystems and consequent statewide loss of longitudinal connectivity and diadromous spawning habitat accessibility. From 1634 to 1850 mill dam construction on tributaries and small watersheds reduced Maine's river herring lake habitat by more than 95%. Large dams on primary rivers at head of tide led to a near total loss of accessible habitat by the 1860s. Legacy land use has diminished hydrologic connectivity within and among coastal ecosystems resulting in shifts to ecological form and function that must be recognized and incorporated explicitly into restoration.

Implications for restoration and management

While restoration and trending towards pre-colonial habitat have occurred since the American Civil War (Foster 2002), obstruction of waterways, especially at head of tide, has meant that waterways and diadromous fish are not experiencing the same trend. In light of our results, Atkins' (1887) underestimated lost habitat by an order of magnitude, and even the dire estimate of 1% remaining at present (Lotze and Milewski 2004) fails to identify that this baseline was reached 150 years ago, before industrial pollution and human-induced climate change had become widespread concerns. Historically, alewife migrated 193 km and 322 km inland on the Kennebec and Penobscot Rivers, respectively (Atkins and Foster 1868), but completion of head of tide dams restricted

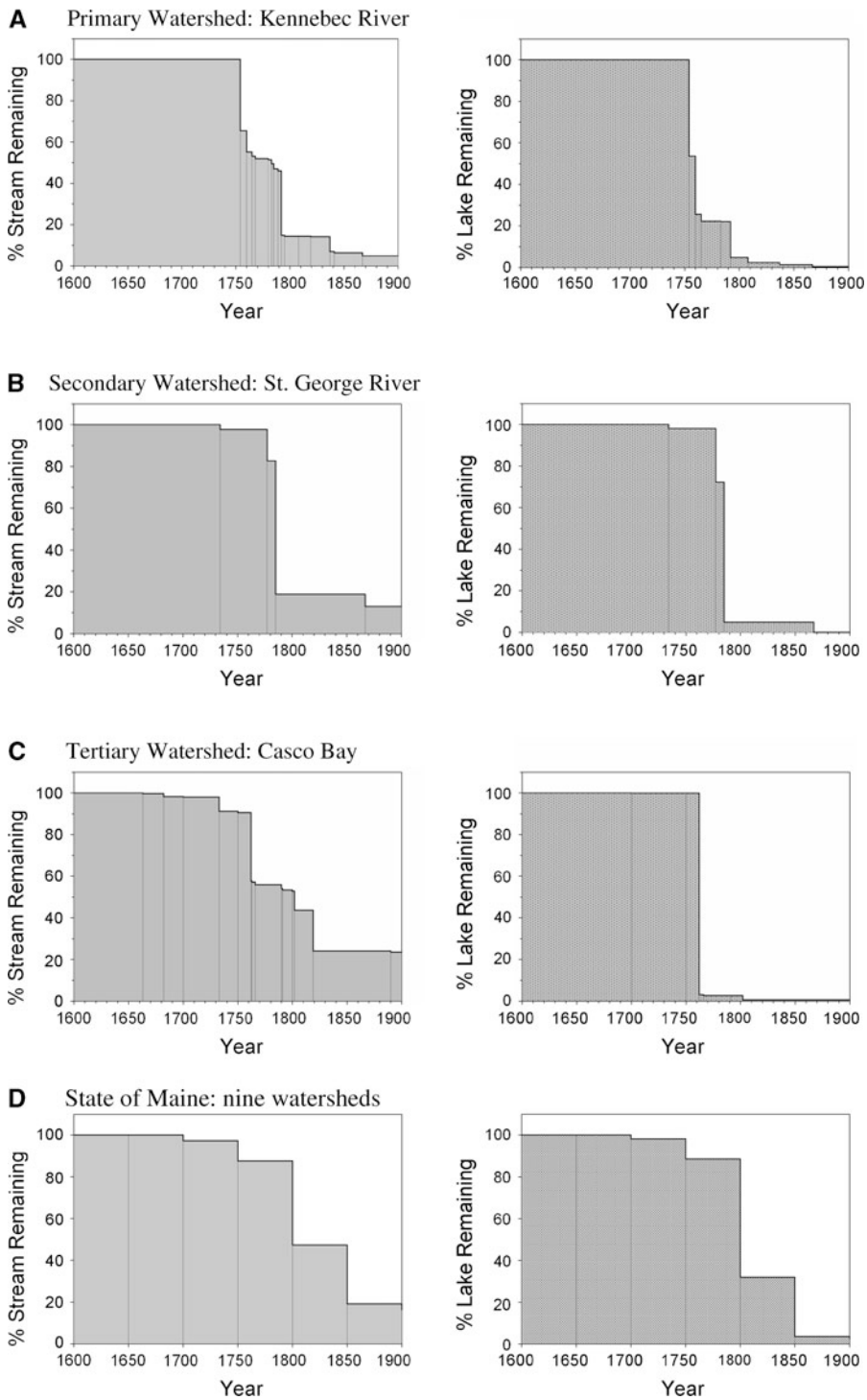


Fig. 3 Percent virgin habitat. Percent stream distance remaining (*on left*) and percent lake surface area remaining (*on right*) for representative watersheds of three categories and all nine assessed watersheds combined to represent the state: **a** primary rivers represented by the Kennebec River, **b** secondary rivers represented by the St. George River, **c** tertiary bay systems represented by Casco Bay and **d** state of Maine. Vertical drop down lines in each graph indicate year of dam construction that resulted in a measurable loss of potential spawning habitat

migration to less than 8% and 19% virgin habitat. Penobscot historical alewife catch declined from 1 million individuals in 1867 (Atkins 1887) to 230,283 in 1943 (Maine Department of Marine Resources unpublished data), documenting species decline due to habitat fragmentation and other factors. The extent of habitat loss during the 1800s left little spawning habitat accessible to wild populations along the Maine coast

with the Damariscotta River serving as the only consistent documented refuge for river herring (Maine Secretary of State 1804–1893). As a result, Damariscotta fish were likely responsible for repopulating other watersheds through straying and restocking efforts as habitat re-opened during the 1900s (Rounsefell and Stringer 1945). Increased population biocomplexity, where population structure includes access to a greater variety of spawning sites, improves species resilience in the face of environmental changes (Hilborn et al. 2003). Genetic and spatial variability of spawning populations would have been reduced from numerous discrete groups to as few as one, potentially endangering the resiliency of the species and possibly contributing to its current depleted status.

Over 100 years before recognition of the dramatic impacts of species loss, and advent of the Endangered Species Act, river herring were already at critically low population levels experiencing habitat conditions linked to genetic bottlenecks. The current IUCN Red List criteria for listing a species as "vulnerable" includes a 30% or greater loss of historic Area of Occupancy or Extent of Occurrence (IUCN Standards and Petitions Working Group 2008). Our study is far from global and does not conform to regional Red List guidelines' definition of a state or province (IUCN 2003). Yet, if our analysis can be assumed to represent the entire State, continued presence of migration barring dams contributing to 70% or greater loss of accessible habitat per watershed would merit a listing of "regionally endangered". Disruption of habitat-use and spawning migrations occurred during colonial development along the entire U.S. Atlantic coast (ASMFC 2009). An IUCN evaluation of river herring in watersheds throughout the greater Gulf of Maine, from Bay of Fundy in the north to Cape Cod in the south, would include numerous extirpated historical runs where the species is "regionally extinct" (IUCN 2003, p. 10). Subpopulation watershed loss could be the most important conservation parameter on a regional scale. Incorporation of assessments at watershed and subpopulation levels into regional river herring management efforts is critical and should be required.

Fortunately, alewives are ideal candidates for restoration because they rapidly populate reopened spawning habitat within 3–5 years, roughly equivalent to the species age of maturity (Atkins and Foster 1868; Pardue 1983; Lichter et al. 2006). Some progressive state management plans have implemented individual watershed restoration programs (Brown et al. 2008; MDMR 2008; Brady 2009) and currently there are numerous efforts in Maine to restore stream connectivity and diadromous fish habitat access through fish passage construction, dam removal and stocking with varying success. Fish passage over the head of tide Brunswick Dam in 1981 provided access to 53.8% of historical lake habitat for the Androscoggin watershed (Brown et al. 2008). Removal of the head of tide Edwards Dam in 1999, without unblocking additional upstream dams, allowed access to only 1% of potential lake habitat within the Kennebec watershed (MDMR 2008). Yet, removal of Fort Halifax Dam in 2008 at the mouth of the Sebasticook River provided access to 45% of the original lake habitat. Opening of these two dams potentially provided access to 46% of the Kennebec watershed's virgin lake habitat. Finally, planned removal of the main stem Great Works and Veazie Dams on the Penobscot would restore 37% of the Penobscot watershed's historical lake habitat (MBSRFH 2007; MDEP 2009), which with the already accessible Orland River would make 42% of historic lake habitat available. We propose that habitat is the best indicator of restoration success and efforts to reopen historical spawning habitat and apply management per watershed, in addition to larger coastal regions, is an important step towards restoring Gulf of Maine river herring.

Landscape and ecosystem impacts

Understanding the consequences of diadromous species' loss of access to spawning habitat is relatively straightforward compared to assessing their contribution to Gulf of Maine ecosystems, including as a nutrient vector between freshwater and marine environments. Extensive research on anadromous and semelparous (death after single spawning) Pacific salmon (*Oncorhynchus* spp.) has shown significant transport of marine derived nutrients to freshwater spawning sites and incorporation into aquatic and terrestrial food webs (Kline et al. 1990; Bilby et al. 1996; Schindler et al. 2003). River herring along the Atlantic coast could be equally important but differ from Pacific salmon by not providing as substantial an influx of nutrients through mortality. However, by returning to the marine environment multiple times, iteroparous river herring provide repeated exchange between fresh and marine aquatic systems. Short-

term research on small watersheds shows evidence of marine derived nutrient incorporation into freshwater ecosystems (MacAvoy et al. 2000; Walters et al. 2009). Long-term studies of river herring reintroduction and nutrient transport are needed to understand greater ecosystem impacts (Schindler et al. 2003).

Small-scale natural and human induced change to watershed morphology was not accounted for in our four-century analysis. To assess large-scale obstruction, we assumed stream distance and lake area remained consistent with values obtained from MEGIS (2004). As mentioned in the introduction, long-term presence of dams seriously affects water body characteristics and biological habitat availability (Poff and Hart 2002; Wu et al. 2004; Walter and Merritts 2008). Accurate estimates of these changes are difficult to obtain (Petts 1989; Poff et al. 1997) and require quantitative analyses of historical maps and sediment profiles to determine river width, depth and lake surface area over time. Also, small-scale natural (i.e: beaver dams) and human induced (i.e: road culverts) fragmentation was not assessed here. Inclusion of this work is necessary to improve understanding and management of localized landscape changes.

We have focused on the long-term destruction of river herring habitat. Substantial impacts on other diadromous species, including salmon, American eel (*Anguilla rostrata*) and shad, and their contributions to freshwater and coastal ecosystems were not considered. Consideration of all species implies a devastating loss of diadromous biomass from coastal food webs, as suggested for over 100 years (Baird 1872; Ames 2004). While trophically important river herring also potentially provide prey buffering for juvenile salmon from fish and bird predators (Fay 2003), restoration efforts have suffered because of perceived competition with sport fisheries (Willis 2006). Further, river herring as bycatch in marine fisheries such as Atlantic herring (*Clupea harengus*) is increasingly considered an impediment to successful restoration (Kritzer and Black 2007). Thus, recovery of one species does not occur in a vacuum.

While diadromous fish are impacted by obstructions to a greater degree than potamodromous species (Cote et al. 2009), fragmentation of rivers, isolation of lake and stream habitat, rapid increase of impoundments combined with deforestation and other land-use changes that accompanied dams, have altered landscape ecology and affected all species (Foster et al. 2003). Fragmentation, land clearance and conversion to pasture land co-occurred with mill development. Thus, the documentation of damming is an indicator of regional changes to the landscape, including loss of foundation species (Ellison et al. 2005), shifts in species and habitats, nutrient composition, soil and sediment structure, presence of woody debris and overall flora and fauna (Foster et al. 2003). When the scale of alteration is considered (Walter and Merritts 2008) in relation to hydrologic connectivity and the relative strengths and directionality of hierarchal processes (Poole 2002), a dramatic shift from habitat continuum to discontinuum, not only within stream networks, but across the freshwater-oceanic boundary, has occurred. Further, punctuated discontinuities across the landscape together with homogenization of forests at the regional scale (Foster et al. 1998) have shifted the biotic structure and nutrient flux of Maine's ecosystems. Today, the terrestrial, riverine and marine landscape of Maine favors shorter-lived rapid growing species compared to pre-colonial ecosystems (Foster et al. 2002). A systematic and comprehensive plan is required to determine minimum habitat connectivity and species restoration targets, with multi-level involvement from individual watersheds to coast-wide management. Finally, by comparing current watershed restoration results to baseline habitat and productivity estimates we can determine the effectiveness of proposed actions towards regaining ecological connectivity after centuries of watershed obstruction.

Acknowledgments This work has benefited from conversations with Robert M. Cerrato, William Leavenworth, Karen Alexander, Theodore Willis, Michele Dionne, Gail Wippelhauser and Tom Squiers. We are indebted to the staff of The Maine Historical Society, The Maine State Archives, The Fogler Library Special Collections at the University of Maine Orono, and The Bangor Public Library Local History/Special Collections. We would like to thank J Wu, G Poole, D Cote and 1 anonymous reviewer for comments that improved this manuscript. We also thank undergraduate researchers Jaime Wright and Veronica Scorcia. This research was funded by a 2007 Mia J. Tegner Memorial Research Grant in Marine Historical Ecology and Environmental History (awarded to Adrian Jordaan) and NOAA award NA07NMF4550320.

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EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

June 4, 2012

Mr. Daniel Morris, Acting NMFS Regional Administrator
Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930
MSBAmendment14@noaa.gov

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 N. State St
Dover, DE 19901
cmoore@mafmc.org
jdidden@mafmc.org

Re: Public Comment on Draft Amendment 14 to the Mackerel, Squid, and Butterfish Fishery Management Plan and its Draft EIS No. 20120106. *See* Notice Of Availability, 77 Fed. Reg. 23713 (Apr. 20, 2012).

Dear Mr. Morris and Dr. Moore,

On behalf of Michael S. Flaherty, Captain Alan Hastbacka, the Ocean River Institute, and the Herring Alliance, please accept these comments on Amendment 14 and its Draft Environmental Impact Statement. It is our clients' view that blueback herring, alewife, American shad, and hickory shad must be added to the Mackerel, Squid and Butterfish Fishery Management Plan ("MSB 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 Mid-Atlantic Council should select Alternatives 9b-9e in the Amendment 14 DEIS to add these species as "stocks in the MSB FMP," and immediately begin a trailing amendment to set the actual annual catch limits, accountability measures, and other required management measures.

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 selection of Alternatives 9b-9e. Please include all of these documents in the Amendment 14 administrative record and ensure that they are considered as part of your deliberations on Amendment 14:

1. The National Marine Fisheries Service (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 Attachment 1.

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

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 Attachment 2 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 Attachment 3 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. 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 Attachment 4.

The Herring Alliance intends to provide further detailed comments on Amendment 14 supporting the addition of these species to the MSB FMP. These additional Herring Alliance comments are supported by Mr. Flaherty, Captain Hastbacka, and the Ocean River Institute and should be considered on their behalf as well.

Thank you for considering these comments.

Sincerely,

/s/ Roger Fleming
Roger Fleming, Attorney
Erica Fuller, Attorney
Earthjustice
rfleming@earthjustice.org
efuller@earthjustice.org

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

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 NMFS[2] 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

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 Campaign 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 herring[21] 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).

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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.

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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

June 4, 2012

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 N. State St., Suite 201
Dover, DE 19901

Dear Dr. Moore:

The Herring Alliance is writing in response to the Mid-Atlantic Fishery Management Council's (MAFMC or Council) request for public comments on the Draft Environmental Impact Statement for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish (MSB) Fishery Management Plan.

The Herring Alliance seeks to ensure that Amendment 14 includes management measures that will protect river herring and shad, promote their long-term recovery, and have the most positive biological impact:

Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish (Alternative 9b-9e) would afford river herring and shad the conservation and management they direly need.

Almost two years ago, we wrote to express concern about the status of river herring and shad. Specifically, we asked the MAFMC to carefully analyze the negative impacts that midwater trawlers in the Atlantic mackerel fishery have on these important and imperiled forage fish.[1] Since then, the Herring Alliance has grown from 17 to 52 regional, national and international organizations, concerned about the status of the Atlantic coast's forage fish. Our growth demonstrates the expanding consciousness about the critical role that forage fish play in the food web and the concern for their enduring depletion.

The Council would be remiss to choose any options that fail to recognize and address the depleted status of river herring and shad, their signature ecological role, and the indelible threat to their survival presented by the Atlantic mackerel fishery. The Council must do this by implementing all of the following for river herring and shad in the MSB fishery: robust monitoring, bycatch and incidental catch reduction, and overall catch limits. The recovery of river herring and shad is being impeded by incidental catch at sea,[2] including mortality caused by mid-water trawlers targeting Atlantic mackerel.[3] According to the Northeast Science Center, millions of river herring and shad every year are ensnared and killed by a fleet of approximately 20 midwater trawlers.[4] These trawlers account for 71 percent of the coastwide at-sea catch.[5] In addition to including river herring and shad as stocks within the mackerel, squid, butterfish fishery **(Alternative 9b-9e)**, it is imperative that the Council take immediate steps to curb this catch by immediately implementing the following:

- An interim cap, or limit, on river herring and shad catch **(Alternative 6b-6c)** that functions effectively, does not increase wasteful discarding, and cannot be circumvented.

[1] http://herringalliance.org/images/stories/Scoping_Comments_MSB_14_Herring_Alliance_0709_2010.pdf
[2] ASMFC River Herring Benchmark Stock Assessment, May 2012, Executive Summary.
[3] Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish FMP DEIS, April 2012, pp.220.
[4] Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish FMP, May 2011, Tables 94-96, pp. 447-448.
[5] Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish FMP DEIS, April 2012, Appendix 2, Table 3.

- Close river herring hotspots to directed squid and mackerel fishing**:** the MAFMC should close the "River Herring Protection Areas" identified by the New England Fishery Management Council in Amendment 5 to the Herring Plan (**Alternatives 8eMack and 8eLong)** and also create a mechanism under which the larger "River Herring Monitoring/Avoidance Areas" identified in Amendment 5 could be closed through a future Framework Adjustment (**Modified Alternative 8b).**
- 100 percent at-sea monitoring on all midwater trawl fishing trips, including assigning one observer to each pair trawl vessel **(Alternative 5b4 and Alternative 3d).**
- An accountability system to discourage the wasteful dumping of un-sampled 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)**.

Coast-wide, we have done a tremendous amount of work in state waters to restore our river herring and shad populations. Now it is time for the Council to do everything it can in federal waters to bring back these iconic species that have been an integral part of coastal community life for centuries. An effective management strategy hinges on the ability to develop a single, comprehensive and coordinated strategy to reduce ocean bycatch for all of the Northeast industrial small-mesh fisheries including the Atlantic mackerel and Atlantic herring fisheries. We look forward to your action on these priority issues.

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

Howard King
240 Harbor Lane
Queenstown, MD 21658

Steven Linhard
1004 Jackson Street
Annapolis, MD 21403

Mike Luisi
Maryland DNR
Tawes State Office Bldg, B-2
580 Taylor Avenue
Annapolis, MD 21401

June 4, 2012

Dear Maryland Council Members:

We represent 18 Maryland based organizations and are writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad by including robust, science-based conservation and management measures in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan.

Maryland's rivers once teemed with river herring and shad, providing an abundant food source for wildlife, opportunities for commercial and sport fishing, and a wildlife viewing experience that delivered ocean bounty to our towns. Many of us have spent countless hours working to restore river herring and shad runs in Maryland, monitoring water quality and cleaning up waterways. The Maryland legislature has dedicated millions of dollars towards restoring our coastal estuaries and rivers by regulating pollution and restoring habitat. Maryland recently implemented a moratorium on commercial and recreational fishing for river herring. American shad fisheries have been closed since 1980 with the exception of a small catch and release fishery. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes recovery. The Northeast Fisheries Science Center estimates that millions of river herring and shad are caught every year by industrial mackerel and Atlantic herring trawlers operating in federal waters. We are encouraged that the MAFMC and New England Fishery Management Council are currently developing plans to address this problem. We ask the MAFMC to set the standard for protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.
- An interim cap or limit in 2013 on river herring and shad catch in the mackerel fishery.
- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.
- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.
- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for your consideration.

Bill Goldsborough, Director of Fisheries Program
Chesapeake Bay Foundation
Annapolis, MD

Tommy Landers, Director
Environment Maryland
Baltimore, MD

Claudia Friedezky, Conservation Representative
Maryland Chapter of the Sierra Club
College Park, MD

Karla Raettig, Executive Director
Maryland League of Conservation Voters
Annapolis, MD

Jacquelyn Bonomo, Executive Director
Audubon Maryland/DC
Baltimore, MD

David Curson, Director of Bird Conservation
Audubon Maryland/DC
Washington, DC

Steven Mickletz, Naturalist & Manager of Public Programs
Irvine Nature Center
Owings Mills, MD

Karen Lukacs, Executive Director
Wicomico Environmental Trust
Salisbury, MD

Drew Koslow, Riverkeeper
Choptank Riverkeeper
Cambridge, MD

Timothy Junkin, Executive Director
Midshore Riverkeeper Conservancy
Easton, MD

David Foster, Riverkeeper
Chester River Association
Chestertown, MD

Tina Meyers, Baltimore Harbor Waterkeeper
Blue Water Baltimore
Baltimore, MD

Eric Michelson, Executive Director
South River Federation
Edgewater, MD

Chris Trumbauer, Executive Director
West Rhode Riverkeeper
Shady Side, MD

Joseph Henderson, Manager
Buzz's Marina
Ridge, MD

Daniel Campbell, Coast Guard Master
Buzz's Marina
Ridge, MD

Russell Hudson, Owner
Chesapeake Classics LLC.
Cambridge, MD

Debbie Drury, Owner
Drury's Marina
Ridge, MD

Donald George Foster, Manager
The Tackle Box
Lexington Park, MD

Mayor James Ireton, Jr.
City of Salisbury
Salisbury, MD

Jim Gilmore
NYSDEC Bureau of Marine Resources
205 Belle Meade Rd
E. Setauket, NY 11733

Stephen Heins
NYSDEC Bureau of Marine Resources
205 Belle Meade Rd
E. Setauket, NY 11733

June 4, 2012

Dear Council Members:

We represent New York fishermen, businesses, and conservation organizations concerned about the incidental catch of millions of river herring and shad each year at sea. We are writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad. Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, should include robust, science-based conservation and management measures that provide coastwide protection for these depleted species.

New York's coastal communities are culturally connected with our state's historic river herring and shad runs. Their spring return once provided opportunities for recreational fishing, supported in-river commercial fisheries that in turn sustained small river towns, and filled our estuaries with a staple food for wildlife. Many of us have spent countless hours working to restore river herring and shad habitat in New York, monitoring water quality and cleaning up waterways. Our state and local governments have devoted millions of dollars towards restoring our river herring and shad runs by regulating pollution and restoring spawning grounds. New York has strict limits on recreational fishing for river herring and imposed a moratorium on the recreational and commercial fishing for American shad in the Hudson River and the Marine and Coastal District of New York. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes their recovery. The Northeast Fisheries Science Center estimates that industrial trawlers operating in federal waters catch millions of river herring and shad every year. Immediate action is needed to curb the catch of these depleted species at sea. As our designated state officials to the Council, we are asking you to break the logjam on protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in federal waters.

- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.

- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for the opportunity to submit these comments on this important fishery management plan.

Signed,

Alpha Adventures, Inc
Capt. Adrian Mason
New York

Audubon New York
Sean Mahar
Director of Government Relations
and Communications
Albany, New York

Citizens Campaign for the Environment
Adrienne Esposito
Executive Director
Farmingdale, New York

Environment New York
David Van Luven
State Director
New York, New York

Friends of the Bay
Patricia Aitken
Executive Director

Hudson Riverkeeper
Joshua S. Verleun
Staff Attorney
Ossining, New York

Natural Resources Defense Council
Brad Sewell
Senior Attorney
New York, New York

Natural Resources Protective Association
Jim Scarcella
Director
Staten Island, New York

Peconic Baykeeper
Kevin McAllister
Baykeeper & President
Quogue, New York

Scenic Hudson, Inc.
Sacha Spector, PhD
Director of Conservation Science
Poughkeepsie, NY

Seatuck Environmental Association
Enrico G. Nardone, Esq.
Executive Director
Islip, New York

Shark Angels
Jamie Pollack
Director

Sierra Club, Long Island Group
Bill Stegemann
Conservation Chair

Wildlife Conservation Society
John F. Calvelli
Executive Vice President for Public Affairs
Bronx, New York

cc. Governor Cuomo
Dr. Chris Moore

G. Warren Elliott
822 Shatzer Orchard Road
Chambersburg, PA 17202

John Arway, Executive Director
Pennsylvania Fish & Boat Comm.
1601 Elmerton Avenue
Harrisburg, PA 17110-9299

David Miko, Chief
Division of Fisheries Mgmt.
Pennsylvania Fish & Boat Comm.
450 Robinson Lane
Bellefonte, PA 16823-9616

June 4, 2012

Dear Council Members:

We represent Pennsylvania fishermen, businesses, and conservation organizations concerned about the incidental catch of millions of river herring and shad each year at sea. We are writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on management of river herring and American shad in federal waters where the bulk of this at-sea catch is occurring. Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, should include robust, science-based conservation and management measures that provide coastwide protection for these depleted species.

Pennsylvania's river communities are culturally connected with our state's historic river herring and shad runs. Their spring return once provided opportunities for recreational fishing, supported in-river commercial fisheries into central Pennsylvania that in turn sustained small river towns, and filled our estuaries with a staple food for wildlife. Many of us have spent countless hours working to restore river herring and shad habitat in Pennsylvania. Our state and local governments have devoted millions of dollars towards restoring our river herring and shad runs by regulating pollution and restoring spawning grounds. The initial effort in our state's shad restoration began in 1866 with the formation of what is today the Pennsylvania Fish and Boat Commission. In fact, shad restoration was the driving force behind the formation of the Commission. As part of our historic commitment to restore these forage fish, Pennsylvania imposed a moratorium earlier this year on recreational and commercial fishing for river herring and similar restrictions on American shad are imminent. But, more work needs to be done in federal waters to recover these depleted fish, most importantly new monitoring, bycatch reduction, and bycatch limitation measures.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes their recovery. The Northeast Fisheries Science Center estimates that industrial trawlers operating in federal waters catch millions of river herring and shad every year. Immediate action is needed to curb the catch of these depleted species at sea. The Pennsylvania Fish and Boat Commission has long understood the importance of these fish to our state's recreational fisheries and river ecology. We are asking you to break the logjam on protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in federal waters.

- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.

- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for the opportunity to submit these comments on this important fishery management plan.

Signed,

Melinda Hughes-Wert, President
Nature Abounds
Clearfield, PA

Donna Smith-Remick, President
Friends of Poquessing Watershed
Philadelphia, PA

Michael Helfrich, Lower Susquehanna Riverkeeper
Stewards of Lower Susquehanna, Inc. (SOLS)
York, PA

Thomas Y. Au, Conservation Chair
Sierra Club, Pennsylvania Chapter
Harrisburg, PA

Steve Oliphant
Susquehanna Outfitters
Harrisburg, PA

Tom Fuhrman
Lake Erie Region Conservancy
Erie, PA

Myron Arnowitt, Pennsylvania State Director
Clean Water Action
Pittsburgh, PA

Bart Larmouth, Manager
FFF Certified Casting Instructor
Delaware River Club
Starlight, PA

Dorsey D. O'Connell, Assistant Secretary
Beaver Creek Anglers, Inc.
Pittsburgh, PA

Scott McDonough, President
Delaware River Fishermen's Association
Philadelphia, PA

Steve Stroman, Policy Director
Citizens for Pennsylvania’s Future (PennFuture)
Harrisburg, PA

Bob Hetz, Nursery Manager
3-C-U Trout Association
Fairview, PA

Joseph Otis Minott, Esq., Executive Director
Clean Air Council
Philadelphia, PA

Brenda L. Smith, Executive Director
Nine Mile Run Watershed Association
Pittsburgh, PA

Rev. Dr. A. Glenn Williams, President
Anderson Creek Watershed Association
Curwensville, PA

James E. Jordan, Jr., Executive Director
Brandywine Valley Association
Red Clay Valley Association
West Chester, PA

Victoria Laubach, Executive Director
Green Valleys Association of Southeastern PA
Pottstown, PA

Phil Wallis, Executive Director
John James Audubon Center at Mill Grove
Audubon, PA

Christopher M. Kocher, President
Wildlands Conservancy
Emmaus, PA

Diane M. Lengle, President
Lower Penns Creek Watershed Association
New Berlin, PA

Mike Ansel, Vice-President
Cocalico Sportsmen Association
Denver, PA

Steven Brugger, Owner
Lake Erie Ultimate Angler
Erie, PA

Jerry Potocnak, President
Arrowhead Chapter Trout Unlimited
Sarver, PA

Beverly Braverman, Executive Director
Mountain Watershed Association
Melcroft, PA

Linda Sieber, Chair
Sherman's Creek Conservation Association
Shermansdale, PA

Katie Donnelly, Associate Director
Tookany/Tacony-Frankford Watershed Partnership
Philadelphia, PA

Homer S. Wieder, Chairman
Susquehanna River Heartland Coalition for Environmental Studies
Lewisburg, PA

Patrick Grenter, Esq., Executive Director
Center for Coalfield Justice
Washington, PA

Larry Gould, President
Tobyhanna Creek/Tunkhannock Creek Watershed Association
Pocono Lake, PA

Adam Garber, Field Director
PennEnvironment
Philadelphia, PA

Pam Brown, Conservation Director
French & Pickering Creeks Conservation Trust
Phoenixville, PA

Cc: Governor Corbett

The Nature Conservancy
Protecting nature. Preserving life.™

June 4, 2012

Christopher M. Moore
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
via email msbamendment14@noaa.gov

Re: DEIS for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan

Dear Dr. Moore:

The Nature Conservancy offers the following comments on the DEIS for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan.

The mission of The Nature Conservancy (the Conservancy) is to conserve the lands and waters on which all life depends. With the support of more than one million members, the Conservancy has protected more than 120 million acres and 5,000 river miles around the world. We currently run more than 150 marine conservation projects in 32 countries and every coastal state in the U.S.

Through its work with both freshwater and marine species and habitats, the Conservancy helps to connect terrestrial, freshwater and marine conservation efforts by building on the Conservancy's network of partners and innovative approaches developed at sites around the world to pursue integrated coastal conservation. Shad and river herring provide a vital link in both freshwater and marine food webs and require an integrated conservation approach that crosses habitats and political boundaries. They are a focus of our work all along the Atlantic coast, under a comprehensive restoration strategy that aims to address access to and from spawning habitats and habitat restoration, as well as fishing rates.

River herring and American shad populations are at historic lows and have shown little sign of recovery despite considerable efforts to improve river habitat and protect remaining populations. Bycatch in federal waters is likely to be an important factor affecting river herring and shad rebuilding efforts and we urge the MAFMC to adopt measures to monitor and reduce incidental catch of these species.

Alternative Set 1 and 2: Reporting Measures

The Nature Conservancy supports measures that improve catch reporting and accounting for all catch, including river herring species. We support VTR submissions required on a weekly basis

throughout all MSB fisheries, 72-hour pre-trip notification for observer placement and 6-hr landing notification. In addition, a mechanism is needed to provide accurate information on the weight of fish taken, while allowing some flexibility to account for regional and gear differences.

Alternative Set 3: Additional At-Sea Observation Optimization Measures

We support all of the alternatives that require vessels to cooperate with the observer program, recognizing that these practices are currently the norm. There are currently no requirements or disincentives for MSB-permitted vessels to avoid slipping hauls; we support increasing accountability by establishing a cap on slippage events that results in trip termination after 5 slipped hauls.

Alternative Set 4 & 5: Port-side and At-Sea Observer Coverage Requirements

Effective monitoring is a foundation of management and monitoring/reporting in small mesh fisheries must be improved. We support mandatory reporting coupled with monitoring programs adequate to reliably estimate bycatch for the entire fishery. Due to their capacity to catch large volumes of RH/S at once, the largest vessels are the highest priority for new investment in monitoring. Smaller vessels also have an impact on RH/S mortality and require an appropriate level of monitoring; Observer coverage needs to increase to adequately cover gear types, range, and seasonality of MSB fisheries to 100% monitoring for large vessels and below .3 CV for SMBT. Combinations of observers, portside, and (ultimately) electronic monitoring should be considered to provide the most statistically valid and cost-effective data.

Alternative Set 6, 7, 8: River Herring Catch Caps and Closed Areas

A regulatory limit on RH/S mortality in ocean fisheries is a necessary incentive for full, continuous participation in practices to reduce bycatch. With a cap there are many potential co-management options, including examples like the SFC/SMAST bycatch avoidance project. The Conservancy is a funding partner in the project. This project should continue and the information derived from this project used to inform the development of management measures and harvest practices to avoid RH/S bycatch. Ultimately, the Council should establish a biologically based cap on RH/S mortality; however until that happens, an interim approach for limiting RH/S bycatch is needed.

The lack of consensus between the FMAT and PDT on the best approach points to tradeoffs between the costs and benefits of caps and closed areas. The most important consideration is that the poor condition of RH/S coastwide is clear, even without formal reference points, and mortality must be reduced. It is highly unlikely that up to 5 million river herring and 600,000 shad annually represent a sustainable level of catch at sea.

An interim catch cap based on recent catches would at least begin to address the problem of excessive mortality. Given that both river herring and shads are impacted by bycatch, caps for both groups of species are needed. Due to high co-incidence of river herring and shad bycatch, the areas identified in the spatial management alternatives could work for both.

It would make most sense to have a fleet-area cap (e.g., midwater trawls in Mid-Atlantic) rather than using the regulatory definition of a "Mackerel" or "Herring" trip to define vessels that are subject to the cap. Amendment 5 contains provisions for a cap to be added later.

Significant biological and genetic research is currently taking place to assess the impact of nearshore bycatch events on populations of shad and river herring. It is important that as many provisions as possible be frameworkable or handled in specifications to allow for adaptive management to meet the goal of reducing bycatch and increasing RH/S populations.

Alternative Set 9: Adding RH/S as "Stocks in the Fishery" in the MSB FMP.
The poor condition of RH/S, and the fact that significant numbers of these species are caught in Federal-water fisheries, suggests that extension of provisions of the Magnuson Stevens Act, such as ACLs, EFH, and rebuilding timeframes may be warranted. In any case, it is critical to adopt measures to monitor and reduce incidental catch of these species, as described above, to complement state waters conservation measures.

We applaud the Councils and ASMFC for their efforts to create a unified approach to bycatch reduction across habitats and jurisdictions. Due to the important role of these species as forage fish, we look forward to articulation of ecosystem level goals and objectives informed by the ongoing work of the ecosystem subcommittee of the Scientific and Statistical Committee.

The Conservancy welcomes the opportunity to work with the MAFMC, NEFMC, ASMFC and other partners to support appropriate funding to quantify bycatch in ocean fisheries, as well as for funds needed to implement recommendations for conservation and restoration of habitats for diadromous fishes.

We appreciate the opportunity to provide comments to the scoping document for Amendment 14. If you have any questions, please contact Alison Bowden at 617-532-8360 or abowden@tnc.org. Thank you for your consideration and we look forward to collaborating with the Council in supporting improved management of the SMB and Atlantic herring fisheries as well as recovery efforts for river herring and other species.

Sincerely,

Lise A. Hanners

Lise A. Hanners, Ph.D
Director of Conservation, Eastern U.S. Conservation Division

THE PEW ENVIRONMENT GROUP

June 4, 2012

Dr. Christopher Moore
Mid-Atlantic Fishery Management Council
800 N. State Street
Suite 201
Dover, DE 19901

Mr. Daniel Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2298

RE: AMENDMENT 14

Dear Dr. Moore:

The Pew Environment Group has collected **27,981** comments in response to the Draft Environmental Impact Statement for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan. Specifically, these comments ask the Council to:

- **Include river herring and shad as stocks within the fishery. (Alternative 9b-9e).**
- 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.
- 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**). I have attached the comment letter that was signed by each person on the attached list.

I have attached a list with the name, city and state of each person who signed the attached letter.

Thank you,

Theresa Labriola,
Senior Associate, Northeast Fisheries Program
Pew Environment Group

June 4, 2012

Dr. Christopher Moore
Mid-Atlantic Fishery Management Council
800 N. State Street
Suite 201
Dover, DE 19901

Mr. Daniel Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2298

Dear Mr. Daniel Morris and Mr. Chris Moore:

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 our efforts to restore our estuaries and rivers.

River herring and shad populations are at historic lows and have declined coastwide 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, 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 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.

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**).
- 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 the opportunity to comment and for your commitment to these priority reforms.

Sincerely,

First Name	Last Name	City	State	Comments
Merritt	Andruss	Juneau	AK	
charlene	austin	anchorage ak	AK	
Angelo	Barry	Anchorage	AK	
Steven	Bergt	Anchorage	AK	
Gerald	Brookman	Kenai	AK	
Tasha	Brooks	EAGLE RIVER	AK	
Ronn	Brown	Wasilla	AK	
barbara	brown	wasilla	AK	
Jessica	Bush	Anchorage	AK	
sybille	castro	Kenai	AK	
shamarie	coomler	WASILLA	AK	
deanna	cox	Ketichikan	AK	
Annie	Dlima	Apo	AK	
Maija	Dreimane	Anchorage	AK	
karen	dupont	Wasilla	AK	We are all subject to the food chain. Enough of the race off of the cliff mentality!
alyssa	enyart	Anchorage	AK	Dolphins are amazing creatures who deserve respect the save the life of human beings. If Japan dosn't want the dolphins there america would love to have them in their sea. aquirems should'nt be here the animals deserve to be free!
Linda	Falcone	Homer	AK	
Cecile	Ferrell	Ketchikan	AK	
Louis	Fisher	Elfin Cove	AK	
Hugh	Fleischer	Anchorage	AK	
Jelena	Fliehman	Homer	AK	
corinna	forbrich	G√°strow	AK	
Melissa	Frost	Eagle River	AK	
Ken	Gibb	Anchorage	AK	
NINA	GONDOS	FRANKSTON	AK	
Yvonne	Gonzalez	ANCHORAGE	AK	
Jessica	Grantier	Anchorage	AK	
Rita	Hendrickson	Anchorage	AK	Because I live on this planet and do not want to destroy any fishery
Janeen	Herr	Anchorage	AK	
Kevin	Howell	North Pole	AK	
Zara	Ivanova	Anchorage	AK	
BRADY	JACKSON III	PALMER	AK	
Elizabeth	Jacobs	Anchorage	AK	
Sherry	Kimmons	Wasilla	AK	
Karlene	Kotulak	Anchorage	AK	its important to retain balance, you cannot retain balance if you consume faster than growth.
Charlotte	Lee	Anchorage	AK	
christel	ling	COPPER CENTER	AK	
Dee	Longenbaugh	Juneau	AK	
Flo	Madriaga	ANCHORAGE	AK	
Bonnie	McCartney	Anchorage	AK	
malia	mcinerney	juneau	AK	
Casey	Muir	Chugiak	AK	
Pam	Nelson	Juneau	AK	
Ralph	Newball	Old Providence Island	AK	

Natural Resources Defense Council
40 West 20th Street
New York, NY 10011
Tel: (212) 727-2700
Fax: (212) 727-1773

Via Email (msbamendment14@noaa.gov) and U.S. Mail

June 1, 2012

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 N. State St., Suite 201
Dover, DE 19901

Re: Comments on Amendment 14 to the Mackerel, Squid & Butterfish FMP

Dear Dr. Moore,

Please accept the following comments from the Natural Resources Defense Council (NRDC) on Amendment 14 to the Mid-Atlantic Fishery Management Council's (MAFMC's or Council's) Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP). We commend the MAFMC for initiating this management action to protect severely depleted populations of river herring and shad from further decline and to begin rebuilding these populations to healthy levels. The status of these species, combined with significant unregulated fishing mortality in the MSB fishery, requires robust and immediate conservation and management in federal waters. The Draft Environmental Impact Statement (DEIS) for Amendment 14 sets out a suite of measures that, if adopted, could address current management gaps.

For the reasons stated below, we believe that the Council and NMFS are legally obligated to designate and manage river herring and shad as "stocks in the fishery." As implementing management measures resulting from this decision will take a period of time, we also believe that, in the interim, a number of proposed management actions to provide monitoring and accounting for river herring and shad fishing mortality, and limiting that mortality to sustainable levels, are necessary. Accordingly, we urge the Council to select the following actions:

- Designate and manage river herring and shad as "stocks in the fishery" **(Actions 9b-9e).**
- Implement mortality caps for river herring and shad in the Atlantic mackerel fishery **(Actions 6b-6c)** and permit the setting of mortality caps through framework actions **(Action 6f)**.
- Adopt 100 percent at-sea monitoring on all mid-water trawl fishing trips **(Action 5b4)** and require at least one observer to each vessel in a pair trawl operation **(Action 3d)**.

- Ensure all catch is made available to fishery observers for systematic sampling **(Action 3j)**, include a fleet-wide limit of 10 dumping events **(Actions 3l and 3n)**, and require vessels that dump to take an observer on their next trip **(Alternative 3o)**.
- Require dealers to weigh all catch **(Actions 2c-2f)** and to obtain vessel representative confirmation of landings **(Action 2b)**.
- Require weekly vessel trip reports **(Action 1c)**, vessel monitoring systems (VMS) **(Actions 1eMack and 1eLong)**, and daily VMS reports **(Actions 1fMack and 1fLong)**.

River Herring and Shad Are Severely Depleted and Require Robust Federal Management

The four species of river herring and shad included in Amendment 14 – alewife, blueback herring, American shad and hickory shad (hereafter collectively referred to as river herring and shad) – are severely depleted and in need of conservation and management. For example, river herring catch levels have plunged almost 99 percent from pre-1970 levels and the National Marine Fisheries Service (NMFS) is considering designating the two species, which are already on the agency's "Species of Concern" list, as "threatened" under the Endangered Species Act.[1] The Atlantic States Marine Fisheries Commission (ASMFC) has implemented moratoria on river herring and shad fishing within state waters unless sustainability of such catch can be demonstrated.

Recent stock assessments for river herring and shad have documented significant declines for these species and have identified fishing mortality from ocean fisheries as contributing to these declines. The 2011 river herring stock assessment concluded that 23 alewife and blueback herring populations were depleted, one stock was increasing, and the status of 28 other stocks were unknown due to data limitations.[2] The stock assessment report found that additional management is required:

> "Due to the poor condition of many river herring stocks, management actions to reduce total mortality are needed. These could include reductions in directed commercial or recreational fishery mortalities, reductions in total incidental catch (retained and discarded fish), habitat restoration, and improvements in upriver and downstream fish passage."[3]

The most recent American shad stock assessment also found severely-depleted population levels, as the DEIS for Amendment 14 summarizes:

> "The 2007 American shad stock assessment found that stocks were at all-time lows and did not appear to be recovering to acceptable levels. It identified the primary causes for the continued stock declines as a combination of excessive

[1] 76 Fed. Reg. 67652 (Nov. 2, 2011).
[2] ATLANTIC STATES MARINE FISHERIES COMMISSION (ASMFC), *River Herring Stock Assessment Overview* (May 2012).
[3] ASFMC, Stock Assessment Report No. 12-02, *River Herring Benchmark Stock Assessment, Volume I*, *Section C, River Herring Stock Assessment Report for Peer Review," at* 58 (May 2012).

> total mortality, habitat loss and degradation, and migration and habitat access impediments. Although improvement has been seen in a few stocks, many remain severely depressed compared to their historic levels."[4]

Various factors have contributed to the severe decline of river herring and shad populations along the Atlantic. While the relative contribution of each of these sources to the decline is difficult to estimate precisely, it is beyond dispute that fishing mortality from the ocean-intercept fishery continues to play a significant role. Incidental catch of river herring and shad by ocean-intercept fisheries – averaging an estimated 459 metric tons of river herring and 63 metric tons of shad per year – comprises a substantial share of overall fishing mortality of these species.[5] By comparison, from 2005-2010, river herring and shad landings averaged 601 and 581 metric tons, respectively.[6]

The DEIS for Amendment 14 recognizes the following shortcomings of current management of river herring and shad:

- Low levels of catch monitoring, resulting in relatively high uncertainty about incidental catch of river herring and shad,
- MSB fisheries "may be negatively impacting [river herring and shad] populations,"
- No limits on incidental catch of river herring and shad in federal fisheries, and
- Existing federal/state/regional management framework "may be insufficient to adequately conserve river herring and shad stocks.[7]

Amendment 14 also recognizes many of the benefits that would result from the recovery of river herring and shad stocks, including: additional commercial and recreational fishing opportunities, an expanded forage base for important species like striped bass, and the preservation of cultural heritage, non-market existence value and subsistence fishing for Native American communities.[8] Improved federal management could help realize these benefits through a combination of improved stock assessments, more precise reference points, a better understanding of the relative contribution of various factors for decline of river herring and shad, reduced incidental catch, precisely tailored annual catch limits (ACLs) and accountability measures (AMs), and enabling the protection of essential fish habitat.

River Herring and Shad Must Be Designated as Stocks in the Fishery

The Magnuson-Stevens Act requires that FMPs include all "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

[4] MID-ATLANTIC FISHERIES MANAGEMENT COUNCIL, Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) (April 2012) (Amendment 14), at 213.
[5] *Id.*, at 222.
[6] *Id.*
[7] *Id.*, at 189.
[8] *Id.*, at 442-43.

promote the long-term health and stability of the fishery."[9] As described above, the significant decline in river herring and shad populations, coupled with the lack of management for unregulated incidental catch in the ocean-intercept fishery, demonstrates that federal conservation and management is both necessary and appropriate. The specific management measures required of all stocks in the fishery (e.g., annual catch limits, accountability measures, and essential fish habitat designation) are essential to the conservation of these species, including by improving fishing mortality accountability, improved monitoring and data collection, and additional resources for stock assessments and habitat protections. These are all necessary ingredients of an adequate management regime for these species, without which it is likely that the populations will remain severely depleted and at risk of further decline.

All FMPs and plan amendments must be consistent with the 10 National Standards established in the MSA.[10] National Standard 1 requires that all FMPs must "prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery…"[11] The overfishing limit, defined under the National Standard 1 Guidelines as "a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis," is the upper limit on fishing mortality permitted.[12] Optimum yield is a reduction in fishing level from MSY to account for "any relevant economic, social, or ecological factor."[13] Fishing mortality, especially from the unregulated incidental ocean catch, may be resulting in the overfishing of river herring and shad and preventing the achievement of optimum yield. Failure to manage this important source of mortality for these species ignores the Council's obligation to account for relevant economic, social, and ecological factors in maintaining optimum yield for the fishery. The closure of most commercial and recreational river herring and shad fisheries up and down the East Coast has had significant adverse economic and social impacts. The decline of river herring and shad populations continues to have a variety of ecological impacts for other important fish species dependent on these species as forage. Taken together, the lack of Federal management of these species prevents fishery managers from maintaining optimum yield from each fishery and fails to prevent the overfishing of river herring and shad.

National Standard 2 requires that "conservation and management measures shall be based upon the best scientific information available."[14] The current DEIS for Amendment 14 was prepared before the results of the latest river herring stock assessment were released, and thus fail to consider this new scientific information in evaluating the various alternative actions, including whether river herring must be managed as stocks in the fishery. Section 6.2.5 mentions the 2012 river herring assessment, but does not include an analysis of the status of the stock based on that assessment. Although the stock assessment could not provide precise biological reference points on a coast-wide basis for each species of river herring, and thus was

[9] 16 U.S.C. § 1853(a)(1)(A).
[10] 16 U.S.C. § 1851(a).
[11] 16 U.S.C. § 1851(a)(1).
[12] 50 C.F.R. § 600.310(e)(2)(i)(B), (D).
[13] 50 C.F.R. § 600.310(e)(3)(i)(A).
[14] 16 U.S.C. § 1851(a)(2).

unable to determine whether the species are currently overfished or subject to overfishing on a coastwide basis, the assessment was able to determine that 23 of 24 assessed river herring populations are depleted. In addition, at least ten river herring stocks have been specifically determined to be "overfished."[15] The 2012 river herring assessment also concluded that "management actions to reduce total mortality are needed...includ[ing] reductions in directed commercial or recreational fishery mortalities, reductions in total incidental catch (retained and discarded fish)…"[16] Failure to consider this vital information, available at the time the DEIS was made available for public comment and review by the MAFMC in preparation of its decision on Amendment 14 at the June Council meeting, would violate the MSA, Administrative Procedure Act, and the National Environmental Policy Act.

National Standard 3 requires that "…interrelated stocks of fish shall be managed as a unit or in close coordination."[17] The MSA also requires that each Council prepare and submit to NMFS an FMP and any amendments that may become necessary "for each fishery under its authority that requires conservation and management."[18] According to a recent court decision on Amendment 4 to the New England Atlantic Herring FMP, "[t]hat 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."[19] Consideration for determining whether stocks can be treated as a unit for purposes of conservation and management are based on geographical, scientific, technical, recreational, and economic characteristics.[20] River herring and shad are caught in the same geographical location using the same fishing gear as stocks in the MSB fishery. They are also interrelated scientifically, as their ecological niches overlap with MSB species. For example, both river herring and mackerel serve as prey for striped bass populations, meaning that a precipitous decline in one population can have deleterious and unpredictable effects on the other. River herring and shad have also supported an important recreational fishery up and down the Atlantic coast that is directly affected by the currently unregulated incidental catch of these species in the MSB fishery. Accordingly, river herring and shad should be managed within the MSB fishery management unit.

National Standard 8 requires that conservation and management measures take into account the importance of fishery resources to fishing communities, provide for the sustained participation of such communities, and, to the extent practicable, minimize adverse economic

[15] *See* ASMFC, *Stock Assessment Report No. 12-02, River Herring Benchmark Stock Assessment, Volume II* (May 2012), at 412 (finding 9 of 15 river herring stocks in Maryland and the Upper Chesapeake Bay to be "overfished"); *id.*, at 549-550 (stating that the Chowan River blueback herring population "remains overfished" and is "less than 5% of the amount necessary to replace itself in the complete absence of fishing.").

[16] ASFMC, Stock Assessment Report No. 12-02, *River Herring Benchmark Stock Assessment, Volume I*, *Section C, River Herring Stock Assessment Report for Peer Review," at* 58 (May 2012).

[17] 16 U.S.C. § 1851(a)(3). NMFS's National Standard 3 Guidelines provide that stocks should be chosen to be managed as a unit (*i.e.*, as "stocks in the fishery") based on biological, geographic, economic, technical, social, and ecological factors. 50 C.F.R. § 600.320(d)(1)(i)-(vi).

[18] 16 U.S.C. § 1852(h)(1).

[19] *Flaherty v. Bryson*, 1:11-cv-00660-GK at 30 (D.D.C. 03/09/12) (*citing* 16 U.S.C. §§ 1802(13)(a), 1852(h)(1)).

[20] 16 U.S.C. § 1802(13)

impacts on such communities.[21] The DEIS for Amendment 14 includes a description of the biology of river herring and shad in Section 6.2, but related description of the socio-economic background of the directed river herring and shad fisheries are absent from Section 6.7, which includes such information for mackerel, squid, and butterfish. Failure to account for, and minimize to the extent practicable, the social and economic impacts of actions being considered under Amendment 14 on the historically-important river herring and shad fisheries, many of which have been closed due to stock depletion, would violate National Standard 8.

National Standard 9 requires that conservation and management measures minimize bycatch and bycatch mortality "to the extent practicable."[22] According to the DEIS, practicability rests on whether "a reduction in bycatch mortality would increase the overall net benefit of that fishery to the Nation through alternative uses of the bycatch species."[23] Based on this interpretation, the Council should analyze the relative value of the incidental catch of river herring in shad in the MSB fishery (e.g., the cost of reductions in mackerel and squid catch necessary for different reductions in river herring and shad incidental catch) and the alternative value and opportunity cost of those fish to inland directed fisheries and as prey for other important fisheries. The DEIS currently lacks this information and fails to conduct any kind of bycatch practicability analysis, as required by National Standard 9. The DEIS claims that "[b]ecause information on how much RH/S catch might be sustainable is lacking, it is not currently possible to quantify the impact on RH/S stocks of any catch reductions that may occur…"[24] While it is true that further analysis will be required to determine precisely what level of fishing mortality is adequate to prevent overfishing, rebuild the stock, and ensure sustainability of the resource, this need not prevent the Council from evaluating the relative value of river herring and shad as incidental catch in the ocean-intercept fishery, as catch in the directed inland fisheries and as forage in the ecosystem. Well established scientific modeling methods, such as "Ecopath" and "Ecosim," exist for quantifying the value of forage fish both as an economic commodity and as ecological support for other species in the ecosystem, as were recently used in the April 2012 Lenfest Forage Fish Task Force Report.[25]

The MSA explicitly requires, "within each Council's geographical area of authority," that NMFS "identify those fisheries that are overfished or are approaching a condition of being overfished."[26] For any species determined to be overfished or approaching an overfished condition, NMFS is required to establish an FMP, plan amendment, or proposed regulations.[27] As stated above, the most recent stock assessment for river herring, which was published after the current DEIS for Amendment 14 appears to have been drafted, lists 23 populations as

[21] 16 U.S.C. § 1851(a)(8).
[22] 16 U.S.C. § 1851(a)(9).
[23] Amendment 14, at 112 (quoting National Marine Fisheries Service, "*What is Bycatch,*" *available at* http://www.nmfs.noaa.gov/by_catch/bycatch_whatis.htm).
[24] Amendment 14, at 477.
[25] LENFEST FORAGE FISH TASKFORCE, *Managing a Crucial Link in Ocean Food Webs* (April 2012), *available at* http://www.oceanconservationscience.org/foragefish/files/Little%20Fish,%20Big%20Impact.pdf.
[26] 16 U.S.C. § 1854(e)(1).
[27] 16 U.S.C. § 1854(e)(3).

"depleted."[28] The most recent shad assessment found "that stocks were at all-time lows and did not appear to be recovering to acceptable levels."[29] The ASFMC lists both river herring and shad as "depleted on a coast-wide basis."[30] Although there are many factors contributing to the depleted status of these stocks, fishing mortality, especially from the unregulated ocean-intercept fishery, remains a significant factor preventing these species from recovering. As the Advisory Report from the latest river herring stock assessment explains: "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)…"[31] The prospects for the recovery of river herring and shad are dependent on controlling fishing mortality. NMFS and the Council have a statutory obligation to identify to what extent river herring and shad are overfished or approaching an overfished condition and to enact conservation and management measures that are necessary and appropriate to prevent overfishing, rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery.[32]

The DEIS states that the Council must answer two key questions in determining whether to add river herring and shad as stocks in the fishery:

1. Is the current management framework is sufficient to conserve river herring and shad stocks?
2. Can federal management by the Council improve management of river herring and shad enough to justify the management cost burden?

On the first question, there is abundant evidence that the current management framework is insufficient. The stocks are at all-time low population levels that are no longer capable of supporting historically important inland fisheries, resulting in consideration of the two river herring species for ESA listing, yet one of the largest sources of mortality of these stocks remains completely unregulated. We respectfully disagree that "the Council could achieve much of what it would do for [river herring and shad] informally outside of federal FMP management."[33] As the Council makes clear in its discussion of the benefits of managing river herring and shad as stocks in the fishery, choosing not to manage these stocks would mean less support for improving stock assessments, less precise reference points, a weaker understanding of the reasons for the stocks' declines, a lack of ACLs and AMs, no requirement to end and prevent overfishing, to attain optimum yield, or to develop rebuilding plans, and weaker measures to identify and protect essential fish habitat.

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[28] ATLANTIC STATES MARINE FISHERIES COMMISSION (ASMFC), *River Herring Stock Assessment Overview* (May 2012).
[29] A14, at 213.
[30] ASFMC, *Overview of Stock Status of River Herring and Shad*, *available at* http://www.asmfc.org/speciesDocuments/shad/shad_RiverHerring_StockStatus.pdf.
[31] ASFMC, Stock Assessment Report No. 12-02, *River Herring Benchmark Stock Assessment, Volume I*, *Section A, River Herring Stock Assessment Report for Peer Review," at* 25 (May 2012).
[32] 16 U.S.C. §§ 1854(e)(1), (e)(3); 1853(a)(1)(A).
[33] Amendment 14, at 447.

Regarding the second question, if there were no clear benefits of including river herring and shad in federal management and the costs prohibitively high, then it clearly would not make sense to move forward with this action. But, this is far from the case here. There is an urgent and legally-mandated need to reduce currently unmanaged ocean fishing mortality of these species and the incremental administrative cost increases that come with additional management responsibility are not prohibitive. The type of cost-benefit analysis proposed by the Council is the wrong metric here, as the MSA does not impose a cost-benefit analysis for determining what conservation measures are required to end overfishing, rebuild overfished populations, and protect, restore, and promote the long-term health and stability of the fishery.[34] In addition, the socio-economic costs to historically-important inland river herring and shad fisheries, and other fisheries that depend on these species for forage have not been fully accounted for in the DEIS.

Adopt Mortality Caps for River Herring and Shad

We recommend that the Council immediately implement mortality caps for river herring and shad in the Atlantic mackerel fishery **(Actions 6b-6c)**. We also recommend that such a cap be implemented jointly with the Atlantic herring fishery under the management of the NEFMC. Both the DEIS and the FMAT Report explain why adopting a mortality cap in only one of these fisheries would not accomplish the goals of effectively reducing bycatch of river herring and shad because of the close association of the Atlantic mackerel and herring fisheries.[35] On a procedural level, we also recommend that the setting of mortality caps be permitted to be done as a framework action rather than a full FMP amendment **(Action 6f)**.

Expand Observer Coverage and Other Monitoring and Reporting Requirements

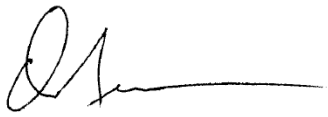
We urge the Council to adopt 100 percent at-sea monitoring on all mid-water trawl fishing trips **(Action 5b4)** and require at least one observer to each vessel in a pair trawl operation **(Action 3d)**. To maximize the efficacy of expanded observer coverage, all catch must be made available to fishery observers for systematic sampling **(Action 3j)**. A fleet-wide limit of 10 dumping events should be established **(Actions 3l and 3n)** and vessels that dump should be required to take an observer on their next trip **(Alternative 3o)**. We recommend that dealers be required to weigh all catch **(Actions 2c-2f)** and to obtain vessel representative confirmation of landings **(Action 2b)**. Finally, to improve data collection, mackerel and longfin squid vessels should be required to submit weekly vessel trip reports **(Action 1c)** and daily VMS reports **(Actions 1fMack, 1fLong, 1eMack, and 1eLong)**.

[34] Courts have concluded that "the purpose of the Act is clearly to give conservation of fisheries priority over short-term economic interests." *NRDC v. NMFS*, 421 F.3d 872, 879 (9th Cir. 2005) (explaining that "the Act sets this priority in part because the longer-term economic interests of fishing communities are aligned with the conservation goals set forth in the Act."); *see also NRDC v. Daley*, 209 F.3d 747, 753 (D.C. Cir. 2000) (finding that NOAA "must give priority to conservation measures").

[35] Amendment 14, 374; FMAT Report, at 640.

Thank you for the opportunity to comment on this important matter and for your consideration of our recommendations.

Very Truly Yours,



David Newman, Oceans Program Attorney
Brad Sewell, Senior Attorney
Natural Resources Defense Council
40 West 20th Street, 11th Floor
New York, NY 10011
212-727-4557
dnewman@nrdc.org

cc: MAFMC Members
Daniel Morris, Acting Regional Administrator, NMFS NERO

THE PEW ENVIRONMENT GROUP

June 4, 2012

Dr. Christopher Moore
Mid-Atlantic Fishery Management Council
800 N. State Street
Suite 201
Dover, DE 19901

Mr. Daniel Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2298

RE: AMENDMENT 14

Dear Dr. Moore:

The Pew Environment Group has collected an additional **9,804** comments in response to the Draft Environmental Impact Statement for Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan. Specifically, these comments ask the Council to:

- **Include river herring and shad as stocks within the fishery. (Alternative 9b-9e).**
- Implement he 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.
- 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 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).**

I have attached a list with the name, city and state of each person who signed the attached letter.

Thank you,

Theresa Labriola,
Senior Associate, Northeast Fisheries Program
Pew Environment Group

June 4, 2012

Dr. Christopher Moore
Mid-Atlantic Fishery Management Council
800 N. State Street
Suite 201
Dover, DE 19901

Mr. Daniel Morris
Acting Regional Administrator
Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2298

RE: AMENDMENT 14
ADVANCE PROTECTIONS FOR RIVER HERRING AND SHAD AT SEA

Dear Dr. Moore:

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).

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.

Last Name	First Name	Address	City	State
Portuguez koch	Luciane	1063183 street	Edmonton	AB
Tran	Danielle	191 Edenwold Dr NW	Calgary	AB
Boettcher	Barbara	2209-32 Street S.W.	Calgary	AB
Kroeker	D'Arcy	818 22 Ave SE	Calgary	AB
Martel	Nathalie	new brighton garden	calgary	AB
parish	stephanie	PSC 37 Box 2191	APO	AE
Gibb	Kenneth	11160 Vosikof Pl	Anchorage	AK
Mortenson	Dan	1180 Park Ave # 2	Ketchikan	AK
Casey	Larry	12428 Winter Park Cir	Eagle River	AK
Smith	Lacey	1331 Jones Rd	Fairbanks	AK
Brown	Tina	19400 Beardsley Way	Juneau	AK
Strong	Lynnda	2309 Halibut Point Rd Spc 34	Sitka	AK
Sherwonit	Bill	2441 Tulik Dr	Anchorage	AK
Mcconkey	Kimberly	2610 E 42nd Ave Apt 1	Anchorage	AK
Vogt	Susan	269 Bias Dr	Fairbanks	AK
Tack	Stephen	304 Noyes St	Fairbanks	AK
Lewis	Courtney	3100 Norm Cir	Anchorage	AK
Zaleski	Adam	3335 Tongass Blvd	Juneau	AK
Peloza	Amy	4431 Edinburgh Dr	Anchorage	AK
prem	parinito	5100 Fairchild Ave	Fairbanks	AK
Warwick	April	5716 Kennyhill Dr	Anchorage	AK
Russell	Christopher	593 A oldsteese hwy N.	Fairbanks	AK
Inglima	Laura	60210 Bear Creek Dr	Homer	AK
O'Donnell	Shawn	7539 Eastbrook Cir	Anchorage	AK
Goodrich	Rebecca	905 Richardson Vista Rd Apt 90	Anchorage	AK
Thompson	Renae	9731 Vanguard Dr	Anchorage	AK
Ignjatovic	Andrej	Deligradska	Belgrade	AK
Gšttert	Roland	Main St.	Adak	AK
Wittshirk	Rudy	mile 11.5 Hatcher Pass Rd.	Willow	AK
Savonen	Lynn	mountainview hwy	Gustavus	AK
Maisonlahti	Tuula	Myllykuja 3 as 2	Hauho	AK
Keiser	Peter	North Douglas I.	Juneau	AK
Harney	Eileen	P.O. Box 0199	Fairbanks	AK
Schwarz	Sibylle	P.O.Box: 6099	Eagle River, Alaska	AK
Slater	Leslie	PO Box 2316	Homer	AK
Small	Gretchen	PO Box 6197	Sitka	AK
Alexakos	Irene	PO Box 727	Haines	AK
ribeiro	elisabete	rua conego rafael alvares costa 43	BRAGA	AK
ozkan	dogan	zambak sok. no:8/10 ciftci apt.	istanbul turkey	AK
Byrd	Becky	1005 Windsor Ave	Gardendale	AL
Bryant	Judith	1039 County Road 520	Hanceville	AL
coggins	wayne	1059 Tutwiler Ct	Anniston	AL

Didden, Jason T.

From: MSB Amendment14 <msbamendment14@noaa.gov>
Sent: Tuesday, June 05, 2012 2:32 PM
To: Didden, Jason T.
Subject: Fwd: Protect Threatened River Herring and Shad

---------- Forwarded message ----------
From: **Melissa Rothenberger** <melissakate77@sbcglobal.net>
Date: Mon, Jun 4, 2012 at 11:47 PM
Subject: Protect Threatened River Herring and Shad
To: msbamendment14@noaa.gov

Jun 4, 2012

Amendment 14 Comments

Dear Comments,

For years, New York and other coastal states and communities along the Atlantic coast have worked tirelessly to restore culturally and economically significant species such as river herring and shad to rivers along the 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 coast-wide by 99 and 97 percent, respectively. In New York the Hudson River's historic shad fishery was recently closed to protect dwindling populations and a similar fate for river herring is likely. In addition, many other 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).

**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.

Sincerely,

Ms. Melissa Rothenberger
PO Box 536
Brewster, NY 10509-0536
(845) 279-2995

Didden, Jason T.

From: MSB Amendment14 <msbamendment14@noaa.gov>
Sent: Tuesday, June 05, 2012 2:35 PM
To: Didden, Jason T.
Subject: Fwd: Amendment 14 Comments

---------- Forwarded message ----------
From: **Anna Minore** <miriam3141@hotmail.com>
Date: Wed, May 30, 2012 at 6:36 PM
Subject: Amendment 14 Comments
To: MSBAmendment14@noaa.gov

May 30, 2012

Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901

Dear Mid-Atlantic Fishery Management Council,

River herring and shad populations are at historic lows.

In light of the depleted status of these fish, 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 designating river herring and shad as stocks in the fishery will take time. Therefore, the Council should also 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)

In addition, I strongly urge you to incorporate 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).

I like eating fish...and the big fish that I like to eat depend on the over-all health of the water eco-system. I bet that your grandchildren would like eating fish also. Maybe we should save some for them, eh?

Sincerely,

Anna Minore
32 Holiday Dr Apt 130
Kingston, PA 18704-5343

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

June 4, 2012

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 N. State St
Dover, DE 19901
MSBAmendment14@noaa.gov

RE: Comments on Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan and Draft EIS (No. 20120106)

Dear Dr. Moore:

We are writing on behalf of the Herring Alliance[1] to urge the Mid-Atlantic Council to approve final management measures for inclusion in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP) that immediately begin to recover and rebuild river herring and shad populations. The existing fragmented management approach for these species has left river herring and shad with no meaningful regulation in federal waters where they are caught in the MSB fishery, with inadequate catch monitoring, no measures to minimize incidental catch, and no catch limits. This has contributed to the severely depleted status of these keystone species and left them in dire need of conservation and management.[2] The National Marine Fisheries Service is legally obligated to conserve and manage these depleted stocks in federal waters, and the Mid-Atlantic Council should assume leadership in shaping this management by selecting approving the following management measures:

- Add river herring and shad as non-target stocks in the fishery. **Alternative Set 9b-9e.**
- 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 in the fishery is developed and implemented:

    - Implement mortality caps for river herring and shads (alosines) in the mackerel fishery. Modify the proposed caps to reduce the incidental mackerel catch allowable

[1] The Herring Alliance includes 52 organizations representing nearly 2 million individuals. The Herring Alliance is concerned about the status of 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 Herring Alliance members is attached to this letter. *See* membership at: www.herringalliance.org/alliance-members.

[2] For example, the 2012 river herring stock assessment and peer review conclude that river herring are depleted, that ocean catch is an issue, and that they require fisheries management. 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/.

to 2000 pounds per trip once the cap is exceeded and directed fishing for mackerel stops. **Combined and Modified Alternatives 6b and 6c, and** Add mortality caps to the list of frameworkable measures. **Alternative 6f.**

- Close river herring hotspots to directed squid and mackerel fishing. Close the "River Herring Protection Areas" identified by the NEFMC in Amendment 5 to the Atlantic Herring FMP. **Modified Alternative 8eMack and Alternative 8eLong**. Also create a mechanism under which the larger "River Herring Monitoring/Avoidance Areas" identified in Amendment 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 Mid-water trawl vessels in the Mackerel fishery, in order to improve precision and accuracy in incidental catch estimates. **Alternatives 1c, Modified Alternative 1d48, Alternatives 1eMack & 1eLong, Modified Alternative1fMack, Alternatives 1gMack & 1gLong; Modified Alternatives 2b, 2c, &2d, Alternatives 2e &2f; Alternatives 3b & 3c, Modified Alternative 3d, Modified Alternative 3j, Alternatives 3l, 3n, & 3o; Modified Alternative 5b4, Modified Alternatives 5c1 & 5c4, Modified Alternative 5d2, Modified Alternatives 5f, Alternative 5g, and Modified Alternative 5h.**
- Include flexible management options, either through the specifications process or through a framework option, to easily adapt management in the future.

Detailed comments are provided below. Where alternatives have been modified, 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

1. The Council Must Add River Herring and Shad to the MSB FMP

2.1.9 Alternative Set 9 – Addition of RH/S as "Stocks in the Fishery" in the MSB FMP

The Herring Alliance strongly supports the suite of options in Alternative Set 9b-9e that add all four (4) species of river herring and shad (RH/S) to the MSB FMP and launch an amendment process to add the additional measures necessary to fully integrate blueback herring, alewife, American shad, and hickory shad as stocks in the fishery in the MSB 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.[3] FMPs must contain conservation and management measures consistent with the National Standards, including National Standards One and Nine which requires management measures that prevent overfishing and minimize bycatch.[4] The Act also requires annual catch limits (ACLs) and accountability measures (AMs) for *all* stocks in the fishery.[5] The National Standard 1 Guidelines require councils to identify the stocks in the fishery, including the non-targeted stocks that are caught incidentally and retained or discarded at sea.[6] Identification as a stock in the fishery triggers federal annual catch limit (ACL) requirements and the standard

[3] 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 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.

[4] 16 U.S.C. § 1851(a)(1) & (9).

[5] *Id.* § 1853(a)(15).

[6] 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).

approach to setting ACLs contained in the National Standard 1 Guidelines.[7] NMFS must review council decisions to ensure that they comply with the Act, and disapprove those that do not. 16 U.S.C. § 1854(a).

The question of which stocks must be included in a fishery management plan was recently addressed in federal court. *See Flaherty v. Bryson*, 2012 WL 752323 at *13 (D.D.C. Mar. 8, 2012) (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.

There is no question that river herring and shad are involved in the mackerel and herring fisheries and are capable of being managed as part of the MSB FMP. *See Flaherty*, 2012 WL at * 12 ("Defendants' conclusory statement that river herring would simply have to wait until a future amendment does not suffice."). First, it is undisputed that river herring and shads are in the Atlantic mackerel fishery because they are caught, kept, landed, and sold in it as well as discarded as bycatch.[8] It is **e**stimated that the mid-water trawl fishery for Atlantic herring and Atlantic mackerel accounts for 71% of the combined incidental catch of river herring and shads; fleet overlap between the small-mesh bottom trawl fisheries account for another approximately 24% of the combined incidental catch.[9] 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.[10] Because they are involved in this fishery, considering and implementing solutions to the problems of incidental catch in ocean intercept fisheries was the purpose of Amendment 4 and cannot be ignored.[11]

River herring are in dire need of conservation and management. In addition to the science identified in the DEIS that shows that river herring are in need of conservation and management,[12] new information makes conservation and management of these species even more critical. The new benchmark stock assessment for river herring, approved for management

[7] *See* 50 C.F.R. § 600.310(a), (b)(ii).
[8] *See* Amendment 14 DEIS, Incidental Catch Analysis, at pp. 569-582.
[9] *See* Amendment 14 DEIS, Appendix 2, p. 581.
[10] 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.
[11] *See* Amendment 14 DEIS, Executive Summary at 9.
[12] *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.

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.[13] Of 24 river stocks for which the stock assessment team was able to characterize current condition, 92% were described as depleted.[14] According to the assessment report "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."[15] U.S. commercial landings today are down 93% from the 1970's.[16] 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."[17] It "…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…"[18] 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. [19]

In addition to the benchmark 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.[20] Finding that NRDC's petition presented "substantial scientific information indicating the petitioned action may be warranted" NMFS initiated a year-long status review. As described in the petition, existing state and federal regulatory mechanisms have proven to be insufficient for river herring. [21] This is due in large part because of the federal/state/regional management framework with shared responsibilities for these migratory fish that has avoided the type of coordinated management necessary to conserve and manage the species. For example, in state waters river herring are managed by the Atlantic States Marine Fisheries Commission ("ASMFC") under Amendment 2 to the Interstate Fishery Management Plan for Shad and River Herring ("Amendment 2"). Regulatory measures drafted by the ASMFC, and implemented through state laws, have proven insufficient in significant part because this interstate compact agency and Amendment 2 have confined the reach of their management plan to state waters only. Although Amendment 2 was drafted in response to dramatic declines in the abundance of river herring, it contains no measures necessary to adequately monitor, limit, and reduce the incidental catch of river herring in federal waters where millions are caught every year by mid-water trawlers targeting Atlantic herring and Atlantic mackerel. Currently, states without an approved Sustainable Fisheries Plan must close their commercial and recreational fisheries; however, state moratoriums on directed fisheries for river herring have been in place for several years in a

[13] *See* The ASMFC's River Herring Stock Assessment Report No. 12-02, Volume I – Coastwide (May 2012) ("Stock Assessment Report").
[14] Stock Assessment Report - Executive Summary.
[15] Stock Assessment Report - Executive Summary.
[16] Stock Assessment Report - Executive Summary.
[17] *Terms of Reference & Advisory Report of the River Herring Stock Assessment Peer Review* (March 2012)("Peer Review Report"), Introduction at p. 8.
[18] *Id.* at p. 8.
[19] *Id.*
[20] 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).
[21] NRDC Petition at 78-79.

number of critical states without sufficiently beneficial results.[22] Although the ASMFC is required to coordinate its management measures with NMFS, acting through NMFS to promote the conservation of stocks throughout their ranges, this authority has not been exercised.

Shads are involved in the fishery and in need of conservation and management. Figures used the Mid-Atlantic Council to develop Amendment 14 indicate that on average 120,000 pounds of shad were caught in ocean intercept fisheries from 2006-2010.[23] Of the approximately 600,000 fish, many of them were juveniles that had not spawned.[24] Shads are managed under Amendment 3 to the Interstate Fishery Management Plan for Shad and River herring and, similar to river herring, the ASMFC lists the status of American shad as depleted in accordance with its most recent stock assessment.[25] Despite efforts in state waters, the 2007 stock assessment found that "stocks were at all-time lows and did not appear to be recovering to acceptable levels."[26] 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.[27] No assessments are available for Hickory Shad but as noted in the DEIS, "many runs are likely below historical levels for reasons similar to those discussed below for Atlantic Shad."[28]

With a "stock in the fishery" designation under Alternative Set 9b-9e, the Mid-Atlantic Council would take immediate action to implement incidental catch limits for river herring and shad in the directed fishery for Atlantic mackerel (and Atlantic herring) based on the best available science about what catch level is sustainable and in line with restoration goals. At a minimum, the species meet the definition of non-target stocks because they are caught incidentally in the pursuit of Atlantic mackerel (and Atlantic herring). The trailing amendment, triggered by the choice of Alternative Set 9b-9e, would further develop the required ACLs and other management measures required by law. As the DEIS notes, the law provides for some flexibility in meeting the National Standard 1 requirements and could allow the Mid-Atlantic Council to seek assistance in meeting its legal obligations from the Atlantic States Marine Fisheries Commission.[29] However, as the DEIS makes clear (*see* §§ 6.2.5 and 6.2.6 summary of stock status), the existing federal/state/regional management framework is insufficient to adequately conserve RH/S stocks - the no action Alternative 9a is unacceptable. The designation of these four species as stocks in the fishery is the foundational decision triggering determination of status determination criteria, establishment of ACLs, and

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[22] 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) that met the July 1, 2011 deadline.

[23] *See* Amendment 14 DEIS, §4.1.B at p. 111.

[24] *Id.*

[25] 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.

[26] *See* Amendment 14 DEIS, §6.2.6 at p. 213.

[27] *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. Conducted July 16-20, 2007, Alexandria, Virginia.

[28] Amendment 14 DEIS, s. 6.2.6 at p. 213.

[29] *See* March 18, 2011 Letter submitted by Earthjustice on behalf of the Herring Alliance to Dr. Malcolm Rhodes, Chairman of the ASMFC Shad and River Herring Board.

identification of essential fish habitat, in addition to development of the other required measures necessary to make this FMP comply with the law.[30]

2. Industry's Argument Regarding Stock in the Fishery Designation Is Incorrect

Industry, in their comments on Alternative Set 9, attempts to inject an entirely new (and misguided) legal theory into the discussion of whether river herring and shad should be added as stocks in the fishery of the MSB FMP. *See* June 4, 2012, Letter from Lund's Fisheries Incorporated to Executive Director MAFMC re Amendment 14, at p. 8. In its letter, industry claims that "stock determination criteria" are a "necessary condition for a Council to establish 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.[31] The Act also requires any plan to specify "objective and measurable criteria for identifying when the fishery to which the plan applies is overfished . . .."[32] The National Standard One Guidelines reinforce this analysis and require stocks involved in the fishery be identified, so they can be added to an FMP, and status determination criteria can be used to prevent overfishing. *See* 50 C.F.R. §§ 600.310 (d)(1) (an FMP must contain a "description of species of fish involved in the fishery"), (d)(4) ("Non-target species may be included in a fishery and, if so, they should be identified at the stock level"), and (e)(2)("status determination criteria (SDC) mean the quantifiable factors, MFMT, OFL, and MSST, or their proxies, that are used to determine if overfishing has occurred, or if the stock complex is overfished."). 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.

Alternative Set 9b-9e identifies a two-step process that will make the designation of river herring and shad consistent with the requirements of the Magnuson-Stevens Act stating:

> 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.

Amendment 14 DEIS, § 5.9.3 at 194. Prior to publication of these alternatives, NMFS determined that an EIS was the appropriate level of NEPA review for this proposed federal

[30] In addition, the Council should consider any other measures necessary to reduce bycatch, as required by National Standard 9. *See* 16 U.S.C. § 1851(a)(9).
[31] *See* 16 U.S.C. §§ 1852(h)(1), 1853(a)(2); *see also Flaherty v. Bryson*, 2012 WL 752323 at * 11, 12.
[32] *Id.* at § 1853(a)(10).

action, 74 Fed. Reg. 68577 (Dec. 28, 2009), and approved this DEIS, NOAA Award No. NA10NMF4410009.

"Need" does not equate to a prerequisite. Although no citation was provided, the preamble to the final rule the 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). No one disputes that stocks ultimately "need" these criteria to prevent overfishing; however, nothing in the Act, the Final Rule, or the regulations interpreting National Standard One contemplates the necessity of status determination criteria prior to adding a stock in the fishery. On the contrary, the regulations contemplate the order discussed above and even 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}.[33] A plain reading of the regulation does not support industry's distorted view.

Finally, the ASMFC's river herring stock assessment has now been peer-reviewed and approved by the ASMFC Shad & River Herring Management Board for management use and it cannot be used as an excuse not to manage these species. Under the scenario outlined in Alternative set 9b-9e, the Council has 1-2 years to complete the trailing amendment and identify the SDC. Moreover, if necessary, the Mid-Atlantic Council could use proxies for those values as it has used in other managed species.[34] This stock assessment report represents best available science and while it did not provide reference points for the coastwide river herring complex, it provided ample evidence that river herring and shad are in need of conservation and management, and thus should be added to a plan.

3. Until River Herring and Shad are Fully Integrated into the FMP the Council Must Establish a River Herring and Shad Catch Cap

2.1.6 Alternative Set 6: Mortality Caps

The Herring Alliance strongly supports interim measures that:

- **Combine and modify Alternatives 6b and 6c to implement a single mortality cap for all river herring and shad species (alosines) in the mackerel fishery (closing the mackerel fishery when the cap is exceeded), and modifying the incidental catch allowance of Atlantic mackerel after the fishery is closed to 2,000 pounds.**
- **Implement Alternative 6f to allow mortality caps to be added to the list of measures that can be frameworked.**

The addition of river herring and shad as stocks in the MSB fishery through Amendment 14 will not sufficiently reduce incidental catch while the Mid-Atlantic Council develops a trailing amendment that fully integrates them into the MSB FMP; therefore, the Herring Alliance supports a mortality cap that immediately reduces and limits the at-sea mortality of these depleted species. This interim catch cap should be effective in 2013, and remain in effect until

[33] *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, ...").
[34] *See* May 3, 2011 Staff Memorandum regarding 2012 Atlantic Mackerel, *Illex*, *Loligo*, and Butterfish OFL/ABC Recommendations; *see also* May 23, 2012, SSC recommendations setting OFL proxy for butterfish.

replaced by ACLs or similar conservation measures under the MSB FMP once the river herring and shads are fully integrated in the FMP.

A combination and modification of Alternatives 6b and 6c could function as a single mortality cap in the mackerel fishery as more precise estimates of incidental catch are obtained with increased observer coverage and more robust sampling. Currently, the overlap of the Atlantic mackerel and Atlantic herring mid-water trawl fishery complicates the implementation of a mortality cap on the mackerel fishery alone because if the mortality cap operated to shut the Atlantic mackerel fishery down, Atlantic herring fishing could continue in the same Quarter and same Area allowing incidental catch of river herring and shad to continue. Further, the current mackerel incidental allowance of 20,000 pounds proposed under 6b and 6c is far too liberal to deter directed fishing and minimize fishing effort should a mortality cap on RH/S be reached. **This alternative set, and others below, 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-ACLs.**[35] The 2,000 pound incidental Atlantic herring limit, implemented after a herring management area closes to enforce sub-ACLs, has proven effective. For example, when the Atlantic herring Area 2 closed on February 20th of this year, mackerel fishing taking place in the same area leveled off.[36] Thus, a combined and modified cap would improve the effectiveness of the cap and ensure that vessels cannot circumvent a cap by simply declaring into another fishery. The modification from the current incidental allowance of 20,000 pounds of mackerel to 2,000 pounds would more effectively ensure that once the cap is reached 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. **Further, the implementing language for that incidental limit should be consistent with the language in the Atlantic Herring FMP such that the 2,000 pound incidental limit would apply to vessels "fishing for, catching, possessing, transferring, or landing more than 2,000 lb."**[37]

Alternative 6f adds mortality caps to the list of frameworkable measures and is appropriate in order to allow for a catch cap on the squid or butterfish fisheries (should a directed butterfish fishery become higher than the current level) as data improves through catch monitoring and sampling and as the need arises. Currently the MSB FMP does not list incidental catch caps as frameworkable measures, and this alternative would facilitate implementation should new data reveal a more significant alosine catch in any of the target fisheries.

Note: The Council Can Not Rely on a Voluntary Bycatch Avoidance Program such as the SFC/SMAST/DMF Project described in Alternative 4f to Satisfy its National Standard 9

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[35] The 2,000 lb limit used to close the directed herring fishery was approved in Amendment 4 to the Atlantic 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, at p.29.

[36] *See* NERO. Weekly Quota and Landing Report available at: http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm.

[37] 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* 77 Fed. Reg. 10668 (Feb. 23, 2012).

Obligation to Minimize Bycatch. This 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. 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, and will likely disappear as soon as Amendments 14 and Amendment 5 to the Atlantic Herring FMP pass. 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. Until River Herring are Fully Integrated into the FMP the Council Must Implement Hotspot Closures

2.1.8 Alternative Set 8: Hotspot Restrictions

As interim measures the Herring Alliance supports the following alternatives:

- **Modified Alternative 8b: Make implementing the hotspot requirements of NEFMC's Amendment 5 to the Atlantic Herring Plan for Mackerel/longfin squid vessels frameworkable. Modified to provide a mechanism through which the Mid-Atlantic Council could expand the hotspots identified in Amendment 5 to encompass the larger River Herring Monitoring/Avoidance Areas, or adjust hotspot requirements to achieve consistency with the Atlantic Herring FMP through a Framework Adjustment.**
- **Modified Alternative 8eMack: Vessels possessing a federal mackerel permit would not be able to fish for, catch, possess, retain, transfer, or land[38] more than an incidental level of fish (2,000 pounds of 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[39] 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.**

As an interim measure, the Herring Alliance supports a Modified Alternative 8b, that closes the temporal and spatial protection areas identified as having high rates of river herring or shad bycatch ("hot-spots") to directed mackerel and squid fishing 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 New England Council's Herring Plan Development Team (PDT) are small, and the Mid-Atlantic Council'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

[38] Proposed revisions make this measure more consistent with the incidental catch allowance regulations in the Atlantic Herring FMP as previously described.
[39] *Id.*

the same provisions in Amendment 5, 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). As more data becomes available, through increased monitoring and reporting, the Council should expand the protection areas as necessary through a framework action and give consideration to the larger areas identified in Amendment 5 and described in Amendment 14 as "River Herring Monitoring/Avoidance Areas."[40]

For all of the reasons described in the sections on mortality caps and observer coverage, the Herring Alliance also supports a Modified 8eMack which reduces the incidental level of mackerel a federal permit would be able to fish for, catch, possess, retain, transfer or land in a River Herring Protection Area from 20,000 pounds to 2,000 pounds, and Alternative 8eLong, as modified to reduce the total catch of river herring and shad at sea. The Council should carefully monitor the effectiveness of the hotspot regime for squid vessels to determine if any similar adjustments are warranted.

5. Require 100% observer coverage for Mid-water trawl vessels in the Mackerel fishery

2.1.5 Alternative Set 5: At-Sea Observer Coverage Requirements

To achieve the stated goals of Amendment 14 and ensure the effectiveness of the other alternatives the Herring Alliance supports the following alternatives, while opposing a sunset clause for increased observer coverage levels implemented through Amendment 14 and the waiver associated with Alternative 5f and discussed on page 160:

- **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. This alternative would be modified such that 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 retain more than 2,000 pounds of mackerel.**
- **Modified Alternative 5c1: Require 25% of SMBT trips by Tier 3 limited access mackerel 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 retain more than 2,000 pounds of mackerel.**
- **Modified Alternative 5c4: Require 100% of SMBT (<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. 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 retain more than 2,000 pounds of mackerel.**

[40] *See* Amendment 14 DEIS, § 2.1.8 at pp. 72-77.

- **<u>Modified Alternative 5d2</u>: Require 50% of SMBT (<3.5 in) longfin squid trips by <u>major longfin squid moratorium permitted</u> vessels intending to retain over 2,500 pounds of longfin squid to carry observers. The NEFSC would assign coverage based on pre-trip notifications. Vessels would not be able to retain more than 2,500 pounds of longfin squid unless they had notified their intent to retain more than 2,500 pounds of longfin squid.**
- **<u>Modified Alternative 5f</u>: Vessels would have to pay for observers to meet any observer coverage goals adopted by the Council that are greater than existing sea day allocations assigned through the sea day allocation process (already implemented in other fisheries). NEFSC would accredit observers and vessels would have to contract and pay observers. <u>Modified</u> to prohibit waivers, especially without explicit limits and accountability measures to ensure that waivers do not undermine the target coverage level. <u>Modified</u> to require States receive full provider certification in order to be providers.**
- **<u>Modified Alternative 5h</u>: Requires reevaluation of coverage requirements after 2 years to determine if incidental catch rates <u>should be adjusted - up or down based on circumstances</u>.**

Monitoring an industrial fishery is a mandatory precondition of access to millions of pounds of public resources. 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 accountability measures are also vital to fulfilling National Standard One's mandate to prevent overfishing, *id.*, and National Standard Nine's requirement 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," *id.* § 1851(a)(9). These directives are critical to the effective implementation of Amendment 14 which depends upon the accurate measurement of the amounts of river herring and shad caught and discarded in this fishery[41] and if this fishery cannot be monitored adequately, it should not have access to this national public resource.

In order to achieve the stated goals of Amendment 14, and ensure the effectiveness of the recommended alternatives, it is imperative that the Mid-Atlantic Council increase observer coverage and ensure that observers have access to all catch.[42] Adequate monitoring and bycatch measures are 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."). 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

[41] By themselves vessel catch reports have been found unreliable. *See Conservation Law Foundation v. Evans*, 209 F. Supp. 2d 1 at 13, n. 25 (D.D.C. 2001) (noting unlawful underreporting of bycatch) (Kessler, J.). In addition, dealers have no possible way of knowing the amount of river herring and other species discarded at sea as bycatch because they only see and buy what is brought to their facility.

[42] *See* http://www.mafmc.org/fmp/current/SMB/River_Herring_Letters.pdf.

prioritized by the Council. 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. 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 14. In addition, these alternatives should be consistent with Amendment 5 in order to avoid discrepancies 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.

In order to properly cover mid-water trawl mackerel trips, 100% observer coverage is necessary and the Herring Alliance supports a Modified Alternative 5b4. Mid-water trawl vessels account for 75.7% of river herring incidental catch and 41.8% of shad incidental catch,[43] and are responsible for the majority of mackerel landings, accounting for 62% of landings in 2010.[44] According to information presented in Amendment 11 to the MSB FMP, there are 15 mid-water trawl vessels that are eligible for the mackerel limited access program (13 in Tier 1 and 2 in Tier 2).[45] 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, mid-water 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 mid-water trawl fisheries for Atlantic herring and Atlantic mackerel, observer coverage levels should be consistent between the FMPs.[46] Further, 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 ensure the integrity of a mortality cap, the same adjustment 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). Limiting vessels to 20,000 pounds of mackerel will not sufficiently deter directed fishing by the large MWT vessels which comprise the most significant component of the herring-mackerel fishery overlap.

In order to properly cover small-mesh bottom trawl mackerel trips, the Herring Alliance supports a hybridization of Modified Alternatives 5c1 and 5c4 with a tier approach to assigning different coverage levels to small mesh bottom trawl vessels (SMBT). Small-mesh bottom trawls are believed to contribute to 23.7% and 25.6% of river herring and shad incidental 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.[47] Neither Tier 1 nor Tier 2 vessels

[43] *See* Amendment 14 DEIS, Appendix 2 at p. 581.
[44] *See* Amendment 14 DEIS, Table 29 at p. 247.
[45] *See* MAFMC. Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (May 2011), Tables 94-96 at pp. 447-448.
[46] *See* Amendment 14 DEIS, Appendix 2 at p. 574.
[47] *Id.*

are capped by a percentage of the quota, with no trip limits for Tier 1 vessels. For Tier 3, however, 138 vessels qualify,[48] 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,[49] likely making the observer costs significantly more burdensome for vessels in Tier 3 relative to their daily operating costs. 100% 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.

The Herring Alliance supports a Modified Alternative 5d2, which calls for 50% observer coverage on the major longfin squid vessels. Currently only 3.5% of longfin squid catches by weight have been observed (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) 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] The Mid-Atlantic Council should identify these 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 year. Criteria that could be utilized to sort and assign the fleet in this manner include an analysis of recent catch 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. 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.

With respect to Modified Alternative 5f, the Herring Alliance opposes the addition of a sunset clause for any increased observer coverage levels implemented through Amendment 14. The alternatives already contemplate a future review of the observer requirements by the Council in Alternative 5h and the Service has indicated that it may take time for an expanded observer program to be designed once these fisheries are 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. The Herring Alliance also opposes the issuance of waivers (as discussed under Alternative 5f on page 160), under which a vessel or

[48] *Id.*
[49] *See* MAFMC Amendment 11 DEIS, Table 82 at p. 435.
[50] *See* Amendment 14 DEIS at p. 147.
[51] *See* MAFMC April 2012 Staff Loligo AP Informational Document, at Tables 4 and 6, available at: http://www.mafmc.org/meeting_materials/SSC/2012-05/Loligo%20APInfo-2012.pdf.

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, with a known potential for infrequent but destructive bycatch events, must have 100% coverage. 100% 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.

On the issue of review, the Herring Alliance supports a Modified Alternative 5h that requires reevaluation in 2 years to determine whether observer coverage rates should be adjusted; however, as written Alternative 5h is too restrictive and hints at foregone conclusions. The Herring Alliance supports a comprehensive analysis of whether coverage levels should be adjusted in general, including whether they need to be increased.

Note: Without maximized retention (not considered in Amendment 14) the Herring Alliance 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.

6. Additional Measures to Improve At-Sea Sampling

2.1.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures

In order to successfully reduce total catch of river herring and shad and achieve the goals of Amendment 14, it must have reliable total catch estimates. Estimates of the amount of catch are dependent upon accurate estimates because total catch is used to scale up from the amounts observed in samples. **To ensure reliable total catch estimates of river herring and shad, and achieve the goals of Amendment 14 the Herring Alliance supports the alternatives listed below:**

- **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. Modified to remove the whenever/wherever language.**
- **Modified Alternative 3j: Modified to apply "Closed Area I" (CA1) requirements to all mackerel limited access and longfin squid moratorium permitted vessels intending to fish for, catch, possess, retain, transfer, or land over 2,000 pounds of mackerel. These requirements are currently in force in the Atlantic herring fishery for mid-water 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 3l: Related to 3j, 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.**
- **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.**
- **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 (3g, 3h, 3k-3n), then the relevant vessel would have to take an observer on its next trip.**

In Alternative 3d, the language "wherever/whenever possible" should be removed. 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 should clarify that consistent with the current CA1 sampling regulations, operational discards must be brought aboard for sampling, and 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 only those circumstances. 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] The implementing language should also be revised so that the measures apply to trips "fishing for, catching, possessing, transferring, or landing" the specified amount of the target species to be consistent with the Atlantic Herring FMP.

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[52] *See* Amendment 14 DEIS, Appendix 5 at p.662.
[53] *See* NEFSC. Standardized Bycatch Reporting Methodology Annual Discard Report 201: Section 2 at p. 189, available at: 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, 75 Fed. Reg. 73979 (Nov. 30, 2010).

To minimize slippage events, the Herring Alliance supports Alternative 3l to cap the number of slippage events per year in the mackerel fishery at 10. From 2006-2010, 26% of hauls on observed mackerel trips had some unobserved catch.[55] In contrast, vessels fishing under Closed Area I (CA1) regulations in the Atlantic herring fishery had no observed slippage events recorded in 2010.[56] However, prior to the implementation of the CA1 rules, the Atlantic herring fishery had an observed slippage rate of 35%.[57] **This reduction in dumping in the herring fishery clearly demonstrates the effectiveness of the CAI rules.** 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 Mid-Atlantic Council should select final measures in Amendment 14 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 unduly penalizing those involved.

To minimize slippage events, the number of slippage events in the longfin squid fishery should also be capped at 10 events consistent with Alternative 3n and implemented in conjunction with Alternative 3j. On observed longfin squid trips, an average of 9% to 14 % of hauls are not seen and sampled by observers.[58] 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, which requires a vessel which has had its trip terminated within 24 hours because of an of the anti-slippage provisions to take an observer on its next trip, 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.

Note: The Herring Alliance is opposed to the Released Catch Affidavits as discussed in Alternative 3e because the Mid-Atlantic Council does not track the cause of the slippage and in and this alternative will not ensure results.

7. Additional Measures to Improve At-Sea Sampling

2.1.1 Alternative Set 1: Additional Vessel Reporting Measures

[55] *See* Amendment 14 DEIS at p.130.
[56] *See* Amendment 14 DEIS, Appendix 5 at p. 658.
[57] *See* MEFMC Herring Committee Meeting, July 27, 2010. In 2009, 35% of observed Atlantic herring hauls were completely or partially released during 2009, with over a thousand metric tons released. With only 1/5 of the trips (in 2009) observed, the total quantity of fish released in much high than actually observed.
[58] *See* Amendment 14 DEIS at p.130 ("From 2006-2010 approximately 9% of hauls on observed longfin squid trips [] and 26% of hauls on observed mackerel trips [] had some unobserved catch."). *See also* SSC materials from Mary 2012 which suggests that slippage has increased from previous estimates under the Butterfish Bycatch Program to 14%, available at: http://www.mafmc.org/meeting_materials/SSC/2012-05/3-2011-Butterfish-Cap-Report(May%202012).pdf.

To improve quota monitoring and enforcement the Herring Alliance strongly supports the following Alternatives:

- **Alternative 1c: Institute weekly vessel trip reporting (VTR) for all MSB permits (Mackerel, longfin quid//Butterfish, *Illex*) so as to facilitate quota monitoring (directed landings and/or incidental mortality cap if applicable) and cross checking with other data sources.**
- **Modified Alternative 1d 48: Require all mackerel trips give 48 hour pre-trip notification to NMFS to fish for, catch, possess, retain, transfer, or land more than 2,000 pounds of mackerel so as to facilitate observer placement.**
- **Alternatives 1eMack & 1eLong: require VMS for limited access mackerel vessels and longfin squid/butterfish moratorium vessels;**
- **Modified Alternative 1fMack – requires daily VMS reporting of catch by limited access mackerel vessels. Modified to make this frameworkable in the event that a mortality cap becomes necessary in the squid fishery.**
- **Modified Alternative 1f Long: Require daily VMS reporting of catch by longfin squid moratorium permits so as to facilitate monitoring (directed and/or incidental catch) and cross checking with other data sources. Requiring VMX and trip declarations would be a prerequisite for this alternative. Modified to make frameworkable in the event that a mortality cap becomes necessary in the squid fishery.**
- **Modified Alternatives 1gMack and 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 would facilitate quota monitoring, enforcement, and/or portside monitoring.**

Weekly VTR for all MSB permits (mackerel, longfin squid/butterfish, Illex) will facilitate quota monitoring (directed landings and/or incidental mortality cap if applicable) and cross checking with other data sources. 48 hour pre-trip notification to NMFS for those mid-water trawl and Tier 1 and 2 SMBT vessels intending to retain, possess, or transfer more than 2,000 pounds of mackerel is critical for observer placement and consistent with the recommended alternatives for observer coverage above. Because the VMS on limited access mackerel vessels and longfin squid/butterfish moratorium vessels, as well as daily reporting of catch will also facilitate monitoring (directed and/or incidental) and cross checking of other data sources. As noted in the DEIS a great majority of these limited access mackerel and squid/butterfish moratorium permitted vessels are already equipped with VMS.[59] Six (6) hour pre-landing notification via VMS to land more than 20,000 pounds of mackerel or more than 2,500 pounds of longfin squid, will also facilitate quota monitoring, enforcement, and/or portside monitoring. In addition, the Atlantic herring FMP already mandates reporting measures identical to or very similar to each of the alternatives listed above, making these proposed measures necessary for improved consistency between the two plans.

2.1.2 Alternative Set 2: Additional Dealer Reporting Measures

[59] *See* Amendment 14 DEIS at pp. 292, 294.

To precisely estimate incidental catch of RH/S in these fisheries the Herring Alliance supports the following alternatives:

- **Modified Alternative 2b: Require federally permitted MSB 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; and**
- **Modified Alternatives 2c and 2d: Require that federally permitted SMB dealers weigh all landings related to mackerel transactions over 2,000 pounds. If dealers do not sort by species they would need to document in dealer applications or with each transaction so long as the proper methodology was documented.**
- **Alternative 2e: Require that federally permitted SMB dealers weigh all landings related to longfin squid transactions over 2,500. If dealers do not sort by species, they would need to document in dealer applications how they estimate relative compositions of a mixed catch.**
- **Alternative 2f: Require that federally permitted SMB dealers weigh all landings related to longfin squid transactions over 2,500 pounds. If dealers do not sort by species, they would need to document with each transaction how they estimate relative compositions of a mixed catch.**

Standardizing the methods by which dealers are required to weigh all catch and 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 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.[60]

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. The Herring Alliance views this suite of alternatives (Modified Alternatives 2b- 2d, Alternative 2e, and Alternative 2f) as working together to minimize dealer reporting while providing for increased efficiency and flexibility. Dealers that do not sort by species could document their method for estimating the composition of a mixed catch. Consistent with previous alternative chosen, the modification of Alternative 2b, 2c, and 2d will decrease the incidental landings limit of mackerel from 20,000 pounds to 2,000 as the trigger for dealers to weigh all landings and to obtain vessel representative confirmation of SAFIS transactions.

* * *

[60] *See* Amendment 14 DEIS at p. 279.

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

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

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

Massachusetts
Striped Bass Association

Since 1950

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 Mr. Moore:

The MSBA has been recognized in many venues as speaking for the New England recreational fishing community on the issue of reforming the Atlantic Mackerel 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.

We are concerned that the Atlantic Mackerel fishery is having a detrimental effect on recreational fishing in New England. Collectively, the recreational fishing community wants regulations adopted that bring strict monitoring and accountability to the industrial scale operators within the Atlantic Mackerel fishery. Our community believes that this can be achieved if the NEFMC were to adopt the following set of alternatives:

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,	Federally-permitted MSB dealers must weigh all landings related

Alternative Set	Preferred Alternative	Description to be applied to the MSB FMP
	d, e, & f	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
	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

Alternative Set	Preferred Alternative	Description to be applied to the MSB FMP
	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

-

We thank both MAFMC members & staff for considering our comments.

Sincerely

Capt. Patrick Paquette
MSBA Gov;t Affairs

CHOIR COALITION

***C**oalition for the Atlantic **H**erring Fishery's **O**rderly, **I**nformed and **R**esponsible Long Term Development*

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.

L**astly, 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,

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
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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

<u>Charter and Guide Companies:</u>

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
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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
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Live Wire Charters, Capt. Rick Hanlin, Sabattus, ME
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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
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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
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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
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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
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Boston Fishing Charters, Kateiri Bousaleh, Braintree, MA
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Fin Addicition Charters, Capt. Jeff Smith, Wellfleet, MA
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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
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Fishtale Sportfishing, Capt. Mort Terry, Harwich Port, MA
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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
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Tomahawk Charters, Capt. Buddy Vanderhoop, Aquinnah, MA
Capt. Clarke Charters, Capt. Jennifer Clarke, Chilmark, MA
North Shore Charters, Capt. Scott McDowell, Chilmark, MA
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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
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Featherwedge Charters, Capt. Nick Warburton, Menemsha, MA
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Capt. Bucky Burrows Charters, Capt. Bucky Burrows, Vineyard Haven, MA
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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
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Snapper Charters, Capt. Doug Lindley, Nantucket, MA
Monomoy Charters & Critter Cruise, Capt. Josh Eldridge, Nantucket, MA
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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

***C**oalition for the Atlantic **H**erring Fishery's **O**rderly, **I**nformed and **R**esponsible Long Term Development*

June 4th, 2012

Dr. Christopher M. Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901

Re: Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (SMB) FMP

Dear Chris,

I am writing today on behalf of CHOIR to support increased monitoring of the midwater trawl mackerel fishery as well as stronger rules in other parts of the FMP. CHOIR is an industry coalition made up of over 650 commercial and recreational fishing organizations, fishing and shore side businesses, researchers and eco-tourism companies that rely on healthy stocks of herring and other forage species.

It is critical that there is consistency between the final Herring Amendment 5 and the SMB Amendment 14 given that many of the same boats target both mackerel and herring. Without consistency between the two plans there will be loopholes that will be exploited, undermining the rules in both of these fisheries.

I have attached the CHOIR Amendment 5 Sign On Letter, signed by over 650 CHOIR supporters that are advocating for increased monitoring, dumping controls, and better accountability. It is critical to CHOIR that these same measures be adopted in the mackerel fishery so that there are no loopholes. When a boat goes mackerel fishing it needs to be held to the same standards as those followed on a boat going herring fishing.

Mackerel, like herring, is an important forage fish in the Gulf of Maine and on George's Bank and we believe that there must be increased monitoring and antidumping provisions. Please read though our Amendment 5 letter and note of all the commercial fishermen, groups and other businesses that signed on in support of these important new rules on the large midwater trawl fishery.

Thanks for your time,

Stephen B Weiner

Steve Weiner, Chair

Didden, Jason T.

From: Bonnie Brady <greenfluke@optonline.net>
Sent: Monday, June 04, 2012 11:46 PM
To: MSBAmendment14@noaa.gov; Didden, Jason T.
Subject: amendment 14 comments

June 4, 2012

Dr. Christopher Moore

Executive Director

Mid-Atlantic Fishery Management Council

800 N State Street, Suite 201

Dover, DE 19901

Re: Amendment 14

Dear Dr. Moore,

On the behalf of the Long Island Commercial Fishing Association, we would like to offer the following comments re Amendment 14 to the Atlantic Mackerel, Squid and Butterfish Fishery Management Plan.

2.1.1

We support weekly VTRs for MSB permits. (1c)

We support 48 hours notice for pre-trip notification (1d48)

We do not support VMS for mackerel or longfin squid boats unless money could be made available to the fleet for the purchase of this costly equipment as was done by the PFMC several years ago.
http://www.pcouncil.org/groundfish/background/document-library/vessel-monitoring-systems/

The cost to purchase, plus monthly fees in the range of $200/monthly, is too expensive for many of the participants in these fisheries.

We do not support daily VMS reporting because of the same cost issue noted above.

We support 1FMack, 1fLong, 1gMack, and 1gLong only if funds were made available for VMS purchase.

2.1.2

We do not support 2b. Fishermen in New York already are buried with administrative work, both electronic and paper, relating to landing fish, and in NY often do not have the facilities to accurately weigh fish past hail weights since their fish are boxed at sea. That which the dealer weighs and receives is what the fisherman is paid for. Dealer reports are the gold standard for weight and should still be utilized at the point of contact. Untold hours of internet fact-checking of weights is not possible in most small fishing businesses today in New York, nor should it be required. Dealer reports have all the information necessary.

We do not believe that MSB species should be weighed using a volume weight conversion, because of the costs to industry including requiring vessel hold certification. In other words, all species should be weighed.

2.1.3

We support 3b. Can't imagine why we would need to support 3c- its is a no brainer- if the observer doesn't know when hauling back/pumping is occurring, perhaps they should look to another profession. But for the sake of argument, we support 3c, along with 3d, and 3e.

We do not support 3f, 3g or 3j due to safety issues. We do not support 3h, 3I, 3j, 3k, 3l, 3m, 3n, 3o, and 3p- as slippage can occur for a variety of safety reasons, and to force fishermen to either choose between hauling/pumping in an unsafe state or face termination of trip could promote risk-taking during normal operations instead of consistently safe fishing practices.

2.1.4

We support 4a

Industry cannot afford one more additional forced sampling/observer cost as the proverbial straw breaking industry's economic back. If NMFS or outside environmental interests want additional observers, then NMFS or the outside environmental interests must pay for them. We cannot support 4b, 4c, 4d or 4e because of the additional fishing community costs which are not mixed and would have a certain and catastrophic net impact on the individual boats and their communities.

We support 4f.

2.1.5

We cannot support any of the 5-alternatives for the same reasons as above in 2.1.4 paragraph one. They are cost prohibitive with no other alternative seen except to force boats out of the fishery.

2.1.6

We support 6a

In a recent studies there was less than one half of one percent of incidental bycatch of river herring compared to catch in the squid fishery. There is no need for a cap. River herring is being used by outside interests as the aquatic version of the blue salamander tossed across the neighbor's property to prevent them from building; its only purpose through its inferred swimming co-existence is to decimate a healthy, sustainable Mid-Atlantic small mesh fishery based on dogma and not science.

2.1.7

We support 7a.

2.1.8

We support 8a

2.1.9

We support 9a

Thank you for taking the time to address our concerns.

Sincerely

Bonnie Brady,
Executive Director,
LICFA

Peter deFur, PhD
1006 Pump Road
Suite 200
Henrico, VA 23238

June 1, 2012

Dear Dr. deFur:

We represent 15 Virginia based organizations and are writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad by including robust, science-based conservation and management measures in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. The Council is currently accepting public comment on this Plan.

Historically, river herring and shad flooded the Chesapeake Bay and its tributaries each spring, supporting the Bay's ecological diversity and rich and deep traditions that commercial watermen and recreational anglers enjoyed for centuries. In the wake of the dramatic decline of these fish, many of us have spent countless hours working to restore river herring and shad habitat in Virginia, monitoring water quality and cleaning up waterways. Our state and local governments have devoted millions of dollars towards restoring our coastal estuaries and rivers by regulating pollution and restoring spawning grounds. To assist in their recovery of these important forage fish, Virginia recently implemented a moratorium on commercial and recreational fishing for river herring. American shad fisheries have been closed since 1994. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes recovery. The Northeast Fisheries Science Center estimates that millions of river herring and shad are caught every year by industrial mackerel and Atlantic herring trawlers operating in federal waters. We are encouraged that the MAFMC and New England Fishery Management Council are currently developing plans to address this problem. We ask the MAFMC to set the standard for protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in the mackerel fishery.

- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come.

Thank you for your consideration,

Bill Tanger
Chair
Friends of the Rivers of Virginia
Roanoke, VA

Nicole Haughy
Virginia Aquarium
Virginia Beach, VA

David Gracic
Wild River Outfitters
Virginia Beach, VA

Charles Hulse
Culinary Institute of Virginia
Virginia Beach, VA

Whit Peace
Stewardship and Access Committee
Lynnhaven River Now
Virginia Beach, VA

Fred Adams
Executive Board
Chesapeake Bay Group Sierra Club
Virginia Beach, VA

Cindy Rauch
Owner
The Skinny Dip
Virginia Beach, VA

Peggy Sijswerda
Editor & Co-Publisher
Tidewater Women
Virginia Beach, VA

Craig Grube
Senior Director
Portfolio Recovery Associates
Virginia Beach, VA

Guy J. Hall
Sustainable Building Solutions
Virginia Beach, VA

Sue Gordon
FFCF
Virginia Beach, VA

Mark Feltner
President
Virginia Coastal Access Now
Chesapeake, VA

Bill Tanger
Conservation Chairman
Float Fishermen of Virginia
Roanoke, VA

Jeff Kelble
Riverkeeper
Shenandoah Riverkeeper
Winchester, VA

Wade O'Neill
Chef instructor and a retired Air Force major
ECPI
Norfolk, VA

www.gardenstateseafood.org

Gregory P. DiDomenico, Executive Director
609-675-0202
gregdi@voicenet.com

212 West State Street
Trenton, New Jersey, 08608
Office (609) 898-1100

June 5, 2012

Dr. Christopher M. Moore
Executive Director
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901
Re: **Amendment 14 –** email to: msbamendment14@noaa.gov / jdidden@mafmc.org

Dear Dr. Moore:

Please accept these comments on behalf of the Garden State Seafood Association (GSSA); GSSA is comprised of commercial fishermen, shore-based processors, commercial dock facilities, seafood markets, restaurants, and various industry support businesses from New Jersey.

2.1.1 Alternative Set 1: Additional Vessel Reporting Measures

We support the following alternatives;

- **1b** which would institute weekly vessel trip reporting for Atlantic mackerel permits to facilitate quota monitoring and cross checking with other data sources.
- **1d72**which would require 72 hour pre-trip notification to the National Marine Fisheries Service (NMFS/the Agency) to facilitate observer placement (as currently required in the Atlantic herring FMP).
- **1eMack and 1eLong** which would require VMS for limited access mackerel vessels and moratorium longfin vessels.
- **1fMack and 1fLong** which would require daily VMS reporting of catch by limited access mackerel vessels and moratorium longfin vessels.
- **1gMack** which would require 6 hour pre-landing notification via VMS for all limited access mackerel vessels.

2.1.2 Alternative Set 2: Additional Dealer Reporting Measures

We are opposed to alternative 2b, which would require federally permitted MSB dealers to obtain vessel representative confirmation of SAFIS transaction records for mackerel landings over 20,000

pounds, *Illex* landings over 10,000 pounds and longfin squid landings over 2,500 pounds. The purpose of this proposal is to catch errors at the first point of entry in the data system but places fishermen and dealers in a potentially adversarial, competitive regulatory posture that should be reserved for the Agency. 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 (hails) and actual weights vary, which they will certainly continue to do.

We support alternative 2d, which would require that federally permitted SMB dealers weigh all landings related to mackerel transactions of 20,000 pounds but we believe this alternative should reach all mackerel landings. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch.

We support alternative 2f, which would require that federally permitted SMB dealers weigh all landings related to longfin squid transactions over 2,500 pounds but we believe this alternative should reach all longfin squid landings. If dealers do not sort by species, they would need to document with each transaction how they estimated the relative composition of a mixed catch.

2.1.3 Alternative Set 3: Additional At-Sea Observation Optimization Measures

We support alternatives 3b and 3c, which would require Captains and crew to provide reasonable assistance to observers and provide observers notice when pumping/haul back occurs on vessels with mackerel limited access and/or longfin squid moratorium permits.

We support the intent of alternative 3d, which would place an observer on any vessel taking on fish wherever/whenever possible, on vessels with mackerel limited access permits. We recognize that the assignment of an observer on each vessel in a pair trawl operation (primarily in the mackerel and herring fisheries) has been at the discretion of the Northeast Fisheries Observer Program (NEFOP) up to this point in time. In addition this alternative does not apply to the longfin squid fishery.

We support alternative 3e for the Mackerel fishery only, requiring the use of a "Released Catch Affidavit" if unobserved fish is released, or 'slipped' for any reason. I have not been made aware of any complaints from NEFOP observers and assume they are satisfied with the cooperation they are already receiving onboard vessels.

We are opposed to alternatives 3f, 3g and 3j, which would require all fish to be discarded to be brought aboard for sampling by the observer. As we have repeatedly pointed out during the development of A14, and herring A5, 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 most, if not all, midwater trawl fishing vessels.

We are strongly opposed to alternatives 3h, 3i, 3j, 3l, 3m, 3n, 3o and 3p (proposing trip termination after any slipped catch) as being simply punitive in nature and not constructive to the ongoing cooperation between our Captains, our crews and the observers on our vessels.

It is important, however, to retain in regulation, as has been done in the herring fishery, that fish can be released throughout the mackerel and longfin squid fisheries (although pumping does not normally occur in the longfin squid 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.

2.1.4 Alternative Set 4: Port-Side and Other Sampling/Monitoring Measures

We are opposed to alternatives 4b and 4c, which would require industry-funded 3rd party port-side landings sampling programs for mackerel and longfin squid vessels. To the extent possible, A14 and herring A5 should be consistent in their requirements concerning the mackerel and herring fisheries' efforts to reduce catches of river herring and shad, principally because many of these vessels (primarily those in the mackerel fishery) operate in both fisheries, depending upon the seasonal availability of the fishery resources that are the target of these directed fisheries.

We are opposed to alternative 4e, which would require volumetric vessel-hold certification for longfin squid moratorium permits.

We support alternative 4f for the herring and mackerel fisheries only, a two-phase bycatch avoidance approach based on the SFC/SMAST/DMF project, as the only option that will best work to reduce the incidental catch of river herring in the herring, mackerel fisheries and allow for the continued production of optimum yield from the Atlantic herring and mackerel fishery resources.

2.1.5 Alternative Set 5: At-Sea Observer Coverage Requirements

We support alternative 5b1, which would require 25% of MWT mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers.

We support alternative 5c1, which would require 25% of SMBT (<3.5 in) mackerel trips by federal vessels intending to retain over 20,000 pounds of mackerel to carry observers. The NEFSC would assign coverage based on pre-trip notifications.

We support alternative 5h, which would require reevaluation of coverage requirement after 2 years to determine if incidental catch rates justify additional high coverage rates at the %25 level. If an analysis justified continued rates of observer coverage, a limited industry funded observer program would be considered at that time.

2.1.6 Alternative Set 6: Mortality Caps

We support alternative 6a, the no-action alternative. We do not support the Council considering a historical catch-based or a biologically-based cap, through either a framework adjustment process or the specifications process with this amendment. It is our understanding that neither the FMAT nor the herring PDT have recommended the establishment of a cap because there is insufficient information upon which to base one.

The relative mortality effects of incidental catches in the mackerel, longfin squid and herring fisheries are unknown and would be critically important to understand before attempting to set a biologically-based cap and risk the industry's ability to fish successfully for mackerel, longfin squid or herring.

As for our knowledge of the river herring bycatch in the longfin squid fishery, recent estimates from the observer trips associated with the bycatch cap indicate minimal amounts.

2.1.7 Alternative Set 7 – Restrictions in areas of high RH/S catch

We support alternative 7a, the no-action alternative. We have previously identified our support for increased observer coverage in the mackerel fishery, and have agreed to fund additional coverage if it is justified after a 2 year review, which will help to identify the amount of river herring and shad that may be encountered, on a day-to-day basis during those times and in those areas where the fish may be found. We are opposed to area closures as they are not sensitive to which fish species may be found within them, on a real-time basis. In addition, the SMAST bycatch avoidance project will continue to work to direct the fleets away from where concentrations of river herring and shad may be found, also in real-time, so

that we can meet the National Standard 9 requirement that, to the extent practicable, the incidental catch of and mortality of river herring and shad species be minimized.

2.1.8 Alternative Set 8 – Hotspot Restrictions

We support alternative 8a, the no-action alternative.

2.1.9 Alternative Set 9 – Addition of RH/S as "Stocks in the Fishery" in the MSB FMP

We support alternative 9a, the no-action alternative. Under the no-action alternative, primary RH/S management would continue to rest with the states, as coordinated through the ASMFC, as stated at page 82 of the PHD.

The January 16, 2009 Final Rule amending the guidelines for National Standard 1 (NS1) provides guidance to the Councils concerning criteria necessary to establish target and non-target species as "stocks in the fishery" stating that ***"Stocks in the fishery" need status determination criteria, other reference points, ACL mechanisms and AMs."***

It is our opinion, after reviewing the recently published ASMFC stock assessment for river herring and the accompanying peer review report, there continues to be insufficient information upon which to establish a status determination for these species.

In discussing the population model used in the ASMFC assessment (page 19), the Peer Review panel stated, ***"In summary, the panel concurred with the SASC (Stock Assessment Subcommittee) that the DB-SRA (depletion-based stock reduction analysis) model did not adequately model river herring stock conditions and should not be used to assess status."***

Also, in response to TOR 6 of the assessment, *"Evaluate stock status determination from the assessment; if appropriate, recommend changes or specify alternative methods/measures"* (page 23), the Peer Review panel found, ***"Coast wide status of the stock (biomass and exploitation rates) in relation to management reference points could not be determined."***

Since the revised NS1 guidelines are clear that identifying "stock determination criteria" is a necessary condition for a Council to establish a species as a "stock in the fishery", it is therefore inappropriate for RH/S stocks to be designated as such in the SMB FMP. It is our view that the SMB FMP is sufficient to work to minimize bycatch and the mortality of the bycatch of RH/S stocks when they may be found in the ocean, through the management measures that we are supporting in our comments concerning the PHD.

The outcome of the NEFMC's consideration, and rejection, of RH/S species as "stocks in the Atlantic herring fishery" should be instructive for the MAFMC. In the March 2, 2011 Final Rule, implementing "approved measures" in A4 to the Atlantic herring FMP (FR Vol. 76, No.41), the NMFS makes the following statements concerning this issue: ***"While other species are caught incidentally when fishing for herring, herring is the target stock, and the only stock directly managed by the Herring FMP. This action established herring as a stock in the fishery…Bycatch in the herring fishery will continue to be addressed and minimized to the extent possible, consistent with other requirements of the MSA."***

Sincerely,

Gregory P. DiDomenico

Gregory P. DiDomenico
Executive Director
Garden State Seafood Association

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

43rd Legislative District
Baltimore City

Chair
Education, Health, &
Environmental Affairs Committee

Chair
Health Subcommittee

Vice Chair
Environment Subcommittee

The Senate of Maryland
ANNAPOLIS, MARYLAND 21401
JOAN CARTER CONWAY
STATE SENATOR

Annapolis Office
Miller Senate Office Building
11 Bladen Street, Suite 2 West
Annapolis, Maryland 21401
410-841-3145 · Fax 410-841-3135
Joan.Carter.Conway@senate.state.md.us

District Office
2831 Hillen Road
Baltimore, Maryland 21218
410-467-7125
Fax 410-467-6692

June 6, 2012

Dear Maryland Council Members:

I am writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad by including robust, science-based conservation and management measures in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan.

Maryland's rivers once teemed with river herring and shad, providing an abundant food source for wildlife, opportunities for commercial and sport fishing, and a wildlife viewing experience that delivered ocean bounty to our towns. Conservationists and legislators alike have spent countless hours working to restore river herring and shad runs in Maryland, monitoring water quality and cleaning up waterways. The Maryland General Assembly has dedicated millions of dollars towards restoring our coastal estuaries and rivers by regulating pollution and restoring habitat. Maryland recently implemented a moratorium on commercial and recreational fishing for river herring. American shad fisheries have been closed since 1980 with the exception of a small catch and release fishery. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes recovery. The Northeast Fisheries Science Center estimates that millions of river herring and shad are caught every year by industrial mackerel and Atlantic herring trawlers operating in federal waters. We are encouraged that the MAFMC and New England Fishery Management Council are currently developing plans to address this problem. We ask the MAFMC to set the standard for protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in the mackerel fishery.

- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.

- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for your consideration.

Sincerely,

Senator Joan Carter Conway
43rd Legislative District

cc:

Howard King
240 Harbor Lane
Queenstowne, MD 21658

Steven Linhard
1004 Jackson Street
Annapolis, MD 21403

Mike Luisi
Maryland DNR
Tawes State Office Bldg, B-2
580 Taylor Avenue
Annapolis, MD 21401

MAGGIE MCINTOSH
43rd Legislative District
Baltimore City

Chairman
Environmental Matters Committee

The Maryland House of Delegates
6 Bladen Street, Room 251
Annapolis, Maryland 21401
410-841-3990
Toll Free From Baltimore

The Maryland House of Delegates
ANNAPOLIS, MARYLAND 21401

June 4, 2012

Howard King
240 Harbor Lane
Queenstowne,
MD 21658

Steven Linhard
1004 Jackson Street
Annapolis, MD
21403

Mike Luisi
Maryland DNR
Tawes State Office Bldg, B-2
580 Taylor Avenue
Annapolis, MD 21401

Dear Maryland Council Members:

I am writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad by including robust, science-based conservation and management measures in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan.
Maryland's rivers once teemed with river herring and shad, providing an abundant food source for wildlife, opportunities for commercial and sport fishing, and a wildlife viewing experience that delivered ocean bounty to our towns. Conservationists and legislators alike have spent countless hours working to restore river herring and shad runs in Maryland, monitoring water quality and cleaning up waterways. The Maryland General Assembly has dedicated millions of dollars towards restoring our coastal estuaries and rivers by regulating pollution and restoring habitat. Maryland recently implemented a moratorium on commercial and recreational fishing for river herring. American shad fisheries have been closed since 1980 with the exception of a small catch and release fishery. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes recovery. The Northeast Fisheries Science Center estimates that millions of river herring and shad are caught every year by industrial mackerel and Atlantic herring trawlers operating in federal waters. We are encouraged that the MAFMC and New England Fishery Management Council are currently developing plans to address this problem. We ask the MAFMC to set the standard for protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in the mackerel fishery.

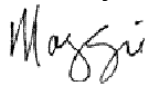
- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.

- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for your consideration.

Sincerely,



Delegate Maggie McIntosh
Chair, Environmental Matters Committee
District 43
Baltimore City

June 4, 2012

Lee Anderson
206 Sypherd Dr
Newark, DE 19711

David E. Saveikis, Director
Division of Fish and Wildlife
89 Kings Highway
Dover, DE 19901

Richard Cole
Division of Fish & Wildlife
PO Box 330
Little Creek, DE 19961

Dear Delaware Council Members:

We represent more than 16 Delaware based organizations and are writing to request that the Mid-Atlantic Fishery Management Council ("MAFMC") take the lead on federal management of river herring and American shad by including robust, science-based conservation and management measures in Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. These comments are in response to the open public comment period for this Plan.

Delaware's rivers and estuaries once supported abundant river herring and shad, providing opportunities for recreational fishing and an abundant food source for wildlife. Many of us have spent countless hours working to restore river herring and shad habitat in Delaware, monitoring water quality and cleaning up waterways. Our state and local governments have devoted millions of dollars towards restoring our coastal estuaries and rivers by regulating pollution and restoring spawning grounds. Delaware recently implemented a moratorium on commercial and recreational fishing for river herring and a similar moratorium on American shad is imminent. But more work needs to be done in federal waters to recover these depleted fish.

In federal waters, the incidental catch of river herring and shad remains a serious concern, and impedes recovery. The Northeast Fisheries Science Center estimates that millions of river herring and shad are caught every year by industrial mackerel and Atlantic herring trawlers operating in federal waters. We are encouraged that the MAFMC and New England Fishery Management Council are currently developing plans to address this problem. We ask the MAFMC to set the standard for protecting river herring and shad and ensure that Amendment 14 has robust management measures that protect river herring and shad throughout their range in federal waters, including:

- Incorporation of river herring and shad as stocks within the federal fishery management plan for Atlantic mackerel, squid and butterfish. This action would afford river herring and shad direly needed conservation and management measures in federal waters.

- An interim cap or limit in 2013 on river herring and shad catch in the mackerel fishery.

- 100 percent at-sea monitoring on all mid-water trawl fishing trips, including assigning one observer to each vessel in a pair trawl operation. This fleet of approximately 20 mid-water trawl vessels is responsible for over 70% of combined river herring and shad incidental catch.

- An accountability system to discourage the wasteful slippage, or dumping, of unsampled catch. All catch must be made available to fishery observers for systematic sampling.

- A requirement to weigh all catch.

With your support of these measures, and our continued commitment to restoring inshore habitat, we can promote the recovery of our river herring and shad runs and ensure their survival for many generations to come. Thank you for your consideration.

Sincerely,

Bill Moyer, President
Inland Bays Foundation
Dagsboro, Delaware

Brian Winslow, Executive Director
The Delaware Nature Society
Hockessin, Delaware

Maya vanRossum, the Delaware Riverkeeper
Bristol, Pennsylvania

Elizabeth K. Brown, of Counsel
The Delaware Riverkeeper Network
Bristol, Pennsylvania

Sarah Bucic, Vice-Chair
Sierra Club- Delaware Chapter
Wilmington, Delaware

Jim Black, Vice-Chair
Sierra Club- Delaware Chapter
Wilmington, Delaware

Lynn Williams, President, on behalf of the Board of Directors
Christina Conservancy
Wilmington, Delaware

Phil Kline, Senior Ocean Campaigner
Greenpeace- Delaware Chapter
Washington, District of Columbia

Shirley Posey, President
Christina River Watershed Cleanup
Bear, Delaware

Sallie Forman, President and Founder
Save Our Lakes Association 3
Rehoboth Beach, Delaware

Alan Mueller, Executive Director
Green Delaware
Port Penn, Delaware

Melinda Hughes-Wert, Executive Director
Nature Abounds
Clearfield, Pennsylvania

Michael Tyler, President
Citizens Coalition, Inc.
Nassau, Delaware

Nancy Diehl, Member
Delaware City Environmental Commission
Delaware City, Delaware

James Jordan, Executive Director
Brandywine Valley Association
West Chester, Pennsylvania

Robert Struble, Watershed Conservation Director
Red Clay Valley Association
West Chester, Pennsylvania

Doug Parham, Member
Inland Bays Foundation
Dagsboro, Delaware

Stuart Dick, Member
Ducks Unlimited
Wilmington, Delaware

Amy Roe, Ph.D, Member of many environmental organizations
Newark, Delaware

Didden, Jason T.

From: MSB Amendment14 <msbamendment14@noaa.gov>
Sent: Tuesday, June 05, 2012 10:04 PM
To: Didden, Jason T.
Subject: Fwd: Comments on Draft Amendment 14 -- Manage river herring and shad as stocks in the fishery

---------- Forwarded message ----------
From: **Anita Buffer** <mybuff.net@comcast.net>
Date: Thu, May 31, 2012 at 6:26 AM
Subject: Comments on Draft Amendment 14 -- Manage river herring and shad as stocks in the fishery
To: msbamendment14@noaa.gov

May 31, 2012

Executive Director Christopher Moore

Dear Executive Director Moore,

Behave RESPONSIBLY. Don't act with GREED.

The Mid-Atlantic Fishery Management Council and the National Marine Fisheries Service MUST begin MANAGING DEPLETED populations of river herring and shad as stocks in the fishery.
Unmanaged catch of river herring and shad by industrial trawlers has contributed to a COLLAPSE of populations of these small but ECOLOGICALLY IMPORTANT FISH.

With river herring and shad landed catch DOWN 99 and 97 percent.
Most states have BANNED their harvest and the Fisheries Service is considering listing river herring under the ENDANGERED Species Act.

Yet mackerel and squid trawlers can catch MILLIONS of river herring and shad every year WITHOUT RESTRICTION or even ADEQUATE MONITORING

This is UNACCEPTABLE.

We NEED conservation and management within the FEDERAL FISHERIES in which they're caught befroe they are all GONE.

As the council finalizes Amendment 14 to the Mackerel, Squid and Butterfish Fishery Management Vote in favor of adding blueback herring, alewife, American shad and hickory shad as stocks in the fishery management plan (Action Alternatives 9b-e).

** A catch CAP for river herring and shad in the Atlantic mackerel fishery (Action Alternatives 6b-6c).
** 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

(Action Alternatives 5b4 and 3d).
** An ACCOUNTABILITY SYSTEM to PROHIBIT or discourage WASTEFUL OPERATIONAL DISCARDS. All catch must be made available to fishery observers for systematic sampling (Action 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).

Every year states and communities throughout the mid-Atlantic 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 Mid-Atlantic Fishery Management Council and the National Marine Fisheries Service MUST DO THEIR PAR and step FORWARD to adequately REGULATE these important species.

Sincerely,

Ms. Anita Buffer
Winding Way
Warminster, PA 18974-5453
(267) 282-5147

Didden, Jason T.

From: MSB Amendment14 <msbamendment14@noaa.gov>
Sent: Tuesday, June 05, 2012 10:03 PM
To: Didden, Jason T.
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: msbamendment14@noaa.gov

Dear Mr. Moore,

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

Didden, Jason T.

From: MSB Amendment14 <msbamendment14@noaa.gov>
Sent: Tuesday, June 05, 2012 10:03 PM
To: Didden, Jason T.
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: msbamendment14@noaa.gov

Dear Mr. Moore,

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

Appendix 10 - **Amendment 14 Hearing Summaries**

Amendment 14 Public Hearings Summary (April/May 2012)

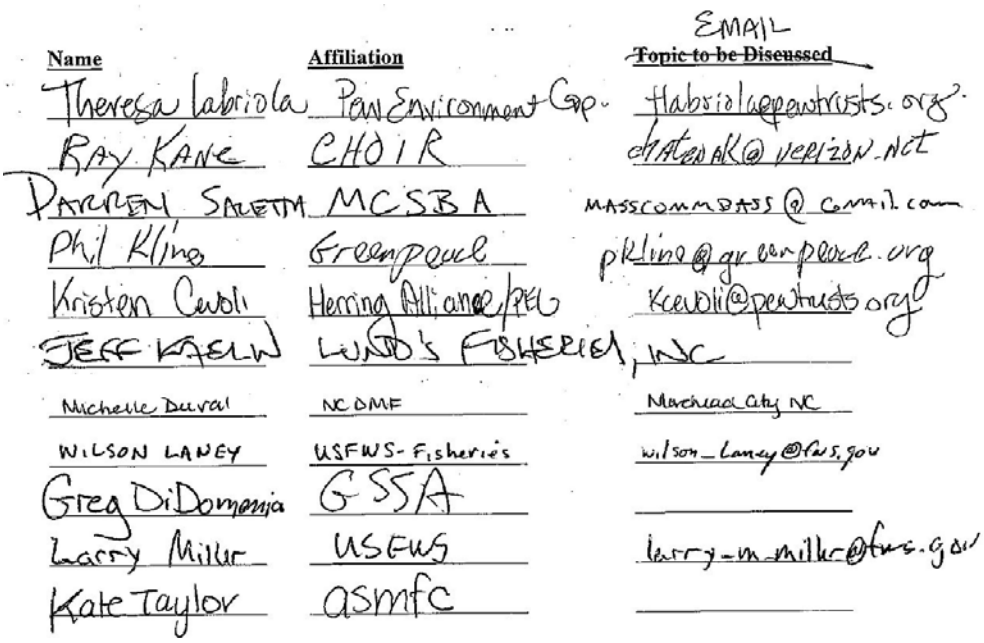
Public / Scoping Hearings

Meeting Type	Date	Time	Location	Information
Mackerel-Squid-Butterfish Amendment 14 Public Hearings (River Herring & Shad Issues)	April 30, 2012	5:30-7:30 pm	Alexandria, VA	See FR notice for meeting details (click here)
	May 15, 2012	7-9 pm	Riverhead, NY	
	May 16, 2012	6-8 pm	Internet Webinar with listening station in Newport News, VA	
	May 17, 2012	7-9 pm	Cape May, NJ	
	May 21, 2012	6-8 pm	Gloucester, MA	
	May 22, 2012	5:30-7:30 pm	Warwick, RI	

Note: RH/S = River Herring and Shad

4/30: Alexandria, VA (At the ASMFC Meeting)

Attendance:



Name	Affiliation	EMAIL ~~Topic to be Discussed~~
Theresa Labriola	Pew Environment Grp.	tlabriola@pewtrusts.org
RAY KANE	CHOIR	chatoak@verizon.net
DARREN SAUETM	MCSBA	masscommbass@comil.com
Phil Kline	Greenpeace	pkline@greenpeace.org
Kristen Cwoli	Herring Alliance/PEW	Kcwoli@pewtrusts.org
JEFF KAELIN	LUND'S FISHERIES, INC	
Michelle Duval	NC DMF	Morehead City NC
WILSON LANEY	USFWS-Fisheries	wilson_laney@fws.gov
Greg DiDomenico	GSSA	
Larry Miller	USFWS	larry_m_miller@fws.gov
Kate Taylor	asmfc	

Comments:

Greg DiDomenico: Can you look at which vessels are responsible for most bycatch?

Ray Kane: I would like to see more accountability and consistency with NEFMC Amendment 5. A shared strategy should include:

1)100% observer coverage on high-volume vessels in upper limited access tiers of mackerel and herring (including an observer on both vessels in pair trawl operations).
2)Increased observer coverage for minor limited access participants to improve estimates but should consider their relative contribution to overall landings
3)Improve dealer reporting and make consistent across FMPs including requiring weighing and sorting all catch for all vessels
4)For all vessel to bring all catch including operational discards aboard for observer sampling (similar to closed area 1 rules in New England).
5)Implement RH/S catch caps and use RH protection areas (and closed areas) until catch caps are implemented (not trigger based).

Pam Lyons-Gromen (on behalf of National Coalition for Marine Conservation):
-Catch of RH/S in federal waters is unrestricted (versus severe state restrictions)
-A regional and fleet based approach is appropriate
-MWT fisheries account for 71% or RH/S incidental catch
-SMBT fisheries account for 24% of RH/S catch
-Need consistency throughout Mid-Atlantic and New England
-Strongly support adding RH/S as stocks in the fishery
  -Would add resources and tools to conserve RH/S
-A fragmented approach is likely to fail.
-NCMC will follow-up with specific comments

Phil Klein, Greenpeace USA
-Support comments of Ray Kane and Pan Lyons-Gromen
-Observers and good data are critical
  -100% on MWT, as high as is feasible for rest of fleet
-Work cooperatively across range of fish…add as stocks in the fishery
-Don't allow tows to be dumped before contents can be sampled
-These would lead to a catch cap

Darren Saletta, Massachusetts Commercial Striped Bass Association
-Need consistency with New England
-VMS and VTR alternatives appear good
-Need to know what is being caught, 100% observer coverage
-Need to do everything we can to reduce slippage events and fully account for all fish
-Would like to see coast-wide caps.
-Consider recent studies that concluded forage fish have higher value as forage than landings
-Need accurate weighing/reporting by dealers

5/15: Riverhead, NY (Hotel)

Attendance:

The attendance sheet was lost related to a theft, however the recording of the hearing was not lost. Attendees included Bonnie Brady, Long Island Commercial Fishing Association; Emerson Hasbrouck (Cornell Marine Program), Byron Young (NYS Retired), and Theresa Labriola (PEW).

Comments:

Byron Young:

-Everyone should have the same reporting requirements.

-The data does not appear ready to support caps.

-Increased observer coverage needs to be considered relative to costs.

-The NEFMC, MAFMC, ASMFC, and Canadians need to work cooperatively to address RH/S throughout their distributions.

Emerson Hasbrouck: Provided information on Herring catch in Cornell's cooperative research work, which was provided in the briefing book.

-Before restrictions or caps are placed on the fisheries, need to figure out how much current catch is impacting RH/S stocks.

- Like Byron's comments, a coordinated approach is needed among the relevant management partners.

-Cornell has just received funding for developing a real-time bycatch avoidance fleet communication protocol but preliminary work suggests areas of higher RH/S catch are very dynamic.

5/16: Internet Webinar with facilitated listening station in Newport News, VA

Attendees

At Newport News:

Name	Affiliation	Address **(email, if possible)**
Beau Beasley	Press	fishutopia@comcast.net
Jerry Benson	Menhaden Coalition/CCA-VA	jb@widomaker.com
Thomas A. Miller	FORVA & FFV	millertam@verizon.net
Sharon Wilson	VMRC	sharon.wilson@mrc.virginia.gov
Chris Irby	ODU	chris@terrascapes.org
Terra Pascarosa	Sierra Club	terrabsp@gmail.com
Katarina Bezekova	TerraScapes	katarina@terrascapes.org
Eric Brittle	DGIF	eric.brittle@dgif.virginia.gov
Alex Bailey		alexbailey815@gmail.gov
Mark Nesius	Kneeland Nesius	knesius@odu.edu
Ben Duff	Fisherman	orangeruffey@gmail.com

On the Internet:

Name	Affiliation	Address **(email, if possible)**
O'Reilly, Rob	VMRC	rob.oreilly@mrc.virginia....
Wynne, Bennett	NCW	bennett.wynne@ncwildlife....
Kaelin, Jeff	Lunds	jkaelin@lundsfish.com
Taylor, Kate	ASMFC	ktaylor@asmfc.org
Bowden, Alison	TNC	abowden@tnc.org
Shelton, James		james_shelton32@yahoo.com...
Cevoli, Kristen	Pew	kcevoli@pewtrusts.org

Comments

Internet Comments (all from Shelton, James):

-I recommend a scientific approach that is verifiable and effective.
-Council needs to determine a safe amount that can be taken that still allows River Herring and Shad to Rebound. Also recommended:
-From Alternative 3 paired observations are needed to make a valid count.
-From Alternative 4 100% coverage mid water and small mesh to get an accurate count of by catch.
-From Alternative 6 - RH/S cap mortality cap must be observed and that catch ended at the point.
-I suggest that Fish Trawlers might adopt the Sustainable Fisheries ByCatch Avoidance as a way of meeting the Catch limit and still getting their target species.

Comments from Individuals in Newport News:

Jerry Benson:
-Have concern about trawlers impact on RH/S and depletion of forage is endangering ecosystems
-Recent Lenfest Forage Report supports protecting RH/S
-Council should create management controls on the mackerel and squid fisheries to help reverse decline of forage in Mid-Atlantic

Thomas A. Miller (Speaking on behalf of the Friends of the Rivers of Virginia, and Float Fishermen of Virginia):
-Coastal Communities have been working on restoring RH/S
-Incidental catch of RH/S in mackerel and squid fisheries is largely unmonitored and unregulated
-Create comprehensive monitoring and accountability/oversight for the industrial trawl fleet
-Choose options with the best effect toward restoring RH/S
-Recommend a catch cap that can not be circumvented by choice of trip declarations
-Recommend 100% monitoring of MWT
-Recommend discouraging slippage so that all catch is available for observers for sampling
-Recommend weighing all catch

Eric Brittle:
-Professionally, VA is more than happy to increase communication and assist in data exchange
-Personally, recommend addition of RH/S as stocks in the fishery

Chris Irby:
-Recommend addition of RH/S as stocks in the fishery to improve conservation
  -Need federal management…states already managing
-Trawlers are not leaving fish for local fishing

Terra Pascarosa (Chair of Chesapeake Bay Group Sierra Club):
-Recommend addition of RH/S as stocks in the fishery
-Recommend a cap (Alts 6)
-Recommend 100% observer coverage on trawl trips
-Recommend weighing all catch

Katarina Bezekova:
-Need to protect small fish so we can catch more big fish
-Recommend addition of RH/S as stocks in the fishery
-Recommend a cap (Alts 6)
-Recommend observers on both trawlers for pair MWT
-Recommend 100% coverage on MWT
-Recommend weighing all catch

Alex Bailey:
-There shouldn't be any bycatch if you don't have a permit. Adding RH/S as stocks in the fishery should help the bay and rivers.

Ben Duff:
-Urge addition of RH/S as stocks in the fishery

5/17: Cape May, NJ (Hotel)

Attendance:

Name	Affiliation	Address **(email, if possible)**
Patty Doerr	TNC	pdoerr@tnc.org
Sonia Rite	PEW	
Kristen Cevoil	PEW	kcevoli@pewtrusts.org
Fred Akers	*Great Egg* Harbor Watershed Association	fred_akers@gehwa.org
Stephaine Cash		cashrs@comcast.net
John Conneely		JJConneely@live.com
Stefan Axelsson		
Jeff Kaelin	Lunds	jkaelin@lundsfish.com

Comments:

Can you look at which vessels are responsible for most bycatch?

Jeff Kaelin: Lund's will be submitting detailed comments. Jeff Kaelin read a 1 page comment, which was included in the briefing book for the June 2012 Council meeting (other Lunds' employees signed this letter as well to provide their input. Jeff also recognized TNC for supporting the SMAST project. Jeff also thought that looking at if a few vessels are causing the most RH/S problems is a good idea.

Fred Akers: Submitted written comments on behalf of *Great Egg* Harbor Watershed Association, which were included in the briefing book for the June 2012 Council meeting. Generally hopes better management will avoid RH from having to get listed with ESA.

5/21: Gloucester, MA (at Mass DMF Annisquam River Marine Fisheries Field Station)

Attendance:

Name	Affiliation	Address **(email, if possible)**
Theresa Labriola	PEW	tlabriola@pewtrusts.org
Katharine Deuel	PEW	kdeuel@pewtrusts.org
Erica Fuller	Earth Justice	efuller@earthjustic.org
Greg Wells		
Ben Gahogan		ben.gahagan@state.ma.us

Comments:

Erica Fuller on behalf of Herring Alliance

-RH/S are at historic lows and in dire need of conservation and management in federal waters
-MAFMC has the obligation to protect and conserve these depleted stocks
MAFMC should choose:
-RH/S should be added as stocks in the fishery.
-New England's rejection of RH as stocks in the fishery was recently found to be unlawful
-Section 302 of the Magnuson Act requires an FMP for any stock capable of being managed in a unit and in need of conservation and management.
-Overfishing and current designation as stocks in the fishery are not the only triggers whether a stock should be a stock in the fishery and NMFS must review and provide justification for any decision
-RH/S are caught, sold, and/or discarded in MSB fisheries
RH stock assessment and consideration of listing shows RH/S are in need of management
-You should add RH/S as stocks in the fishery
-Herring Alliance supports a modified catch cap as an interim measure that shuts mackerel fishing by lowering the amount of mackerel that can be fished for, possessed, or retained. We support alternatives 6b and 6c.
-We support 5b4 and 3d to place observers on all mid-water trawl fishing vessels
-We support accountability measures to discourage slippage, including operational discards (3j with operational discards prohibited). If dumping is allowed, provide for a fleet wide limit of 10 dumping events and require vessels that dump to take an observer on their next trip. 3l, 3n, 3o.
-We support a requirement to weigh all catch, alternatives 2c-2f.

5/22: Warwick, RI (immediately after Amendment 14/Amendment 5 joint technical meeting)

Attendance:

Name	Affiliation	Address **(email, if possible)**
Eric Reid	Deep Sea Fish	eric@deepseafish.net
Geir Monsen	Seafreeze	geir@seafreezeltd.com
Kristen Cevoli	PEW	kcevoli@pewtrust.org
Jud Crawford	*PEW*	jcrawford@pewtrust.org
Pam Lyons Gromen	NCMC	conservac@yahoo.com

Comments:

Geir Monsen:
-If you are going to develop a fishery management plan for RH/S you are going to have to develop a few thousand because each river & creek is its own stock and you will have to have a plan for each river.
-There is no information on how much can be taken out of all the rivers
-Water quality has improved in recent decades that should result in better recruitment
-These are feel good actions and you have no clue about what they are going to do
-For the most part there is an incentive to avoid river herring because zoos and aquariums do not want river herring mixed into marine mammal food.
-Seafreeze sorts all fish and has been catching very little.
-Since no one wants to get river herring, a lot of that the Amendment considers is already in place.
-Cormorants are targeting RH at river mouths in the fall, far surpassing commercial fishing mortality.

Ray Kane:
-Has there been tagging of River Herring? I think you should consider a 25-miles buffer zone from the coast out (entire coast). Maine and New Hampshire use buffers (40 mile). Small triggered hotspots will not work.

Pam Lyons Gromen:
-Request that for upcoming meetings, that they be provided an update of the river herring stock assessment, which found them to be depleted to historic lows

Jud Crawford on behalf of Pew Environment Group:
-There are caps on salmon on the west coast that are not river specific.
-MAFMC has an opportunity to take a leadership role with regard to stocks in the fishery
-The Amendment 4 lawsuit suggests stock in the fishery designation is required
-Amendment 14 should be able to officially add RH/S as stocks in a fishery and then implement measures later.
-Want better monitoring of both directed landings and bycatch
-Mixed nature of fisheries must be addressed and not used as an excuse to do nothing
-Recommend designating RH/S as stocks in the fishery and initiate a follow-up amendment to implement associate required measures
-See other measures, in particular a catch cap as a good interim measure (Alt Set 6), especially matched with 100% observer coverage on the larger scale small mesh midwater fishery as a condition for access
-If a cap is implemented, make the mackerel possession limit very low to address cap pitfalls identified in the EIS
-The costs for observer coverage can be brought down in half as is being done in other fisheries.
-Allow frameworking of protection areas as well as a increases in size of those areas.

Eric Reid, on behalf of Deep Sea Fish, RI:
-RH/S face major habitat impediments and this should be the focus of recovery efforts
-$800/day would be a tremendous financial burden
-A variety of state-level of efforts are underway
-Commercial fishermen are being blamed which there are other culprits
-Urge no action on all alternatives
-The DEIS is insanely long.

Appendix 11 - **Supplemental reference documents and communications, including letters from NMFS to the MAFMC and NEFMC on Amendments 14 and 5.**

Amendment 14 Reference Supplement

Updated 6/11/12

The materials in this document were received or requested after the Council Briefing Book mail-out. An Index Follows:

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

JUN - 5 2012

Richard B. Robins, Jr., Chairman
Mid-Atlantic Fishery Management Council
Suite 201
800 State Street
Dover, DE 19901

Dear Rick:

We have reviewed the Draft Environmental Impact Statement (DEIS) for Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) and have evaluated the potential effectiveness and feasibility of alternatives under consideration. The Mid-Atlantic Fishery Management Council (Council) has spent a substantial amount of time developing this amendment, and there are many alternatives that offer clear improvements to the MSB FMP and can be implemented by the NOAA Fisheries Service.

We support the consideration of the following alternatives in Amendment 14:

- Expanding the requirement for weekly vessel trip reports (VTRs) to all MSB permits (Alternative 1c), consistent with reporting requirements for other Northeast Region permits;
- Expanding vessel requirements related to at-sea sampling (Alternatives 3b and 3c) to help ensure safe sampling and improve data quality;
- Establishing a river herring catch cap (Alternative 6b) to directly control river herring fishing mortality;
- Requiring 48-hour pre-trip notifications for directed mackerel trips (Alternative 1d48) and vessel monitoring systems (VMS) (Alternative 1eMack) to help facilitate monitoring and compliance for a river herring catch cap;
- Requiring daily VMS catch reports (Alternative 1fMack), which are currently required for the Atlantic herring fishery, should the New England Fishery Management Council choose to implement a companion river herring catch cap for the Atlantic herring fishery;
- Allowing the joint Sustainable Fisheries Coalition/University of Massachusetts School for Marine Science and Technology/Massachusetts Department of Marine Fisheries bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters (Alternative 4f).

Several issues that are considered in Amendment 14 have been the subject of much debate and public comment. These issues include: Increasing observer coverage; addressing net slippage; improving dealer data; and addressing river herring bycatch. NOAA Fisheries Service supports improvements to fishery dependent data collections, be it through expansion of monitoring at sea, or greater quality assurance of the dealer data. We also share the Council's concern for reducing bycatch and unnecessary discards, and appreciate the Council's work on addressing these issues.

However, some specific alternatives in Amendment 14, if adopted, would require still more thought, more robust rationale, and further justification by the Council. As we have commented previously,

we share the Council's desire/need to have better data about these fisheries, and we support the motive and concept of the alternatives that aim to do this. However, we must be mindful of the burden and technical details of implementing the alternatives. Additionally, we cannot give our full support for alternatives for which the agency is not likely to have sufficient resources to execute.

The following sections detail our concerns with the specified alternatives. I have noted in this section which alternatives we believe require further justification by the Council, and those that we believe have serious implementation issues that we cannot overcome.

Vessel Reporting Measures (Alternative Set 1)
We are generally supportive of the vessel reporting alternatives that are necessary to ensure the effectiveness and feasibility of the programs the Council selects in this Amendment. We urge the Council to weigh each program proposed in Amendment 14 in its entirety and consider how the program will be administered and monitored moving forward.

Dealer Reporting Measures (Alternative Set 2)
Dealers are currently required to report the weight of purchased fish. A variety of methods are used by dealers to determine the weight of fish, including weighing fish on scales and estimating weight based on volumetric measures. Without verification of scale accuracy and readouts, alternatives that require dealers to weigh all fishing using a scale (Alternatives 2c-2f) may not provide substantial enough improvements to data to justify the cost. Because Alternative 2g allows dealers to continue using scales and/or volumetric estimates to determine the weight of fish, there is no appreciable difference between Alternative 2g and status quo.

Alternatives 2c-2f require dealers to document how they estimate the relative composition of mixed catch in order to facilitate quota monitoring. However, this qualitative information cannot be incorporated into quota monitoring because we use the weights provided by the dealers, regardless of the methods used to determine weights. Additionally, we are unable to evaluate, either annually or for individual transactions, the sufficiency of the information submitted.

Alternative 2b requires vessel owners/operators to review and validate catch data for their vessels in Fish-On-Line. This alternative has the potential to improve quota monitoring and year-end catch determinations by highlighting data reporting issues. However, vessels are currently able to review both vessel and dealer reported data via Fish-On-Line and discover data issues. The Council should consider whether the utility of Alternative 2b outweighs the additional reporting and administrative burden associated with the requirement.

The Council should also be aware that, if these any of these alternatives are made mandatory, they would become compliance measures that would affect future vessel permit issuance (similar to VTR and VMS compliance).

At-Sea Observation Optimization Measures (Alternative Set 3)
I am concerned about the effectiveness and legal justification for the alternatives designed to reduce slippage events in the mackerel and longfin squid fisheries. Alternatives that require trip termination lack a well explained basis for the threshold to trigger trip termination (i.e., Alternatives 3k-3n, either 5 or 10 slippage events per season or trimester). The trip termination triggers require a clear and supportable rationale and justification. Once the threshold to trigger trip termination has been reached, all vessels that slip catch, regardless of the reason for slipping (including safety or

mechanical failure), would be required to return to port. The Council must provide sufficient rationale for requiring vessels to terminate a trip after the trigger while allowing the specified number of slippage events prior to the trigger without consequence. Further, trip termination alternatives may create the situation of the vessel operator having to choose between trip termination or bringing catch aboard the vessel despite a safety concern or mechanical failure. Such a provision must be consistent with National Standard 10 of the Magnuson-Stevens Fishery Conservation and Management Act and requires additional detailed explanation from the Council. For NOAA Fisheries Service to approve a measure like this, the Council must provide a rational basis that we can support in relation to requirements of the Magnuson-Stevens Act, the Administrative Procedure Act, and other applicable law.

Additionally, we are concerned that slippage requirements are triggered when an observer is aboard the vessel. Requirements for a vessel to terminate a trip should not depend on the presence of an observer. NOAA Fisheries Service acknowledges that observes are helpful when evaluating compliance with slippage requirements, but implementing requirements contingent on the presence of an observer unduly places the observer in a compliance/enforcement role and creates the potential for conflict between the vessel's crew and the observer.

We also do not believe there is utility in requiring released catch affidavits for slippage events, as the affidavit will not provide any new information that is not currently reported by the observer program. We recently implemented protocols for observers to collect detailed information on discards, including slippage, in the herring and mackerel fisheries, such as why catch was discarded, the estimated amount of discarded catch, and estimated composition of discarded catch. Given this new data collection, requiring vessel operators to complete a slipped catch affidavit whenever catch is slipped and an observer is aboard is an unnecessary reporting burden for the industry. As we strive to improve management of the mackerel fishery, observer data, both on discards and slipped catch, are the best information to understand and account for discarding.

Port-side and Other Sampling/Monitoring Measures (Alternative Set 4)
NMFS agrees that while at-sea observers are essential for monitoring river herring and shad discards, port-side sampling is an efficient, cost-effective way to enhance the characterization of retained river herring and shad catch. Though Amendment 14 proposes industry funding to cover the port-side sampling, we estimate the cost to implement the infrastructure component of a port-side sampling program to be significant. Unfortunately, we do not have the available resources to administer the infrastructure components of this new program, given our budgetary constraints.

At-Sea Observer Coverage Requirements (Alternative Set 5)
Amendment 14 includes alternatives that increase the level of observer coverage in the mackerel and longfin squid fisheries using NOAA Fisheries Service or industry funds to support the additional coverage. While we share the Council's interested in improving fishery dependent data quality, our current and anticipated budgets do not provide support for expanded levels of observer coverage. The available funds must be distributed for observers in all of our Northeast fisheries, and we are under pressure to increase coverage levels in all fisheries. We simply cannot afford to support any alternatives that increase the observer coverage level in the mackerel or longfin squid fisheries under agency funding. We acknowledge that the analysis in the Amendment 14 document demonstrates that an industry-funded observer program would put substantial financial burden on the mackerel and longfin squid industries. If the Council proceeds with an industry funded option, it must carefully weigh the benefits of such a program with the costs to the industry.

Alternatives to Address River Herring/Shad Bycatch and Catch (Alternative Sets 6-8)
Analyses in the DEISs for MSB Amendment 14 and the New England Fishery Management Council's Amendment 5 to the Atlantic Herring Fishery Management Plan (Herring FMP) suggest that time/area management alternatives considered in Amendment 14 are unlikely to effectively minimize the bycatch of river herring due to the variable distribution of river herring. Analyses in Amendment 14 suggest that time/area management for river herring would require the use of large areas to ensure that time/area management was not just redistributing fishing effort, possibly in a way that increased river herring catch. Maps of Northeast Fisheries Science Center spring and fall survey catches indicate that the seasonal and inter-annual distribution of river herring is highly variable in time and space. River herring distribution is highly variable because they undergo extensive coast-wide migrations, largely influenced by water temperature. In addition, the incidental catch of river herring/shad and effort pattern of fleets encountering river herring/shad (i.e., midwater trawl, small-mesh bottom trawl) are also highly variable in time and space because those fleets target species that are highly migratory (e.g., herring, mackerel, squid, whiting).

To address our concerns about time/area closures, a river herring catch cap would be the most effective alternative in Amendment 14 at controlling the catch of river herring. Further, due to the mixed nature of the Atlantic herring and mackerel fisheries, especially during January through April in Atlantic Herring Management Area 2, the potential for the greatest river herring catch reduction would come from the implementation of a joint river herring catch cap for both the Atlantic herring and mackerel fisheries. A catch cap has the potential to directly control river herring fishing mortality with less compliance and administrative burden than time/area management.

In addition, the Council should carefully consider whether the benefits of river herring catch cap for the longfin squid fishery, or a shad cap for the mackerel or longfin squid fishery, outweigh the costs, especially given the scale of shad catch (125,000 lb per year, 2006-2010) compared to river herring catch (1,000,000 lb per year, 2006-2010), and the relative contribution of Mid-Atlantic small-mesh bottom trawl fisheries to total river herring and shad mortality (5% and 11.5% of total mortality, respectively).

Addition of River Herring/Shad as "Stocks in the Fishery" in the MSB FMP (Alternative Set 9)

The DEIS for Amendment 14 includes alternatives that would initiate Council action to consider adding, in a future action, alewife, blueback, American shad, and/or hickory shad as stocks in the MSB FMP (Alternative Set 9). These alternatives are not true alternatives under NEPA because they do not result in any NOAA Fisheries Service action. Rather, they would initiate a future Council amendment that would consider and analyze various management reference points, to describe and delineate EFH, and to prescribe appropriate conservation management objectives and measures. If the Council determines that it should consider adding alewife, blueback, American shad, and/or hickory shad as stocks in the MSB FMP, consistent with Alternative Set 9, we advise that the Council should initiate an amendment in a motion at the June Council meeting. My staff can communicate with your staff regarding any necessary adjustments to the final environmental impact statement (FEIS) to reflect this course of action.

Should the Council choose to initiate an amendment to consider adding river herring/shad as stocks in the MSB FMP, we urge you to work collaboratively with the New England Fishery Management

Council to develop options for potential management programs. Both the herring and MSB species interact with river herring and shad, and a management program would need to include consideration of interactions across both FMPs. In addition, there can only be one lead Council for the river herring/shad species. The recommendation as to which Council will take the lead on a river herring/shad FMP should be included in your joint deliberations.

In summary, I urge the Council to select alternatives that effectively monitor and minimize bycatch in the mackerel and longfin squid fisheries, and do not significantly expand the compliance and administrative burden of these fisheries, without a commensurate benefit to data quality. Alternatives in Amendment 14 have complimentary alternatives in the Amendment 5 to the Atlantic Herring FMP. Given the significant overlap between the Atlantic herring and mackerel fisheries, we urge both Councils to select similar alternatives regarding monitoring and addressing river herring/shad bycatch.

Finally, various reviewers noted technical issues with the draft environmental impact statement that will need to be addressed in the FEIS. My staff will provide those comments directly to Council staff. I appreciate the time and effort that the Council and Council staff have put into this amendment and I look forward to working with the Council to complete this action.

Sincerely,

Daniel S. Morris
Acting Regional Administrator

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

JUN - 5 2012

C.M. "Rip" Cunningham, Jr., Chairman
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Rip:

We have reviewed the Draft Environmental Impact Statement (DEIS) for Amendment 5 to the Atlantic Herring Fishery Management Plan (Herring FMP) and have evaluated the potential effectiveness and feasibility of the alternatives under consideration. The New England Fishery Management Council (Council) has spent years developing this amendment, and there are many alternatives that offer clear improvements to the Herring FMP and can be implemented by NOAA Fisheries Service.

We support the consideration of the following alternatives in Amendment 5:

- Modifying the herring transfer at-sea and offload definitions to better document the transfer of fish;
- Expanding the possession limit restrictions to all vessels working cooperatively, consistent with requirements for pair trawl requirements;
- Eliminating the vessel monitoring system (VMS) power down provision for limited access herring vessels, consistent with VMS provisions for other fisheries;
- Establishing an "At-Sea Herring Dealer" permit to better document the transfer and purchase of herring;
- Allowing vessels to enroll as herring carriers with either a VMS declaration or letter of authorization;
- Expanding pre-trip and pre-landing notification requirements, as well as adding a VMS gear declaration, to all limited access herring vessels to help facilitate monitoring;
- Reducing the advance notice requirement for the pre-trip notification from 72 hours to 48 hours;
- Expanding vessel requirements related to at-sea sampling to help ensure safe sampling and improve data quality;
- Establishing a river herring catch cap in a future framework to directly control river herring fishing mortality; and
- Allowing the joint Sustainable Fisheries Coalition/University of Massachusetts School for Marine Science and Technology/Massachusetts Department of Marine Fisheries bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters.

Several issues that are considered in Amendment 5 have been the subject of much debate and public comment. These issues include: Increasing observer coverage; addressing net slippage;

improving dealer data; addressing river herring bycatch; and addressing midwater trawling in groundfish closed areas. NOAA Fisheries Service supports improvements to fishery dependent data collections, be it through expansion of monitoring at sea or greater quality assurance of the dealer data. We also share the Council's concern for reducing bycatch and unnecessary discarding, and appreciate the Council's work on addressing these issues.

However, some specific alternatives in Amendment 5, if adopted, would require still more thought, more robust rationale, and further justification by the Council. As we have commented previously, we share the Council's desire/need to have better data about the fishery, and we support the motive and concept of the alternatives that aim to do this. However, we must be mindful of the burden and technical details of implementing the alternatives. Additionally, we cannot give our full support for alternatives for which the agency is not likely to have sufficient resources to execute.

The following sections detail our concerns with the specified alternatives. I have noted in this section which alternatives we believe require further justification by the Council and those that we believe have serious implementation issues that we cannot overcome.

Alternatives to Allocate Observer Coverage

Amendment 5 includes alternatives that increase the level of observer coverage in the herring fishery using NOAA Fisheries Service or industry funds to support the additional coverage. While we share the Council's interest in improving fishery-dependent data, our current and anticipated budgets do not provide support for expanded levels of observer coverage. The available funds must be distributed for observers in all of our Northeast fisheries, and we are under increasing pressure to increase observer coverage in all fisheries. We simply cannot afford to support any alternatives that increase the observer coverage level in the herring fishery under agency funding. We acknowledge that the analysis in Amendment 5 demonstrates that an industry-funded observer program would put substantial financial burden on the herring industry. If the Council proceeds with an industry-funded observer program, it must carefully weigh the benefits of such a program against the costs to the industry.

Under the industry-funded observer program alternative, Amendment 5 contains a Sub-Option that would exempt states from observer service provider requirements. To ensure data quality standards, we believe that all observer service providers should be held to the same requirements. The requirements include such things as standards of conduct, reporting requirements, conflict of interest statements, and emergency action plans. I therefore recommend that the Council adopt the alternative that requires states to comply with all observer service provider requirements.

Alternatives to Address River Herring Bycatch

Analyses in the DEISs for Herring Amendment 5 and the Mid-Atlantic Fishery Management Council's Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish FMP (MSB FMP) suggest that time/area management alternatives considered in Amendment 5 are unlikely to effectively minimize the bycatch of river herring due to the variable distribution of river herring. Analyses in Amendment 14 suggest that time/area management for river herring would require the use of large areas to ensure that time/area management was not just redistributing fishing effort, possibly in a way that increased river herring catch. Maps of Northeast Fisheries Science

Center spring and fall survey catches indicate that the seasonal and inter-annual distribution of river herring is highly variable in time and space. River herring distribution is highly variable because river herring undergo extensive coast-wide migrations, largely influenced by water temperature. In addition, the incidental catch of river herring and effort pattern of fleets encountering river herring (i.e., midwater trawl, small-mesh bottom trawl) are also highly variable in time and space because those fleets target species that are highly migratory (e.g., herring, mackerel, squid, whiting).

To address our concern about time/area management, a river herring catch cap, implemented through a future framework, would be the most effective alternative in Amendment 5 at controlling the catch of river herring. Further, due to the mixed nature of the herring and mackerel fisheries, especially during January through April in Herring Management Area 2, 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. A catch cap has the potential to directly control river herring fishing mortality with less compliance and administrative burden than time/area management.

Alternatives to Address Net Slippage

I am concerned about the effectiveness and legal justification for the alternatives designed to reduce slippage events in the herring fishery. Alternatives that require trip termination and/or catch deduction lack a well explained basis for the threshold to trigger trip termination (i.e., either 5 or 10 slippage events in a management area) and the amount of catch deduction (i.e., 100,000 lb). Both the termination trigger and the catch deduction require clear and supportable rationale and justification. Once the threshold to trigger trip termination has been reached, all vessels that slip catch, regardless of the reason for slipping (including safety or mechanical failure), would be required to return to port. The Council must provide sufficient rationale for requiring vessels to terminate a trip after the trigger while allowing the specified number of slippage events prior to the trigger without consequence. Further, the trip termination alternatives may create the situation of the vessel operator having to choose between trip termination or bringing catch aboard the vessel despite a safety concern or mechanical failure. Such a provision must be consistent with National Standard 10 of the Magnuson-Stevens Fishery Conservation and Management Act and requires additional detailed explanation from the Council. For NOAA Fisheries Service to approve a measure like this, the Council must provide a rational basis that we can support in relation to requirements of the Magnuson-Stevens Act, the Administrative Procedure Act, and other applicable law. Additionally, we are concerned that slippage requirements are triggered when an observer is aboard the vessel. Requirements for a vessel to terminate a trip or report a slippage deduction (i.e., 100,000 lb) should not depend on the presence of an observer. NOAA Fisheries Service acknowledges that observers are helpful when evaluating compliance with slippage requirements, but implementing requirements contingent on the presence of an observer unduly places the observer in a compliance/enforcement role and creates the potential for conflict between the vessel's crew and the observer.

We also do not believe there is utility in requiring released catch affidavits for slippage events, as the affidavit will not provide any new information that is not currently collected by NEFOP. NEFOP recently implemented protocols for observers to collect detailed information on discard,

including slippage, in the herring and mackerel fisheries, such as why catch was discarded, the estimated amount of discarded catch, and estimated composition of discarded catch. For 2010, NOAA Fisheries Service determined the amount of discards in the herring fishery by extrapolating observer data to the entire herring fishery. The amount of observed herring discards ("Atlantic herring" and "herring not known") was divided by the amount of observed fish landed. That discard ratio was then multiplied by the amount of all fish landed for each trip to calculate total amount of herring discards in 2010. The amount of discards was determined for each management area and gear type. Given this new data collection, requiring vessel operators to complete a slipped catch affidavit whenever catch is slipped and an observer is aboard is an unnecessary reporting burden for the industry. As we strive to improve management of the herring fishery, observer data, both on discards and slipped catch, are the best information to understand and account for discarding.

Reporting Requirements for Dealers
Dealers are currently required to report the weight of purchased fish. A variety of methods are used by dealers to determine the weight of fish, including weighing fish on scales and estimating weights, based on volumetric measures. Because Option 2 allows dealers to continue using scales and/or volumetric estimates to determine the weight of fish, there is no appreciable difference between Option 2 and status quo.

Sub-Options 2A and 2B require dealers to document how they estimate the relative composition of mixed catch in order to facilitate quota monitoring. However, this qualitative information cannot be incorporated into quota monitoring because we use the weights provided by the dealers, regardless of the methods used to determine weights. Additionally, we are unable to evaluate, either annually or for individual transactions, the sufficiency of the information submitted.

Sub-Option 2C requires vessel owners/operators to review and validate catch data for their vessels in Fish-On-Line. This Sub-Option has the potential to improve quota monitoring and year-end catch determinations by highlighting data reporting issues. However, vessels are currently able to review both vessel and dealer reported data via Fish-On-Line and discover data issues. The Council should consider whether the utility of Sub-Option 2C outweighs the additional reporting and administrative burden associated with the requirement.

The Council should also be aware that if any of these Sub-Options become requirements, they would also become compliance measures that would affect future vessel permit issuance (similar to vessel trip report and VMS compliance).

Alternatives to Address Midwater Trawl Access to Groundfish Closed Areas
Amendment 5 considers an alternative that would prohibit midwater trawling in groundfish closed areas, unless the vessel has an experimental fishing permit. Analyzes in the DEIS 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 bycatch by midwater trawl vessels is haddock, and the catch of haddock by midwater trawl vessels is already managed through a haddock catch cap. The data do not indicate that prohibiting midwater trawling in groundfish closed areas is necessary for groundfish conservation.

In summary, I urge the Council to select alternatives that effectively monitor herring, minimize bycatch in the herring fishery, and do not significantly expand the compliance and administrative burden of the herring fishery without a commensurate benefit to data quality. Alternatives in Amendment 5 have complimentary alternatives in the Amendment 14 to the MSB FMP. Given the significant overlap between the herring and mackerel fisheries, I also encourage the Council to consider the recommendations by the Mid-Atlantic Fishery Management Council on Amendment 14 to the MSB FMP when recommending monitoring and bycatch measures for Amendment 5.

Finally, various reviewers noted technical issues with the DEIS that will need to be addressed in the final EIS. My staff will provide those comments directly to Council staff. I appreciate the time and effort that the Council and Council staff have put into this amendment and I look forward to working with the Council to complete this action.

Sincerely,

Daniel S. Morris
Acting Regional Administrator

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*

HERRING COMMITTEE MOTIONS

Herring Committee Meeting

Radisson Hotel, Plymouth MA

June 6, 2012

CATCH MONITORING AT-SEA

(PINK SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT)

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

1. Recommend to the Council as a preferred alternative for Section 3.2.1 Alternative 2, 100% coverage on Category A and B and C herring vessels, coupled with the Herring AP recommendation for Funding Option 2 – Federal and Industry Funds– with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the States as service providers

   MOTION CARRIED 7-3-1.

2. Move that a waiver for an at-sea observer be granted for a fishing trip if NEFOP cannot provide an observer within 24 hours of the vessel's notification of the prospective trip. A waiver will not be granted if the trip is to include tows in areas and at times associated with measures to avoid or protect river herring

   MOTION CARRIED 9-0-1.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.2 – Measures to Improve/Maximize Sampling At-Sea)

3. That the Committee recommend as a preferred alternative, Section 3.2.2, Option 2, Sub-Options 2A-2F, p. 30 of the public hearing document

   MOTION CARRIED 9-0-1.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.3 – Measures to Address Net Slippage)

4. That for Section 3.2.3, Measures to Address Net Slippage the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions Trip Termination after ten slippage events by each gear type – midwater trawl (single and paired), purse seine, and bottom trawl (with an added exception for slippage under #3 spiny dogfish clogging the pump for all gear types).

   Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.

   MOTION CARRIED 7-1-2.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.4 – Maximized Retention Alternative)

5. That the Committee recommend as a preferred alternative, Section 3.2.4, Option 1 – No Action

   MOTION CARRIED 9-1-1.

PROPOSED ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM (BLUE SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

6. Recommend that the Council adopt Section 3.3.1B – Proposed Regulatory Definitions

   MOTION CARRIED 10-0-1.

7. Recommend as a preferred alternative Section 3.1.2B – Proposed Administrative/General Provisions – Including 2A, 2B, and 2C

   MOTION CARRIED 10-0-1.

8. Recommend as a preferred alternative Section 3.1.3.2 Option 3 – Dual Option for Carriers (VMS or LOA)

   MOTION CARRIED 10-0-1.

9. Recommend as a preferred alternative Section 3.1.3.3 Option 3 – Prohibit Transfers At Sea to Non-Permitted Vessels

   MOTION CARRIED 9-1-0.

10. Recommend as a preferred alternative Section 3.1.4 Option 2 – Modify and Extend Pre-Trip Notification Requirements AND in Section 3.1.4, Option 3 – Extend Pre-Landing Notification Requirement

    MOTION CARRIED UNANIMOUSLY.

11. Recommend as a preferred alternative Section 3.1.5 Option 2 with Sub-Option 2B – require dealers to accurately weigh all fish and require documentation for individual landings submissions on how species composition of mixed catch is estimated.

    MOTION CARRIED UNANIMOUSLY.

12. Recommend as a preferred alternative Section 3.1.6 Option 2 for Limited Access Mackerel permit holders (all three tiers) – 20,000 pound possession limit in Areas 2/3 for vessels that also possess a limited access mackerel permit, and that the possession limit could be adjusted in the future through the specifications process

    MOTION CARRIED UNANIMOUSLY.

13. To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next fishing trip unless there is confirmation by an observer or enforcement of weight on board that will be offloaded at the time of the next landing event.

    MOTION CARRIED 6-1-2.

MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH (GREEN SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

14. Recommend Section 3.3.5 on p. 59 of the public hearing document for a river herring catch cap, which the Council would consider through a framework adjustment

    MOTION CARRIED 6-0-3.

15. To recommend as a preferred alternative to address river herring bycatch Alternative 2, Option 4 – Two-Phase Bycatch Avoidance Approach based on SMAST/SFC Project.

    MOTION CARRIED UNANIMOUSLY.

MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

(PURPLE SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

16. Recommend Alternative 4, Option 4A for midwater trawl access to groundfish closed areas – Apply Closed Area I Provisions with 100% Observer Coverage, to all current year-round closed areas.

    MOTION CARRIED 9-1-0.

HERRING AMENDMENT 5 COMMITTEE MEETING

DRAFT MOTIONS 6-6-12

Catch Monitoring Alternatives:

MOTION Terry Stockwell/Mary Beth Tooley: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry.

MOTION AMENDED: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, **and Option 2 to authorize the states as service providers.**

MOTION TO AMEND: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B **and C** herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the states as service providers. MOTION TO AMEND: 6, 4, 1 abstention: motion passes.

MOTION: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B and C herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the states as service providers. MOTION: 7, 3, 1 in favor. MOTION CARRIES

MOTION: Dave Pierce/Terry Stockwell Move that a waiver for an at sea observer be granted for a fishing trip if NEFOP cannot provide an observer within 24 hours of the vessel's notification of the prospective trip. A waiver will not be granted if the trip is to include tows in areas and at times associated with measures to avoid or protect river herring. MOTION: 9, 0, 1 Motion Passes (Berg missing)

MOTION: Mary Beth Tooley/Terry Stockwell. That the committee recommend as a preferred alternative, Section 3.2.2, Option 2, Sub-Options 2A through 2F, measures to improve sampling. Motion carried 9-0-1.

MOTION: Mary Beth Tooley/Terry Stockwell. That the Committee recommend as a preferred alternative, Section 3.2.4, Alternative 1 (No Action) MOTION CARRIES 9, 1, 1.

Measures to Address Net Slippage 3.2.3

MOTION: Dave Pierce/Glen Libby. Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4B Closed Area I Provisions with Catch Deduction (100,000 pounds) and Trip Termination after ten slippage events.

MOTION TO SUBSTITUTE: Terry Stockwell/?. Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions and Trip Termination after ten slippage events by each gear type (midwater trawl single, midwater trawl paired, purse seine, bottom trawl (with an added exception for #3 spiny dogfish clogging the pump). *Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.*

MOTION: Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions and Trip Termination after ten slippage events by each gear type (single and paired midwater trawl, purse seine, bottom trawl (with an added exception for #3 spiny dogfish clogging the pump). *Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.* Motion CARRIES 7, 1, 2.

Section 3.3.3.1 Regulatory Definitions

MOTION: Dave Pierce/Terry Stockwell. Recommend that the Council adopt Section 3.3.1B Proposed regulatory Definitions . Motion Carries 10, 0, 1.

MOTION: Terry Stockwell/Mary Beth Tooley: Recommend as a preferred alternative Section 3.1.2.B Proposed Administrative/General Provisions Including 2A, 2B, and 2C. Motion Carries 10, 0, 1

MOTION: Mary Beth Tooley/Terry Stockwell: Recommends as a preferred alternative Section 3.1.3.2.3 Option 3 Dual Option for Carrieres (VMS or LOA). Motion Carries 10, 0, 1

MOTION: Mary Beth Tooley/Erling Berg: Recommend as a preferred alternative Section 3.1.3.3 Option 3 Prohibits transfers at sea to non-permitted vessels.

MOTION To Substitute: Dave Pierce./Peter Kendall: Recommend as preferred alternative Section 3.1.3.3 Option 1-No Action Motion Fails 2, 8, 0

MOTION Mary Beth Tooley/Erling Berg: Recommend as a preferred alternative Section 3.1.3.3 Option 3 Prohibits transfers at sea to non-permitted vessels. Motion carries 9, 1, 0

3.1.4 Trip Notification Requirements

MOTION MBT/Erling Berg: Recommend as a preferred alternative Section 3.1.4 Option 2 to modify and extend the pre-trip notification requirements and 3.1.4 Option 3 to extend the pre-landing notification requirements. Motion carries unanimously**.**

3.1.5 Dealer Reporting Requirements

MOTION Terry Stockwell/Mary Beth Tooley : Recommend as a preferred alternative Section 3.1.5 Option 2 with sub-Option 2B to require dealers to accurately weigh all fish and require documentation for individual landings submissions on how species composition of mixed catch is estimated. Motion carries unanimously.

MOTION Mary Beth Tooley: That Atlantic herring vessels be required to file a single VTR per trip, by statistical area, that lists any at sea transfers on that trip.

MOTION WITHDRAWN by MBT.

MOTION Terry Stockwell/Mary Beth Tooley: To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next trip.

MOTION: Dave Pierce/Peter Kendall .To table the previous motion until after the break. Motion carries unanimously.

3.1.6 Changes to Open Access Permit Provisions for the Limited Access Mackerel Fishery

MOTION Mary Beth Tooley/Erling Berg Recommends as a preferred alternative Section 3.1.6 Option 2 for the limited access mackerel permit holders (Tiers 1, 2, 3), 20,000 pound possession limit in Areas 2/3 for vessels that also possess a limited access mackerel permit and this possession limit could be adjusted in the future through the specifications process. Motion carries unanimously.

MOTION to remove the previous motion from the table. Unanimous.

TABELED MOTION RECONSIDERED AND PERFECTED To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next fishing trip unless there is confirmation by an observer or enforcement of weight on board that will be offloaded at the time of the next landing event. Motion Carried 6, 1, 2.

Measures to Address River Herring Bycatch Section 3.3

MOTION Dave Pierce/Mark Gibson: That for Measures to Address River Herring Bycatch the committee recommend:

(1) Alternative 3 River Herring Protection Section 3.3.3.2 Option 1 (Closure Areas) for the three designated ¼ degree squares north of 4130 N Latitude to be closed during the bimonthly periods described on pg. 54 of the public hearing document for Amendment 5 and
(2) Alternative 2 River Herring Monitoring/Avoidance Approach Based on SFCSMAST/DMF Project) applied to bimonthly monitoring/avoidance areas described on page 41 of the public hearing document for Amendment 5. (Except for three designated ¼ degree squares north of 4130 N Latitude where river herring protection measures apply.
(3) If the Bycatch Avoidance Approach is discontinued for any reason (e.g.funding) then the following would be implemented in its place:
    a. Alternative 3: Protection Areas Option 1 (Closed Area) only for the ¼ degree square off the eastern shore of Cape Cod from November through February and then
    b. Alternative 3 Option 2 (Trigger Based Closed Areas) Sub-option 3C (mean) for catch triggers in the GOM (127,100 lb) and Southern New England (478,500 lb) for all other designated bi-monthly closures of river herring protection areas. Reporting Option 1: Report Total Catch by Trigger Area is recommended.

MOTION FAILS 3, 7, 0

MOTION Dave P/Frank Blout: To Recommend (1) Alternative 3, River Herring Protection, Option 1 – Closed Areas for the ¼ degree square areas on the Eastern side of Cape Cod and (2) Alternative 2, River herring monitoring and avoidance, Option 4, Two Phase Bycatch Avoidance Approach based on SMAST, applied to all other bimonthly Montoring/Avoidance Areas described on page 41 of the public hearing document for Amendment 5. MOTION FAILS 3,6,1

MOTION Mary Beth Tooley/Glen Libby: To Recommend Section 3.3.5 on Pg 59 of the public hearing document for a River Herring Catch Cap which the Council would Consider through a Framework Adjustment. MOTION Carries 6,0,3.

MOTION Terry Stockwell/Peter Kendall: To Recommend as a preferred alternative, Alternative 2, Option 4, a Two Phase Bycatch Avoidance Approach based on SMAST/SFC Project. MOTION Carries Unanimously.

Section 3.4 Midwater Trawl Access to Groundfish Closed Areas

MOTION Terry Stockwell/Howard King: To recommend Alternative 4, Option 4A for midwater trawl access to groundfish closed areas. Apply Closed Area I Provisions with 100% Observer Coverage, to all of the current year round closed areas. MOTION Carries 9, 1, 0.

MOTION Mary Beth Tooley/Terry Stockwell: Recommend that the industry funded at sea observer program be developed through a work group that includes the Agency, Council, and the industry. The work group shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. This will apply to all permit categories approved for observer coverage allocations in Amendment 5.

MOTION PERFECTED (FRIENDLY) Mary Beth Tooley/Terry Stockwell: Recommend that the industry funded at sea observer program be developed through an ad hoc Committee that includes the Agency, Council, and the industry. The ad hoc Committee shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. Waivers will be issued when observers cannot be deployed during the development of the program. This will apply to all permit categories approved for observer coverage allocations in Amendment 5.

MOTION TO AMEND Peter Kendall/Frank Blount: To add: Also, waivers would not be issued for midwater trawl vessels fishing in groundfish year round closed areas (if 100% coverage is required in the closed areas). MOTION Carries 5, 3, 1

INSERTED INTO MAIN MOTION: Recommend that the industry funded at sea observer program be developed through an ad hoc Committee that includes the Agency, Council, and the industry. The ad

hoc Committee shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. Waivers will be issued when observers cannot be deployed during the development of the program. Also, waivers would not be issued for midwater trawl vessels fishing in groundfish year round closed areas (if 100% coverage is required in the closed areas). This will apply to all permit categories approved for observer coverage allocations in Amendment 5. MOTION FAILED 3 ,6, 0

NEW ENGLAND FISHERY MANAGEMENT COUNCIL
MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

FINAL REPORT

NEFMC Herring Plan Development Team (PDT)
MAFMC Mackerel Fishery Management Action Team (FMAT)

May 22, 2012

Radisson Airport Hotel, Warwick RI

The New England Council's Herring Plan Development Team (PDT) met jointly with the Mid-Atlantic Council's Mackerel Fishery Management Action Team (FMAT) on May 22, 2012 in Warwick, RI to:

- Review the Draft Environmental Impact Statements (DEISs) for Amendment 5 to the NEFMC Herring Fishery Management Plan (FMP) and Amendment 14 to the MAFMC Mackerel FMP and provide technical recommendations for both Councils to consider during the selection of final management measures for these amendments (June Council meetings)
- Discuss/develop recommendations for industry-funded monitoring programs in Amendments 5 and 14
- Discuss issues associated with river herring bycatch and develop recommendations related to Amendments 5 and 14
- Discuss the overlap between the herring and mackerel fisheries and develop related recommendations for both Councils to consider during the selection of final management measures for Amendments 5 and 14

Meeting Attendance: Lori Steele, Herring PDT Chairman; Jason Didden, Mackerel FMAT Chairman; Rachel Neild, NEFMC Staff: Matt Cieri, Jon Deroba, Tim Cardiasmenos, Sara Weeks, Micah Dean, Jamie Cournane, Min-Yang Lee, Madeleine Hall-Arber, Carrie Nordeen, Lindsey Feldman, Aja Szumylo, Jamie Cournane; Chris Vonderweidt (ASMFC), Steve Correia (via Webinar) (Herring PDT Members); Kate Taylor (ASMFC), Lisa Hendrickson, Drew Kitts, (additional Mackerel FMAT Members); Rob Vincent (NMFS NERO), Dave Ellenton (Cape Seafoods), Jeff Kaelin (Lund's Fisheries), Pamela Lyons Gromen, Jud Crawford (Pew), and several other interested parties.

The meeting audio and presentations, where applicable, are available at: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm.

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After a brief round of introductions, Ms. Steele provided an update to the Herring PDT regarding the status of the Draft Amendment 5 document, the DEIS, public hearing process, and the timeline for final decision-making by the Council (June 19-21, 2012 NEFMC Meeting). Mr. Didden provided a similar update for Amendment 14 to the Mid-Atlantic Council's Mackerel FMP, also scheduled for final-decision making at the June 12-14, 2012 MAFMC Meeting.

1.0 FMP ADJUSTMENTS

The PDT and FMAT discussed several components of Amendments 5 and 14, using the table provided in both DEIS documents, which identifies overlapping measures and outstanding consistency issues (see table in Amendment 5, *Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)*).

1.1 VESSEL REPORTING MEASURES

The overlapping vessel reporting measures include VTR/VMS reporting requirements and trip notification requirements. Many of the existing requirements for the herring fishery were implemented by NMFS through rulemaking in 2011, and the NERO supports implementation of consistent measures in the mackerel amendment. Several consistency issues were identified by the PDT and FMAT for consideration during final decision-making:

- Lead times for pre-trip notifications should be consistent across both the herring and mackerel fisheries. 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. Therefore, the PDT/FMAT recommends that the Councils consider adopting a 48-hour lead time for pre-trip notifications in both amendments.
- If the Councils adopt pre-trip notification requirements (for observer deployment), the language in the final amendment referring to a "pre-trip notification system" should be interpreted generally and not necessarily to mean the existing pre-trip notification system (PTNS) for the groundfish fishery. It may ultimately be more efficient to develop a new (more flexible/adaptable) pre-trip notification system.
- A pre-trip notification system can be costly (time, manpower, resources) and should only apply to the vessels targeted for observer coverage. The current pre-trip notification system includes two full-time staff members with others who fill in during evenings, weekends, and holidays. The system has to be available 24 hours a day, seven days a week. Currently, over 1,000 vessels call-in over 20,000 pre-trip notifications every year. While the notification system is helpful to the observer program in deploying observers more efficiently and reducing costs associated with dock tours and sending selection letters, it becomes inefficient and more costly (for the industry and government) if vessels that are not subject to observer coverage requirements are utilizing the system. The language in Amendment 5 should acknowledge that the notification system should link directly to the observer coverage requirements in the fishery as well as provide some flexibility to allow NMFS to notify vessels (perhaps annually) when there is a need to participate in the pre-trip notification program.

- Current pre-trip notification requirements for the herring fishery (72 hours) apply to Category A/B/C/D vessels fishing with midwater trawl gear in Areas 1A, 1B, and 3. These requirements were implemented as part of the haddock catch cap provisions in Framework 43/46 to the Groundfish FMP and may require modification for consistency purposes, depending on which notification requirements are adopted in Amendment 5 and to which vessels they apply.
- One outstanding issue that the PDT/FMAT identified relates to notification and reporting requirements for mixed herring/mackerel trips. Currently, there are VMS declarations for the herring fishery and Amendment 14 considers them for the mackerel fishery, but not for mixed trips. There is no pre-trip gear declaration proposed in the mackerel amendment, but there is one proposed in the herring amendment. The mackerel amendment is proposing daily VMS reporting, which is already required in the herring fishery. Implementing the same requirements for both fisheries may improve consistency. The Herring PDT/FMAT suggests that further consideration of a pre-trip "pelagic" or "herring/mackerel" mixed trip VMS declaration may be useful to streamline requirements for the industry, improve compliance, and enhance enforcement of regulations in both fisheries.

1.2 DEALER REPORTING MEASURES

The Dealer Reporting Measures in Amendment 5 and Amendment 14 include a requirement for dealers to accurately weigh all fish and several sub-options to clarify that requirement and possibly provide an additional cross check between VTR and dealer data. NERO staff expressed support for Option 2C, which would utilize the Fish Online system to allow vessel operators to verify their sales with the corresponding dealer reports. ACL/sub-ACL monitoring in the herring fishery relies on multiple data streams, and providing a cross-check between the dealers and the vessels at the first point of sale could reduce mis-matches between VTR and dealer data. This, in turn, could enhance real-time quota management as well as the end-of-the-year data reconciliation process. NERO staff noted that the Agency's long-term goal is to make Fish Online more user-friendly and helpful for the industry to access catch data.

1.3 OTHER PROPOSED FMP ADJUSTMENTS

Before moving on, Ms. Steele asked the Herring PDT members for additional comments/discussion on the elements of the Amendment 5 catch monitoring program that do not overlap with the mackerel amendment. The PDT and FMAT briefly discussed measures to address transfers of herring 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. The Herring PDT also agreed to update the permit numbers for the limited access mackerel program, for the Council to consider when selecting measures to (possibly) allow some limited access mackerel vessels with open access herring permits to fish under a possession limit higher than the current 3 mt.

Table 1 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 1 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits

		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 preliminary; implementation of the mackerel limited access program is pending.

2.0 MEASURES TO MAXIMIZE SAMPLING AND ADDRESS NET SLIPPAGE

The Herring PDT/Mackerel FMAT discussed the measures under consideration in both amendments to maximize sampling at-sea and address net slippage.

- Under each of the measures selected to improve/maximize sampling at-sea (Section 3.2.2), language should be added/modified to clarify requirements for each gear type subject to the provisions (midwater trawl, purse seine, bottom trawl).
- The Herring PDT/Mackerel FMAT does not support the options under consideration in Amendment 5 to address net slippage that include a *catch deduction* for reasons previously discussed (may increase inconsistencies between data sets and complicate catch monitoring, not consistent with the goals and objectives of Amendment 5; potential consequence of closing a management area/triggering accountability measures and affecting vessels that may not have slipped catch; see February 24, 2011 Herring PDT Report for additional discussion).
- Overall, the PDT/FMAT noted that the options under consideration to address net slippage are somewhat ad hoc and reflect a general lack of understanding about the extent of problems related to net slippage. The PDT/FMAT support improved data collection and efforts to minimize unsampled/unobserved catch; many of the measures to address net slippage may not improve catch monitoring by minimizing unsampled catch or increasing the observers' ability to estimate the content and species composition of a bag, depending on how participants respond to the various measures. The PDT/FMAT reiterated its concerns about safety-at-sea and suggested that the Council consider issues related to National Standard 10 (Safety) when selecting final measures and providing its rationale. Moreover, there may be other reasons that the Council supports a trip termination measure to address net slippage; the Council should identify these reasons when selecting final management measures. The PDT/FMAT reiterated the importance of ensuring that observers are not placed in situations where they are perceived to be serving as enforcement agents.
- Requiring a Released Catch Affidavit may provide some additional information to evaluate the frequency and nature of slippage events in the fishery. The Council may want to consider implementing this requirement on all trips, not just trips with an observer on board. While it is not clear how effective enforcement of this requirement could be, it still could provide a low gain (in terms of additional information) for a relatively low burden. Although this information is already required to be reported on VTRs, an affidavit would create a separate, perhaps more detailed source of information to evaluate slippage.

2.1 CLOSED AREA I INFORMATION

- Only one slippage event has been observed in Closed Area I since the implementation of the rules in November 2009. The PDT/FMAT recognized that interpretation of this information needs further consideration, for example to understand the nature of slippage outside of Closed Area I and whether "Closed Area I Rules" have been successful in reducing slippage events. To do so, the PDT/FMAT briefly reviewed preliminary observer data summarizing "catch not brought on board" in the herring fishery during 2011 (see below).
- NEFOP staff on the Herring PDT investigated recent observer data more closely to evaluate the occurrence of slippage events outside of Closed Area I.

  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.

2.2 PRELIMINARY 2011 OBSERVER DATA (INCLUDING CATCH NOT BROUGHT ON BOARD)

The following information was provided by NEFOP staff on the Herring PDT and updates some information provided in the Amendment 5 Draft EIS.

Table 2 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 2 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%
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

Table 3, Figure 1, and Figure 2 on the following pages 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 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 the Draft Amendment 5 EIS (see Section 5.3.2.1, p. 413 of Amendment 5 DEIS for comparable 2010 data).

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.

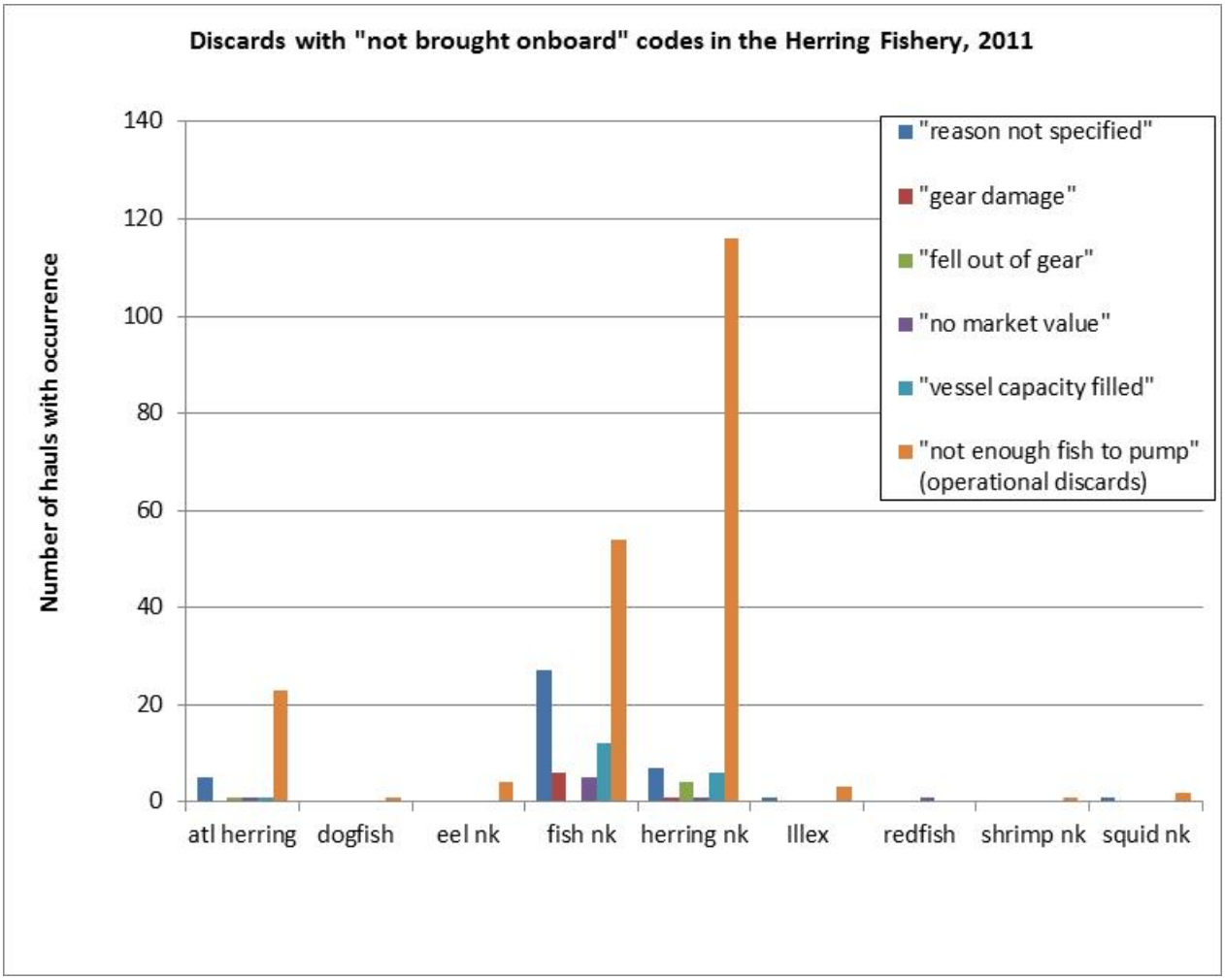
A review of the observer data indicate that in 2011, **78 out of 1,140 hauls** were observed on limited access declared herring trips to have experienced full or partial slippage events (catch not brought on board, not including operational discards). The ratio of total estimated catch not brought on 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).

Table 3 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

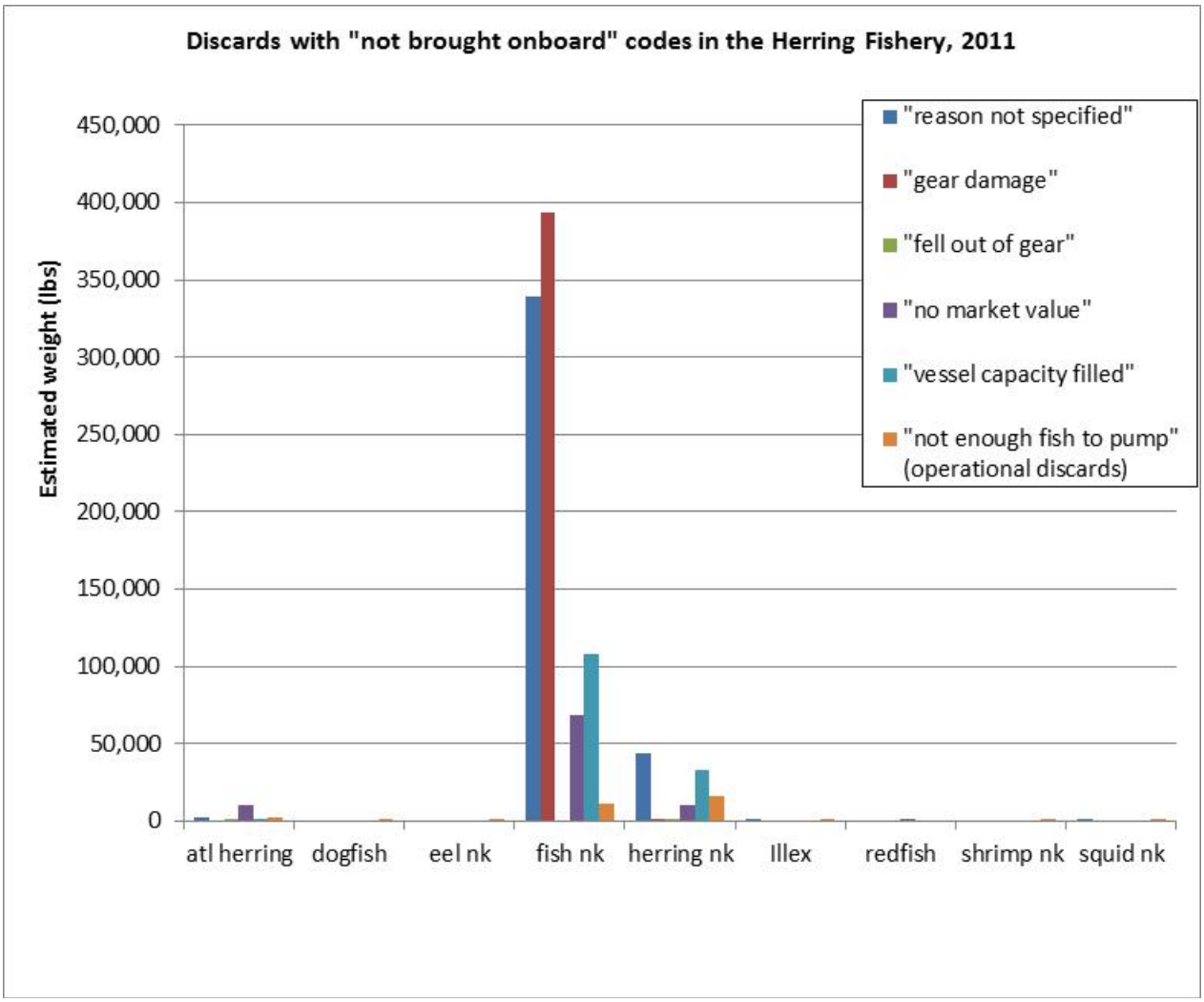
Note: Information in all columns except for the far right ("not enough fish to pump" (operational discards)) represents partial/full slippage events.

Figure 1 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 2 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*."

3.0 ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE AND OPTIONS FOR INDUSTRY-FUNDED CATCH MONITORING

Amy Van Atten from the Northeast Fisheries Observer Program (NEFOP) presented an overview of updated information about the NEFOP Fisheries Sampling Program and costs associated with both observer coverage and at-sea monitoring programs (which utilize service providers). The PDT and FMAT discussed cost issues associated with observers and at-sea monitors. Ms. Van Atten noted that the Atlantic herring fishery is the most complicated fishery in the Northeast Region to sample.

Observer costs throughout the Northeast region are higher than costs in other parts of the country for many reasons, including more complicated trip logistics, high levels of training required, and a high rate of trip cancellation. Observers on the west coast, for example, are often deployed for 30 days at a time, resulting in reduced travel expenses and less down time. Northeast region fisheries include many single and small boat day trips, which are spread across multiple states and remote ports. Frequent trip cancellations (due to poor weather or fishing conditions) also increase costs. Depending on how the program is structured, the per-day costs of an industry-funded catch monitoring program are not likely to be significantly less than the per-day costs of the NEFOP program.

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 and 14, it should be recognized by all parties that this element of the amendments may require more time for implementation than others. Ms. Van Atten's presentation explores several ways to reduce costs and compares costs between utilizing NEFOP observers and at-sea monitors; this information will be presented to the Herring Committee at its June 6 meeting.

Mr. Didden also presented a preliminary vessel by vessel analysis that appears to show that while over 2008-2010 vessels that have over 500 pounds of river herring observed caught in one year may have over 500 pounds caught in another, the vessels varied considerably from year to year in terms of both the absolute quantity of river herring caught and in terms of the ratio of river herring caught to retained catch. This analysis was in response to a comment submitted on April 3 by Jim Ruhle. Due to the limited time available for new analysis the findings would have to be categorized as very preliminary. In addition, targeting of individual "problem" vessels might be out of the scope of alternatives considered in Amendments 5 and 14. Additional work on this issue may suggest measures that could be appropriate for future consideration.

3.1 MONITORING PROGRAM – GOALS AND OBJECTIVES

The New England Council identified the following goals (numbered) and objectives (bulleted) of the catch monitoring program established in Amendment 5 to the Herring FMP:

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 sea 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.

The Mid-Atlantic Council's goals in terms of monitoring are:

"**Implement Effective RH/S Catch Monitoring**" – Purpose A is to consider alternatives that would implement monitoring programs for the Mackerel, Squid, and Butterfish (MSB) fisheries that are sensitive enough and robust enough to the spatial and temporal variability of River Herring/Shad (RH/S) distributions so that good RH/S catch estimates can be generated.

In 2008, two researchers from the Archipelago organization in British Columbia authored a paper evaluating monitoring and reporting needs for sectors in New England (McElderry and Turris 2008). In the paper, they urged that, "the design of an effective and comprehensive monitoring program is guided by having a clear understanding of the objectives for the program." Objectives were broken into categories based on whether they were objectives of managers or industry participants, and some were considered to be shared while others were distinct between the two groups. The objectives for managers included TAC management, quantifying total mortality, species and area management, timely information, improved stock assessment, and improved compliance. Industry's monitoring objectives were listed as timely and accurate data, a level playing field, affordability, and economic benefits.

Once program goals and minimum data needs are determined, calculations can be done to determine the most cost-effective way to achieve the desired outcomes.

3.2 NEFOP SEA SAMPLING VS. AT-SEA MONITORING

The goals and objectives for the New England catch monitoring program (above) are relatively broad in scope. Identifying a narrower set of goals and objectives for an industry-funded monitoring program and reducing sampling requirements could reduce costs and enhance the program's effectiveness in the earlier years. Data generated by a more simplified at-sea monitoring (ASM) program may not be comparable/additive to NEFOP observer data, but may still provide some critical information to enhance catch monitoring and address the goals and objectives identified by the Councils. Moreover, while NEFOP and ASM data may not be additive, they could still be utilized for the same purposes because they should meet the same data quality standards (i.e. quota monitoring, estimating bycatch, stock assessment, depending on the goals and objectives). Developing a more simplified ASM program funded by the industry could be an intermediate step towards a more comprehensive long-term program that can evolve adapt to meet the monitoring and data collection needs of management, science, and the industry.

After the implementation of Amendment 5 (and Amendment 14), Federally-funded observer coverage would continue through the NEFOP at a baseline level (currently defined by the SBRM process), so an industry-funded program could be developed separately and focused, at least at first, on a more narrow set of sampling objectives. Biological sampling could be eliminated for ASMs, reducing training and gear costs. ASMs could be tasked with documenting and providing detailed information on slippage events in the fishery (as one objective, for example). However, the PDT and FMAT recognize that "data creep" (data collection needs, which continue to increase) and multiple priorities will likely make it more challenging shave costs in this area.

Table 4 provides perspective on some example goals for a monitoring program; these examples have been gleaned from a literature review (background work for the groundfish program) and include some goals that were identified through the NEFMC sector workshop (2011). Some additional examples that relate directly to the herring fishery have been provided for consideration relative to an at-sea monitoring (ASM) program versus the NEFOP observer program. All of the example goals provided in the table below are currently being addressed by the NEFOP sea sampling program.

Table 4 Example Goals for Monitoring Programs

Category	Goal
Science	Determine total catch and effort of target or regulated species
Science	Determine total catch and effort of non-target or non-regulated species
Science	Biological sampling
Science	Environmental parameters
Science	Protected species monitoring/sampling
Science	Determine discard rate
Science	Quantify total mortality including discards
Science	Determine catch by area
Science	Obtain accurate catch and effort information
Compliance	Area and gear restrictions
Compliance	Illegal discarding
Compliance	Prohibited species
Compliance	Monitor overall ACL
Other	Reduce management and/or biological uncertainty
Herring	Document slippage
Herring	Document at-sea discards
Herring	XXX

Table 5 generally describes the differences between Northeast Fisheries At-Sea Monitoring Program Monitors (ASM) and Northeast Fisheries Observer Program (NEFOP) Observers (or NMFS-approved observers). Both programs are developed and overseen by NMFS Fisheries Sampling Branch at the Northeast Fisheries Science Center (NEFSC). The main difference between the two is that monitors collect a reduced set of data, thereby reducing training time, gear requirements, and internal support resources. NEFOP observers and ASM monitors are trained by the NEFSC. Data collected by both programs are processed by the NEFSC. Observers and monitors identify and record all species caught, are trained in sub-sampling methodology, and receive advanced training in vessel safety.

Table 5 Differences Between NMFS-Approved Observers and At-Sea Monitors

TASKS/ REQUIREMENTS	ASM MONITOR	NEFOP OBSERVER/NMFS-APPROVED OBSERVER
BACHELOR'S DEGREE	NO (High School diploma or equivalency)	YES
NMFS TRAINING DURATION	11 days	15 days
DATA COLLECTION	Basic	Advanced Ex: sighting logs
BIOLOGICAL SAMPLING	None	Mammals, turtles, birds, fish, and crustaceans
AMOUNT OF GEAR ISSUED	44 items	83 items
GEAR CHARACTERISTICS INFORMATION	Basic	Advanced Ex: record intricate gear configurations
PERFORMANCE-BASED BONUS PROGRAM	No	Yes (Discontinued)
SUPPLEMENTAL RESEARCH PROJECTS	No	Yes
RECORDING DATA	Paper + Electronic (Paper worksheets, iPaq)	Paper + Electronic (Paper Logs, iPaq, Rugged laptops)
TRAINING TRIP REQUIREMENTS	Not required, however added to training and shadow trip program	Yes, 4 are required
TRAINING PROVIDER	NEFSC	NEFSC
DATA PROCESSING	NEFSC Data availability = ~7 days	NEFSC Data availability = ~90 days

The costs of the monitoring program may be reduced through ASMs in several ways: (1) ASMs can be contracted for shorter time frames (2 years versus 5 years); (2) the duties of ASMs can be more narrowly defined geographically, temporally, or through selection of vessels/gear types; (3) the multi-vendor contract model may encourage competition and result in reduced program costs; (4) ASMs do not have defined meal reimbursement policies or monetary data quality bonus incentives; and (5) training and gear requirements/costs may be reduced by removing biological sampling requirements and/or other sampling depending on the goals/objectives.

3.3 MONITORING PROGRAM – POTENTIAL COSTS

The costs of an industry-funded monitoring program will depend on the details – scale, number of vessels, goals and objectives. Analysis in the Draft Amendment 5 EIS evaluates the costs of observer coverage and impacts of industry-funded at-sea monitoring based on an assumed rate of $1,200 per sea day. This could be considered an upper bound on costs and is based on the objective of sampling the fishery to generate data that mirror the NEFOP observer data (i.e., to generate accurate accounts of catch and bycatch in the fishery).

The Herring PDT and Mackerel FMAT agree that the dockside monitoring program proposed in Amendment 14 to the Mackerel FMP is likely to provide a significant cost savings for collecting catch information for the mackerel fishery. The PDT/FMAT support future reconsideration of a dockside monitoring program for the herring fishery.

Currently, NMFS does not have legislative authority to collect funds to support government-contracted observer coverage, with very limited exceptions (North Pacific). A mix of government and industry funding is utilized by some programs in the U.S., including the North Pacific Groundfish Observer Program (NPGOP), Northeast Fisheries Observer Program (NEFOP), and At-Sea Hake Observer Program (A-SHOP).

North Pacific Groundfish Observer Program (NPGOP)

- Largest industry-funded program, est. 1989
- Groundfish vessels 60-125 feet (30%), groundfish vessels greater than 125 feet (100%), shoreside processors 500-1000 mt groundfish per month (30%), shoreside processors more than 1000 mt groundfish per month (100%)
- NMFS – operational oversight, certification training, identification of observer duties and sampling methods, observer debriefing, data management, observer program management
- Industry (vessel owners, processing plant owners) – observer costs (wages)
- In 2009, the industry provided approx. $13M to support observer deployment and data collection, and NMFS provided about $4.7M to support the program.

At-Sea Hake Observer Program (A-SHOP)

- Est. 2004
- 100% coverage catcher-processors and motherships (2 observers on vessels 125 feet or greater)
- NMFS – operational oversight, certification training, identification of observer duties and sampling methods, observer debriefing, data management, observer program management

Atlantic Sea Scallop Observer Program

- Est. 2006 through Emergency Rule and permanently implemented in A13 to monitor bycatch of yellowtail flounder in Scallop Access Areas, and interactions with sea turtles
- 10% of all scallop trips in Access Areas and limited access trips in open areas
- Current service providers – AIS (70 observers), EWTS (26 observers), Fathoms Research (8 observers)

Northeast Multispecies (Groundfish) Monitoring Program (Work in Progress)

- Regulations pertaining to an industry-funded monitoring program for the multispecies (groundfish) fishery were implemented in Amendment 16 to the Northeast Multispecies (Groundfish) FMP.
- NEFOP funds increased in FY2010 for groundfish sector monitoring; funding limited for future years, and shifting towards industry-funded program
- Current service providers (paid directly by NEFOP through contracts) – AIS (43 observers), EWTS (26 observers), and MRAG (28 observers)

Based on Groundfish Fishing Year 2010, the overall cost at-sea monitoring sea day cost is $917.95 (see Table 6). The costs for an at-sea monitor can be separated into two components: at-sea and infrastructure. At-sea monitors are paid a sea day rate and an hourly rate when they're on land or extended travel. They use an average of 12 hours per day for at sea time. The average at-sea monitor sea day wages, insurance, and benefits comprise the highest percentage of costs at 68.68% ($630.44). Travel and training are smaller components at 3.52% ($32.28) and 4.08% (37.46) respectively. Infrastructure and support costs account for the remainder. These include coordination of trip logistics, gear and equipment, communication and shipping, business fees and taxes. Sector contract labor including training and data processing costs $114.17 (12.44%). Support contracts for expert trainers, vessel training trips, freezers and facilities cost $37.88 (4.13%). Gear costs another $8.85 (0.96%). FSB FTE labor costs $50.86 (5.54%) and travel is $6.00 (0.65%).

Table 6 NEFOP and ASM Cost Comparison for Groundfish Fishing Year 2010

CALCULATION OF SEADAY COSTS FOR ASM AND NEFOP (Based on Groundfish Fishing Year 2010)

ASM COSTS	ESTIMATED TOTAL COST PER SEADAY	AT-SEA PORTION OF SEADAY COST	Percentages
ASM Seaday (avg)	$630.44		68.68%
ASM Travel (avg)	$32.28		3.52%
ASM Training (avg)	$37.46	$700.19	4.08%
Sector Contract Labor (Training and Data Processing)	$114.17	INFRASTRUCTURE PORTION OF ASM SEADAY COST	12.44%
Support Contracts (Expert Trainers, Vessel Training Trips, Freezers, Facility)	$37.88		4.13%
ASM Gear	$8.85		0.96%
FSB FTE Labor	$50.85		5.54%
FSB FTE Travel	$6.00		0.65%
Center Overhead	$0.00	$217.76	0.00%
*SUPER LOADED ASM SEADAY		$917.95	

NEFOP COSTS	ESTIMATED TOTAL COST PER SEADAY	AT-SEA PORTION OF NEFOP SEADAY COST	Percentages
NEFOP Seaday	$741.88		49.88%
NEFOP Travel	$59.38		3.99%
NEFOP Training	$39.70		2.67%
NEFOP Meals	$12.55		0.84%
NEFOP Data Quality Rewards	$41.22		2.77%
NEFOP Land Hours	$1.41	$896.14	0.09%
NEFOP Contract Labor	$165.98	INFRASTRUCTURE PORTION OF NEFOP SEADAY COST	11.16%
Support Contracts	$37.88		2.55%
NEFOP Gear	$13.65		0.92%
FSB FTE Labor	$170.06		11.43%
FSB FTE Travel	$6.00		0.40%
Center Overhead	$197.51	$393.57	13.28%
*SUPER LOADED NEFOP SEADAY		$1,487.22	

3.4 ATLANTIC HERRING VESSELS (BACKGROUND INFORMATION)

Table 7 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 7 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

Source: NMFS Permit databases, May 2011

As Table 8 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 Category D permits that landed herring increased significantly in 2010 to 94, up from 67/68 in 2009/2008 respectively.

Table 8 "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.

3.5 IMPORTANT CONSIDERATIONS

The Herring PDT and Mackerel FMAT discussed various elements of a draft discussion paper identifying issues associated with developing an industry-funded monitoring program, which would provide information about costs associated with observer coverage and at-sea monitoring and will discuss some possible approaches to developing an industry-funded program for the herring fishery. Following the meeting, it was agreed that the elements of the discussion paper would be incorporated into this report.

The Herring PDT and Mackerel FMAT note the following important considerations:

- 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 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. The PDT and FMAT also suggest consideration of a "Pelagic Industry-Funded Monitoring Program" to further align long-term management of the herring and mackerel fisheries. This program could incorporate the at-sea monitoring components of both amendments and the shoreside monitoring component of Amendment 14, to improve coordination and allow monitoring to advance in the most cost-effective and efficient manner for both fisheries.
- An industry-funded catch monitoring program, if developed for the herring fishery, should be "**adaptable**," i.e., structured so that additional elements like shoreside and electronic monitoring may be incorporated in the future.
- The **delineation of duties** for each party in a monitoring program needs to be considered carefully in order to ensure accuracy of data, elimination of redundancy, and cost reduction.
- It may be prudent to consider a more **comprehensive approach** to developing industry-funded monitoring programs for all fisheries in the Northeast Region.
- **Communication networks** are important, and notification requirements are essential.
    - For 100% coverage, the sampling frame can be determined through vessel permits. For less than 100% coverage, the PTNS or similar system would be utilized to allow NMFS/NEFOP to select trips to cover and deploy observers
    - Within Agency – permit information and adjustments to coverage levels and vessels subject to monitoring requirements
    - NMFS and Industry – requirements for coverage, notifications, observer health and safety regulations, issuance of waivers
    - NMFS and Service Providers – roles and responsibilities clearly defined, coverage levels and priorities, vessels subject to requirements, how/when information will be transmitted
    - Industry and Service Providers – fees to be charged per trip, what costs are included, billing and payment procedures, how late payments will be handled.

- **Nonpayment issues** may be a concern. Observer service providers may refuse to deploy observers on a particular vessel if that vessel has outstanding balances due. Regulations may be implemented to protect observer service providers from fishermen who refuse to pay their observer service charges.
- A close working relationship between NMFS Office of Law Enforcement (OLE) and the observer program is critical to ensure that vessels comply with observer requirements, and to maximize the **safety** of observers.

Potential Provisions/Requirements

There are several potential provisions/requirements that the Council could consider implementing as part of an industry-funded monitoring program, to try to address some of the challenges (administration, communication, sampling, observer certification, training, conflict of interest, safety, equipment, data quality) that have been experienced with other industry-funded programs.

- Requirement for the observer service provider to report observer deployments daily to NMFS to allow monitoring of pre-determined coverage levels
- Requirement for observer service provider to report to NMFS the failure to respond to an industry request for observer coverage due to lack of available observers
- NMFS could provide an estimated number of observer sea days for the fishing year to all service providers
- NMFS could maintain a list of certified service providers and distribute this list to all vessels participating in the fishery
- Requirement for observer service provider to submit to NMFS, if requested, a copy of each type of signed and valid contract between the provider and the vessel
- Requirement for observer service provider to submit observer deployment and logistics reports to NMFS on a weekly basis
- Requirement for service providers to sign, under penalty of perjury, a conflict of interest statement
- Daily reports by the providers to NMFS – summary trip data must be reported back to NMFS within 24 hours of landing; raw data must be provided to NMFS within a certain period of time after landing; observer must be available to NMFS for debriefing for a certain period of time following any observed trip
- Prohibition on service providers from deploying the same observer consecutively on the same vessel for more than a certain number of days/trips per month
- Requirements to share information with NMFS re. vessels with outstanding payments due

4.0 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

The Herring PDT and Mackerel FMAT discussed the measures under consideration in both amendments to address river herring bycatch and noted the following:

- Coordination between the herring and mackerel fisheries would be essential under a river herring catch cap, to improve the effectiveness of the cap and potentially reduce impacts on the industry.
- During the development of these amendments, the Mackerel FMAT generally supported a management approach based on river herring catch caps, while the Herring PDT generally supported a spatially-based management approach (the mackerel amendment also considers large-scale area closures). The PDT and FMAT noted, however, that both groups have identified challenges associated with any of the approaches under consideration, and overall, the technical opinions of the two groups are not widely disparate.

At this meeting, the PDT/FMAT jointly discussed the alternatives under consideration. Table 9 summarizes some important factors that both Councils should consider when selecting measures to address river herring/shad (RH/S) bycatch. Several common themes that apply to all alternatives include:

- The statuses of RH/S are “depleted” so mitigation of impacts should be considered.
- The degree of beneficial overall impacts related to RH/S from any measure are uncertain because of the lack of assessment reference points and uncertain contribution from various sources of mortality. Related to a cap, minimal information exists on what would be an appropriate amount for a catch cap.

Table 9 Overview of Measures to Address River Herring/Shad Bycatch in Herring Amendment 5/Mackerel Amendment 14

Measure	Effectiveness in Controlling or Reducing River Herring and/or Shad (RH/S) Catch	Implementation Difficulty	Enforcement Difficulty	Monitoring Needs	Economic Effects
Mortality Caps	While precision is dependent on observer coverage, caps are the only measure that directly control the amount of RH/S catch in a given fishery (though impacts of doing that are uncertain); however, no ability to index a catch cap to the RH/S population size	Requires certain infrastructure and NERO-NEFSC cooperation adjustments but such infrastructure is in place for other fisheries (ex., butterfish, haddock catch cap)	Closures are relatively easy to enforce but assessing compliance with observer call-in requirements is more difficult.	Similar catch and bycatch caps already exist and are monitored on a weekly basis by NERO. Depending on how precise an estimate the Council wants to be using when closing a fishery, may need high level of observer coverage. Programmatic reviews of effectiveness are required for adaptive management.	Difficult to predict but could be significant; If a cap is set high, or low bycatch is observed, then perhaps minimal impacts on fishery. Major impacts are possible if a cap is set low, or high bycatch is observed.
Small Area Management (hotspots)	Reduces catch in the area(s) if in a given year RH/S are present and fishery would have otherwise operated there in such a year. Overall catch impact uncertain since may displace fishing effort and create new bycatch hotspots.	Area-based management is widely used in other fisheries.	Area-based management is relatively easy if all vessels have VMS reporting requirements but harder otherwise. Smaller, shifting areas are harder to enforce.	Easier if all vessels have VMS requirements. All herring vessels have VMS, but not all squid/mackerel/butterfish vessels	Low impacts given the small size of the areas.

Table 9 Overview of Measures to Address River Herring/Shad Bycatch in Herring Amendment 5/Mackerel Amendment 14 (continued)

Measure	Effectiveness in Controlling or Reducing River Herring and/or Shad (RH/S) Catch	Implementation Difficulty	Enforcement Difficulty	Monitoring Needs	Economic Effects
Large Area Management	More likely to reduce RH/S catch than small areas because severe restriction would likely reduce overall effort.	Area-based management is widely used in other fisheries.	Area-based management is relatively easy if all vessels have VMS reporting requirements but harder otherwise.	Easier if all vessels have VMS requirements. All herring vessels have VMS, but not all squid/mackerel/butterfish vessels	Major impacts due to large areas involved.

2nd Program Report

Period covered by Report 6/30/2010 - 5/18/2012

River Herring bycatch Avoidance in Small Mesh Fisheries

Easygrants ID: 21368

Principle Investigators:	Dr. Kevin D. E. Stokesbury
	Dr. Daniel Georgianna
	Dr. Michael P. Armstrong
	Peter Moore
Primary Contact:	Dr. Kevin D. E. Stokesbury
Address:	School for Marine Science and Technology,
	University of Massachusetts Dartmouth,
	200 Mill Road Suite 325
	Fairhaven, MA, 02719
Phone:	(508) 910-6373
Fax:	(508) 910-6374
Email:	kstokesbury@umassd.edu

Project Summary

This project is a collaboration between 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) to develop river herring and American shad (alosine) bycatch avoidance methods. Sustainable Fisheries Coalition 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 specific goals of the project are to develop (1) a real-time bycatch avoidance intra-fleet communication system, (2) a predictive model of where alosines are likely to occur in space and time, and (3) additional support for port sampling to inform the initiative. Work completed to achieve each goal and comparison of to-date results grant evaluation metrics is described in detail in the body of the report. In summary, 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 National Marine Fisheries Service bottom trawl survey database. The MA DMF has sampled 13 of the 14 vessels that have landed in Massachusetts ports, and approximately 161 out of 299 trips (as of 3/15/12). This work is being incorporated into a PhD dissertation titled "Understanding and avoiding River herring and American shad bycatch in the Atlantic herring and mackerel mid-water trawl fisheries". The student has completed all course requirements, passed his comprehensive exams, and is preparing to defend his proposal on May, 30 2012. However, committee members have recommended that another year of fisheries dependent work would add significant strength to the dissertation.

Project Objective: Real-time fleet communication system

Since January 2011, 13 mid-water trawl vessels have participated in three 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 mid-water 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, provided these data. The MA DMF portside sampling program samples approximately 50% of all Massachusetts landings and prior

to 2010 about 85% of all mid-water 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 mid-water trips, though about two-thirds of these samples were from July to December (NEFMC, 2012). Uncorrected tow level data were available about 5 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 1).

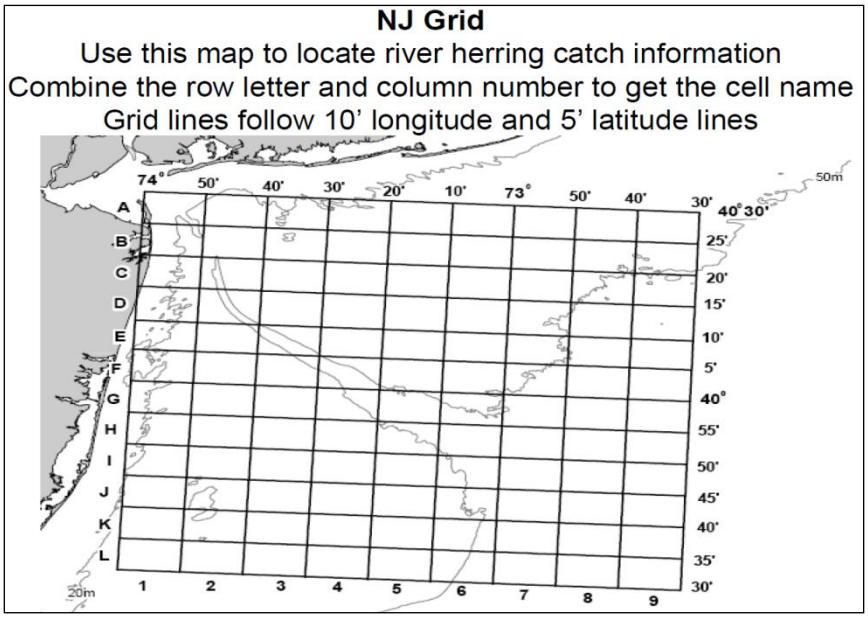


Figure 1. Area of focus for winter 2011 bycatch avoidance system. This handout was distributed to captains and used to communicate bycatch information.

Determine Thresholds to Classify Catches: Large catches of alosine in the mid-water 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 mid-water trawl bycatch by weight (Figure 2). Thresholds were set to identify trips with these large tows (Table 1). 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 (Table 1). 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.

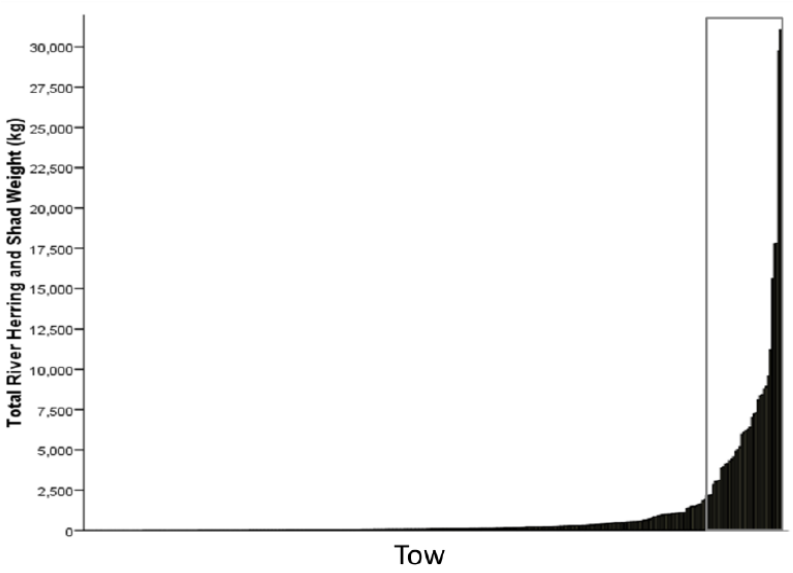


Figure 2. Northeast Fisheries Observer Program observed mid-water trawl tows from January 2000-Septermer 2010 ranked lowest to highest by amount of bycatch. Of the 343 tows shown in the figure the 35 tows with the most bycatch (grey box, top 10%) account for about 80% of observed bycatch.

Table 1. Of 72 trips sampled by Massachusetts Division of Marine Fisheries portside sampling from May 2008-July 2010, 55 had greater than 1kg of alosine bycatch. The six trips with the most bycatch (top 10%) all had greater than or equal to 2,000kg and a ratio less than 1kg of alosines:81kg of target species. Trips with a ratio greater than 1:425 all had less than 900kg 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.

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

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 1). 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).

Using the methods described above (currently being reviewed for publication in Fisheries Research see Bethoney et al Submission), two additional avoidance systems 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 mid-water trawl vessels, fishing activity occurred for approximately two weeks. Information indicating alosine bycatch was unlikely to occur at depths greater than 73m 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 mid-water fleet.

Progress towards Value at Grant Completion: Reduced bycatch

Year to year bycatch reduction should not be used as the primary metric to evaluate the success of this system to reduce bycatch because of potential changes in alosine populations levels, inter-annual variability in alosine catchability, and the nature of bycatch in the fishery (Figure 2). Alosine biomass fluctuations could increase or decrease bycatch amounts independent of avoidance measures. Overlap between mid-water trawl effort and alosine distribution varies inter-annually due to environmental factors and fleet behavior (Kritzer and Black 2009). A single trip within an avoidance area could contain a larger amount of alosines than observed during the entire previous year. If the location of this catch was shared with the fleet, the area was avoided and an area with low bycatch was identified, the system should not be classified as a failure. Based on these reasons evaluation methods should focus on intra-annual metrics of industry participation, consistent, low bycatch in identified areas, and reduced intra-annual bycatch rates (Abbot and Wilen 2010).

Winter 2011: High levels of cooperation by industry members, fishing patterns within the avoidance area, and the appearance of distinct spatial and temporal bycatch patterns within the avoidance areas suggests near-real time communications may have resulted in reduced alosine bycatch. Nine of the 12 active mid-water trawl vessels fishing for Atlantic herring and mackerel participated in the near-real time information system (two of the active mid-water trawl vessels were not recruited to participate because they were landing in New Jersey and primarily targeting

squid but these vessels have participated in subsequent avoidance programs). Approximately 150 emails (indicating departing and landing location, dates and times as well as catch size) were received from these vessels and processing plant managers. A high percent of MA DMF trip logs (containing spatial, temporal and qualitative tow information) were completed by captains of participating vessels. Initial effort was focused in the northwest portion of the avoidance grid. Cells fished in this area were identified as having low or moderate bycatch until an advisory on February 17th identified cell E3 as having high bycatch (Figure 3). This area remained a high bycatch area throughout the fishery as E3 was reentered resulting in another high bycatch event and an additional advisory. After February 17th until the end of the fishery, the mean vector of observed effort was 115 degrees ± 35 degrees (r=0.75, n=8) and significantly different from the direction of the high bycatch area (270 to 360 degrees, Figure 4). The directions are in relation to a center point, placed at the lower right corner of cell E3 (Figure 4). This region, depicted in Figure 4, was chosen as the high bycatch region because it contained multiple moderate cells and a high cell that were identified early enough to expect a quantifiable reaction. The direction of mean effort after February 17th pointed towards the southeast region of the avoidance grid. This region of the avoidance grid was identified as a low bycatch area through an advisory issued on February 25th (Figure 3).

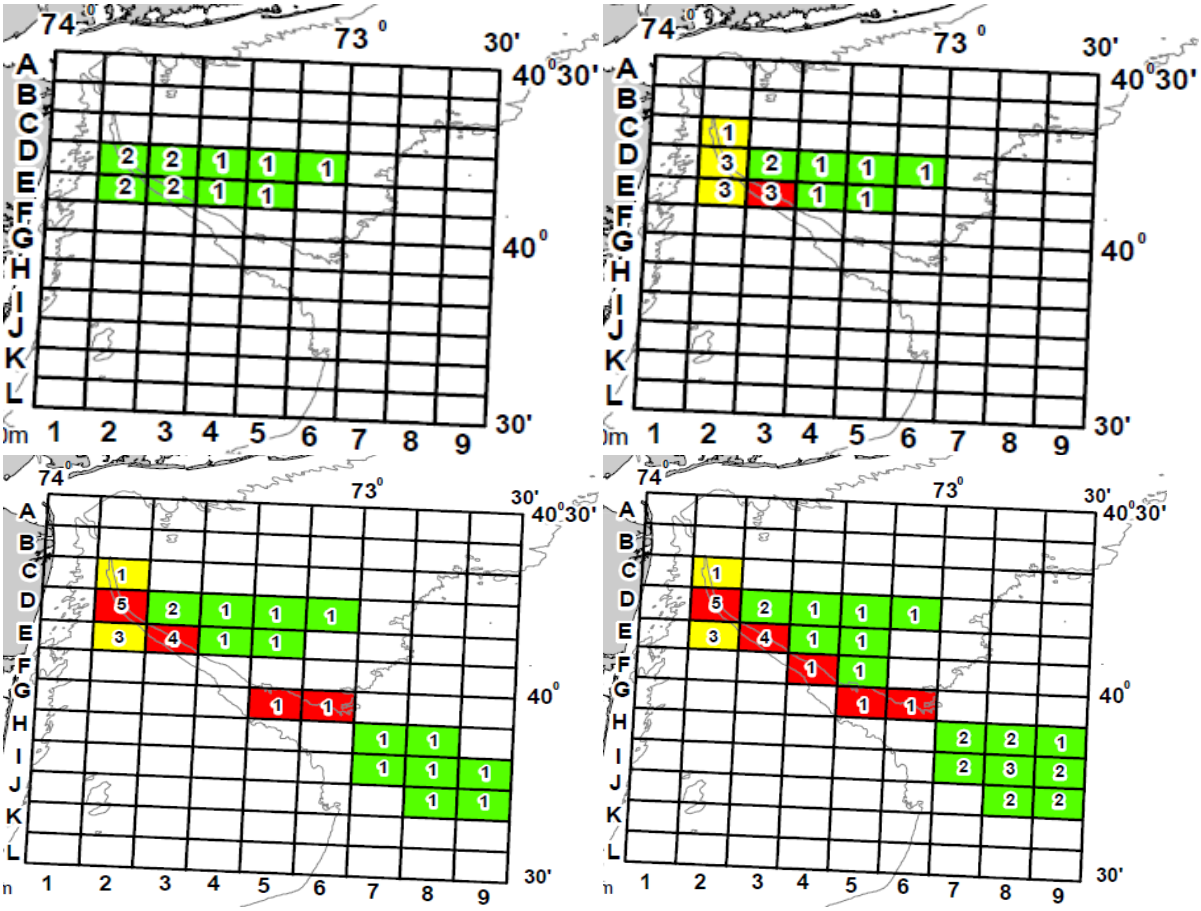


Figure 3. Cumulative bycatch information from 4 different time periods during the winter of 2011, from top left: 2/1, 2/17, 3/2, 4/1. Numbers inside cells indicate the number of tows

within each cell. Red indicates cells with high alosine bycatch while yellow and green indicate moderate and low respectively.

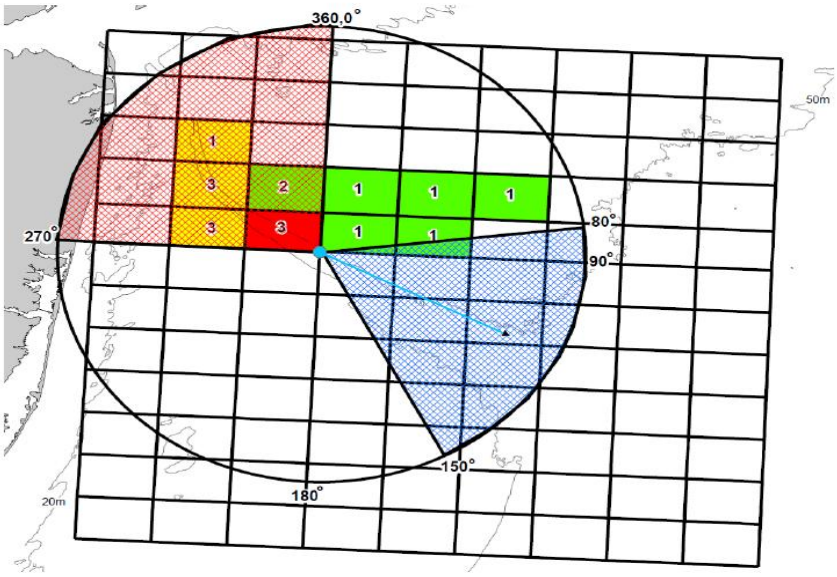


Figure 4. Cumulative alosine bycatch information through February 17th as well as mean direction vector of tow locations (blue arrow) and 95% confidence interval (blue cross-hatch) after February 17th. The vector direction relates to a center point (blue circle) placed at corner of the high bycatch area (red cross-hatch). Numbers inside cells indicate the number of tows within each cell. Red indicates cells with high bycatch while yellow and green indicate moderate and low, respectively.

The overall behavior of the vessels within the avoidance area provides evidence of cooperation (Figure 4). Though the significant shift in tow locations away from the high bycatch area to the southeast could be due to the availability target species, the timing of this shift coincides with bycatch advisories and avoidance of a known high bycatch area. Reentry into the high bycatch cell shows that target species were present in both the northwest and southeast portions of the avoidance grid simultaneously (Figure 3). In total 5 cells were classified as having high bycatch with only one possibly reentered

The appearance of distinct spatial and temporal bycatch patterns within the avoidance area suggests vessels can avoid large catches of alosines within the spatial scale used for this study. The percentages of effort, target catch, and alosine catch, based on MA DMF trip logs and port-sampling, in the northwest region (above row H, Figure 3) and southeast low bycatch region (row H and below, Figure 3) are displayed in Table 2. Based on the occurrence of high and moderate catches of alosines, it appears that alosines initially were absent from the northwestern part of the avoidance grid in large quantities but moved into this area as the winter progressed (Figure 4, Table 2). As effort shifted further offshore to the southeast later in the season, no high or moderate catches of alosines occurred, suggesting a high abundance of target fishes but not

alosines. In addition, the only re-entry into a high bycatch cell, after about 8 days, resulted in another high bycatch event. This displays a degree of temporal stability in the bycatch pattern, which is essential to an effective avoidance system (Abbot and Whilen, 2010; Gauvin et al., 1996). Though the timing of migrations, exact routes and distribution undoubtedly varies from year to year, the catch pattern observed suggests mid-water trawl vessels can be moved to areas with low alosine bycatch and adequate levels of target species using the scale of this study (Table 2).

Table 2. Percentage of trips, target catch, and alosine catch in two separate regions of a voluntary bycatch avoidance area. For trips comprised of tows in both areas, estimated tow weights (by vessel captains) were used for the amount of target catch, while portside sampling amounts of alosines were assigned to a single tow identified by the Northeast Fisheries Observer Program.

Northwest Area			**Southeast Area**		
Trips	Target Catch	Alosine Catch	Trips	Target Catch	Alosine Catch
75%	75%	97%	25%	25%	3%

Intra-annual bycatch reduction was tested by comparing bycatch rates calculated from NEFOP data of participating vessels to a control group. The three active mid-water trawl vessels not in communication or completing MA DMF trip logs during the winter of 2011 were identified as the control group. Bycatch rates (alosine kg/ target mt) are a better measurement of bycatch reduction than total alosine catch, because rates are comparable across different catch and vessel sizes, reflect productivity, and match the definition of bycatch classifications given to SFC members. Though the avoidance systems only alters vessel behavior within areas of focus, the system assumes the majority of bycatch occurs within these areas. Incorporating bycatch rates from all areas could reveal if this assumption is correct and increase sample size. Intra-annual past seasonal (December-April) bycatch rates (2008-2010) of the control and participating vessels for each avoidance system was compared to test if bycatch rates were different before the avoidance system. No significant difference was found between the bycatch rates of control in participating vessels in any year (Figure 5, Mann-Whitney U Test's, all p-values >0.2). However, in 2011 the difference between the mean bycatch rate of participating and control vessels was greatest and the lack of significance is likely due to variance (sample size of control vessels was only 6 tows) and not similarity.

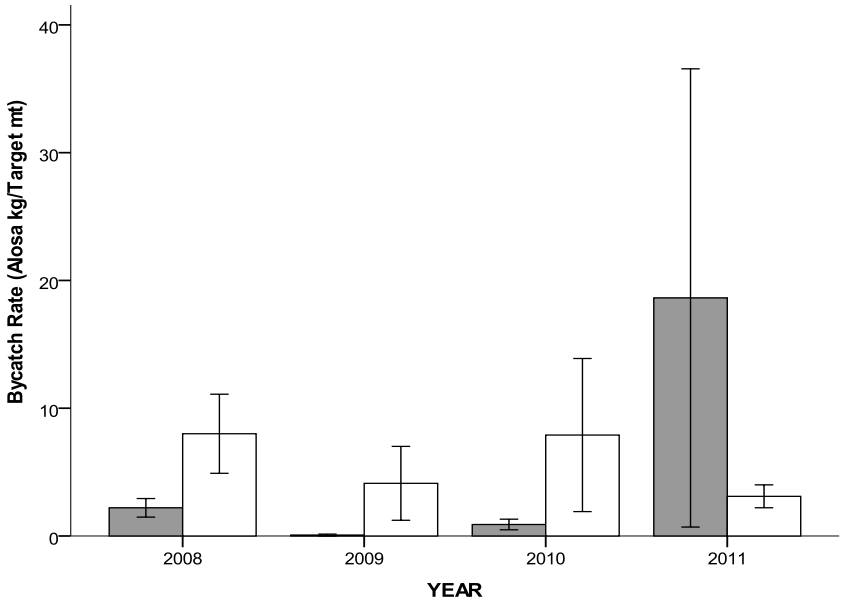


Figure 5. Bycatch rates, calculated from Northeast Fisheries Observer Program documentation of vessels that participated in the winter 2011 avoidance system (white) and those that did not (grey). Past bycatch rates during previous winter seasons (December-April) are also shown. Error bars are ± 1 standard error.

Fall of 2011: Similar to the winter of 2011, industry cooperation and the separation of alosines and target species suggests this system may have resulted in decreased alosine catch. Captains and on-shore managers continued to notify the project of landing and departure times as well as completing MA DMF trip logs. In addition, 10 of the 11 active mid-water trawl vessels participated in the avoidance. Initial effort occurred in the northeast part of the grid with low bycatch (Figure 6). This information was shared with the fleet and effort continued there for the remainder of the two-week fishery with little alosine bycatch. Fifteen of the seventeen Massachusetts landings during the avoidance system were sampled by the MA DMF. These trips landed approximately 3,000 mt of Atlantic herring and less than 3 mt of alosines (MA DMF, Unpublished data). The mean tow depth of participating vessels was significantly deeper than 73m (97m,1-tailed t-test P=.02) and greater than in previous years (ANOVA, Tukey Post Hoc Ps<.01, except 2009 P=.43). NEFOP data from this time period has been requested but not yet received so the bycatch rates of participating and non-participating vessels cannot be compared. In addition, this comparison may not be appropriate because only one active vessel did not participate.

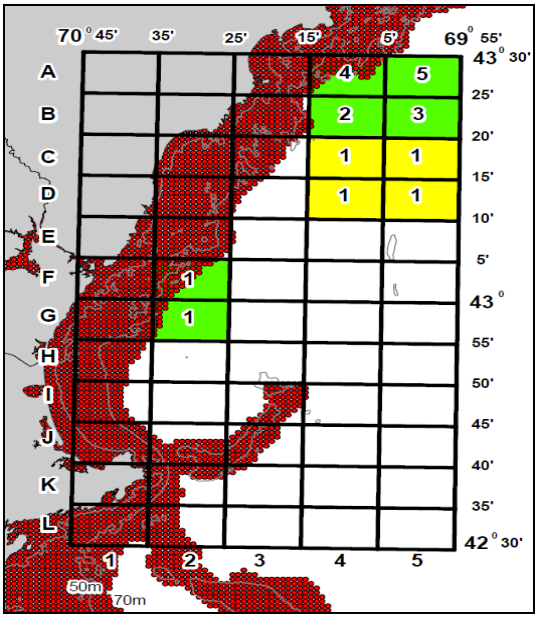


Figure 6. Cumulative bycatch information from fall 2011 avoidance system in the western Gulf of Maine. Numbers inside cells indicate the number of tows within each cell. Yellow and green indicate moderate and low bycatch events. Prior to the opening of the fishery, industry members were informed alosine bycatch was most likely to occur at depths less than 40 fathoms (73m, red dots).

Winter 2012: An avoidance system, covering an additional area off of Rhode Island, was run from mid-December until the Atlantic herring Management Area 2 was closed in mid-February (Figure 7). The results of this avoidance system have not been fully analyzed. Eight advisories were issued during this time period. Fleet participation was high (10 of 11 active vessels). After an advisory on February 4th identified high bycatch in the Rhode Island area, most participating vessels shifted their effort to the New Jersey area to pursue Atlantic mackerel and avoid river herring (D.Conneely personal comm.). One pair of vessels wanted to re-enter a cell classified as having high bycatch. This reentry was discussed and the captain felt, if he used a different technique, he could avoid catching river herring in this area. In his subsequent trip he returned to the high bycatch area and was able to reduce his bycatch percentage from 3.0% to 0.3% (MA DMF, Unpublished data).

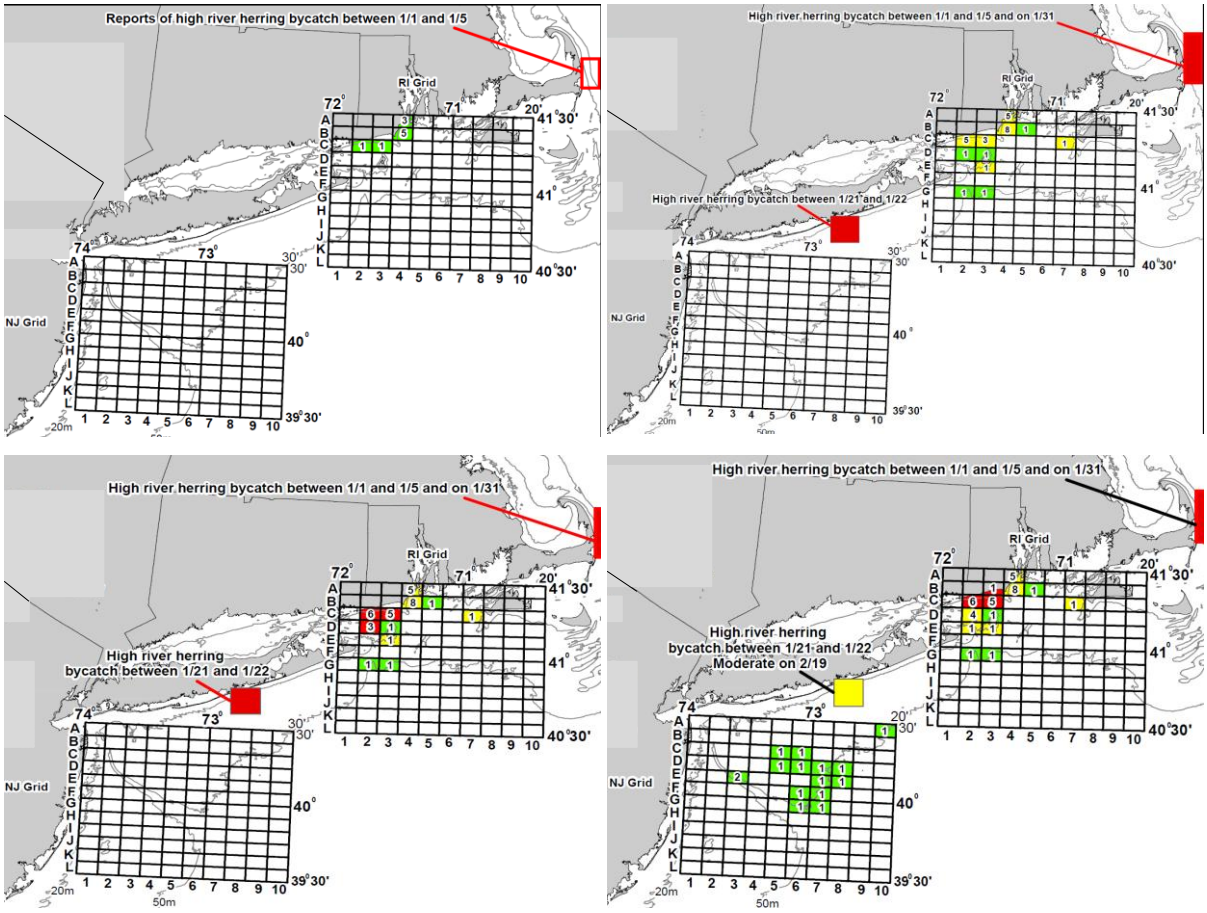


Figure 7. Cumulative bycatch information from 4 different time periods during the winter of 2012, from top left: 1/20, 2/1, 2/4,2/20. Numbers inside cells indicate the number of tows within each cell. Red indicates areas with high alosine bycatch while yellow and green indicate moderate and low respectively.

Overall, the amount and location of effort in the winter of 2012 was substantially different from the winter of 2011 (Figure 3, Figure 7). This difference was likely due to the availability of large schools of Atlantic herring in inshore waters that allowed the Area 2 quota to be taken by February 20th. In past years the vessels continued fishing for the target species in Area 2 until late March or early April and returned in December without reaching the area quota before the new fishing year. In addition, there was more effort off of Cape Cod and Long Island. No avoidance grid was placed near the backside of Cape Cod and disagreement about the spatial scale of information may have resulted in a high bycatch event. The moderate and high catches of alosines off of Long Island represent a bycatch pattern not previously document by any at sea monitoring program. In contrast, only low bycatch events were documented within the New Jersey avoidance area despite effort in similar areas at similar times (specifically cell E3, see Figures 3, 7). These points emphasize the importance of repeating this monitoring and avoidance effort for a third year as there is little past information to compare the amount, locations, and timing of alosine bycatch found in the previous two years. Further, the ability to conduct another avoidance system during the fall will reveal if previous results and bycatch patterns observed in 2011 are repeated 2012. Due to continued high participation by mid-water vessels, there is a lack

of a "control" group (one vessel not participating). If bycatch rates cannot be compared between vessels receiving bycatch information and those that are not, a new method to directly test the effect of these systems on bycatch may be needed. If a direct measure cannot be established, it will be critical to build as much descriptive evidence for bycatch reduction as possible.

Progress towards Value at Grant Completion: Replicable bycatch reduction program (program usable for small mesh fisheries)

In the winter of 2012, with funding from The Nature Conservancy, we replicated our near-real time bycatch information system in the Rhode Island small mesh bottom trawl fishery. Please see attached Nature Conservancy final repot draft for detailed information.

Outreach

Scientific Presentations

6/27/2011: "Developing an alternative scale to address river herring bycatch in U.S. Northwest Atlantic mid-water trawl fisheries". Poster presentation at Reconciling Spatial Scales and Stock Structure for Fisheries Science and Management, Portsmouth, NH

9/3/2011: "An information system to avoid river herring (*Alosa pseudoharengus, Alosa aestivalis*) bycatch in the Northwest-Atlantic". Oral presentation at the American Fisheries Society annual meeting, Seattle, WA

9/3/2011: "River Herring and American Shad Bycatch Avoidance in Atlantic Herring and Mackerel Mid-Water Trawl Fisheries". Oral presentation at the American Fisheries Society annual meeting, Seattle, WA

10/27/2011: "River Herring and American Shad Bycatch Avoidance in Atlantic Herring and Mackerel Mid-Water Trawl Fisheries". Oral presentation at the Northeast Regional Collaborative Research Conference, Portsmouth, NH

9/27/2012: "Quantifying and reducing river herring bycatch in the U.S. northwest pelagic trawl fisheries" Abstract submitted to ICES Annual Science Conference, Bergen, Norway

Scientific Publications

"Developing a fine scale system to address river herring (*Alosa pseudoharengus, A. aestivalis*) and American shad (*A. sapidissima*) bycatch in the U.S. Northwest Atlantic mid-water trawl fishery" Under review by Fisheries Research

Management/Public Presentations

12/20/2011: Oral presentation to the NEFMC Herring Oversight Committee and Advisory Panel

6/30/2011: Poster presentation to NEFMC Plan Development Team

10/11/2011: Oral presentation to MAFMC

2/7/2012: Oral presentation to ASMFC Shad and River herring Management Board

Management/Public Publications

Avoidance system listed as possible river herring bycatch reduction alternative in the NEFMC Amendment 5 to the Atlantic herring Fishery Management Plan

Information from project included in NEFMC Amendment 5 Environmental Impact Statement

Avoidance system listed as possible river herring bycatch reduction alternative in the MAFMC Amendment 14 to the squid, mackerel, butterfish Fishery Management Plan

4/2/2012: "Experts team up to reduce bycatch", New Bedford Standard Times.

5/2012: "Avoidance program IDs river herring hot spots", Commercial Fisheries News

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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 p.

Project Objective: Refine "hot spot" data and develop predictive model

Through discussions with Drs. Eric Palkovacs and Andre Boustany at the Duke University Marine Laboratory (who are working on a National Fish and Wild Foundation project with a similar objective), it was agreed that they would focus on predicting river herring distributions throughout all seasons, while our project would focus on predicting distributions during the winter and applying these findings to bycatch reduction. To achieve this object, we are testing if oceanographic features can be used to indicate areas with a high probability of large catches of alosines, Atlantic herring and Atlantic mackerel. The National Marine Fishery Service (NMFS) bottom trawl and NEFOP mid-water trawl data sets contain catch at sea data useful for achieving this goal. Restricting our analysis to the winter allows us to focus on the region (south of Cape Cod, Massachusetts) and time where the NMFS bottom trawl survey and the mid-water trawl fishery overlap, where the most alosine bycatch occurs, and reduces seasonal and regional factors. Based upon the environmental measurements taken at sea by the NMFS bottom survey and past studies, the variables sea surface temperature, bottom temperature, the difference between sea surface and bottom temperature, bottom salinity, surface salinity and depth were examined for a relationship to catch at sea.

If correlations are found between environmental factors and catch at sea, results could be used to identify specific pathways or areas associated with each species. The utility of this information to reduce bycatch could then be tested using the NEFOP mid-water trawl dataset and the Finite-Volume Community Ocean Model (FVCOM). FVCOM is a verified prognostic coastal ocean circulation model that incorporates realistic time-dependent temperature projections and can be used to identify oceanographic conditions on a daily basis from 2000-2009 (Chen et al. 2003, Chen et al. 2006, Cowles 2008). FVCOM environmental data was joined to NEFOP catch at sea data through at stepwise process in ArcGIS 10. Hindcast environmental conditions were mapped using natural neighbor interpolation to create a continuous surface of temperature, salinity and depth values from the FVCOM data points. Natural neighbor interpolation uses continuous, area-based weighted averages to create a structured surface of points based on existing data points and does not interpret trends (therefore all values are within the range of real data). The result is a smoothed distribution, making it appropriate for variables that are influenced by adjacent areas (Tsai et al. 2005). NEFOP catch-at-sea data was then be plotted with an area of uncertainty for catch location. Catch locations were assigned a catch radius equal to the average straight line tow distance because most mid-water trawl vessels turn during a tow; eliminating the usefulness of the tow end location. The NEFOP catch locations were then joined to the environmental conditions they overlapped with in time and space. This created a new dataset that could be used to compare much bycatch and target catch was within predicted alosine "hot spots".

Progress towards Value at Grant Completion: Predictive maps

For all five species the NMFS data set is dominated by samples without catch but that may contain relevant environmental information. Based upon this and graphs of abundance and presence/absence of each species against environmental variables, we attempted to use logistic regressions to find correlations between environmental variables and catch at sea. Logistic regression models can provide equivalent qualitative results as more complex statistical approaches (Fletcher et al. 2005, Lewin et al. 2010). Logistic regressions relate binary response variables to predictor variables by identifying a probability of occurrence as a function of the

predictor variables (Hosmer and Lemeshow 2000). Catch at sea of alewife, blueback herring, American shad, Atlantic herring, and Atlantic mackerel was transformed into a binary variable by classifying the fishes as present or absent in a tow or by using a threshold amount. However, catch at sea patterns within the NMFS bottom trawl dataset fitted logistic regression models poorly. When environmental variables were transformed, through squaring or square rooting, results did not make sense from a biological perspective despite indications of a good fit to the logistic regression model. Therefore, we have changed our approach and are now using a likelihood ratio test (G test). The G-test can be used to test if the probability of catch at sea is uniform across an environmental variable range. Further, if the initial test yields significant results, the G-test statistic is additive allowing for the results of several G-tests to be summed. This allows for ranges of equal probability of catch to be identified (Sokal and Rohlf 1995). Using this method we have identified several ranges of environmental variables with significantly different probabilities of alewife catch within the NMFS bottom trawl survey (Table 3). In addition, the probability of Atlantic herring catch differs with ranges of sea surface and bottom temperature (Table 3). We plan to continue using the G-test method to test the remaining environmental variables and species of interests. These result could then be analyzed and combined to create predictive maps of where alosines are most likely occur during the winter. The utility of this information to reduce bycatch could then be evaluated by comparing the environmental ranges associated with alosines to Atlantic herring or mackerel and catch within the NEFOP/FVCOM database .

Table 3. Preliminary results of G-test analysis to identify marine preferences for alewife, blueback herring, American shad, Atlantic herring and mackerel. The probability of catch within a given range is homogenous, while the probability of catch between groups is significantly different (Unplanned tests for homogeneity with Dunn-Šidák Correction). Blank spaces indicate a repeated cell value.

Feature	Species	Range	Proportion Present
Sea Surface Temp. (^{o}C)	Atlantic herring	1-3,5-7	0.60
		4	0.52
		8-9	0.25
		10-11	0.05
	Alewife	1-6	0.51
		7	0.37
		8-9	0.20
		10-11	0.05
Bottom Temp. (^{o}C)	Atlantic herring	6-7	0.70
		1-5	0.56
		8	0.42
		9	0.25
		10	0.12
		11-13	0.05
	Alewife	1-7	0.47
		8-9	0.25
		10-14	0.15
Sea Surface-Bottom Temp. (^{o}C)		-8--4,-2-0	0.36
		1-2,-3	0.28
		3	0.05
Surface Salinity (PPT)		20-30,32-33	0.45
		31,34	0.25
		35	0.03
Bottom Salinity (PPT)		24-33	0.45
		34	0.34
		35	0.16
		36	0.09
Depth (m)		41-80	0.46
		0-30,101-110	0.33
		31-40,81-100,111-291	0.24

Outreach

Scientific Presentations

6/26/2012: "The utility of environmental predictors of catch to reduce bycatch in the northwest Atlantic mid-water trawl fishery" Abstract accepted to The Relative Importance of Fishing and the Environment in the Regulation of Fish Population Abundance, A Symposium of the American Institute of Fishery Research Biologists, New Bedford, MA

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Project Objective: Expand MA DMF Port-sampling Program

Collaboration with the SFC has been critical to the success of the portside sampling program. The 11 active SFC mid-water trawl vessels represent a significant portion of the Atlantic mackerel and herring mid-water trawl fleet. For example, 99% of NEFOP documented mid-water trawl Atlantic mackerel catch by weight in 2010 occurred on vessels that were part of the SFC (2 vessels observed in 2010 are no longer active). A fleet communication system was created in October 2010; vessels notify the MA DMF and SMAST through their shipboard e-mail system of their departure and landing times, hail weights and landing ports. Notification of landing times and other information allows portside samplers to easily meet vessels at ports and sample entire offloads. Additionally, captains voluntarily complete MA DMF trip logs that reveal tow locations, weights and other information.

The MA DMF port sampling program was a reliable and timely source of catch composition and, in general, the proximity of tows within a trip or the lack of bycatch made trip level catch information equivalent to tow by tow information. Coordination between the MA DMF and the NEFOP has maximized the number of trips observed and the speed of information exchange with the added ability to address uncertainties created by trip level catch information. Without the higher coverage rates of the portside sampling program the second highest catch of alosines observed during the winter 2011 avoidance system would have gone unnoticed. Without the tow by tow information of the NEFOP, a low bycatch area would have been misclassified as a high bycatch area.

The MA DMF completed a pilot comparison of NEFOP sea sampling estimates of river herring bycatch to portside sampling estimates. This study was presented to the Atlantic herring Plan Development Team (PDT) and, in contrast to a previous study, found good agreement between portside and at sea estimates (for detailed methods see attached Support Document B). However, this analysis only included 30 co-sampled mid-water trawl trips. Including co-sampled trips since the completion of the study and after June 30, 2012 would make the analysis more robust.

Progress towards Value at Grant Completion: 50% fleet coverage

Since the implementation of the project on October 1, 2010 MA DMF has sampled 13 of the 14 vessels that have landed in Massachusetts ports, and 164 out of 328 trips (as of 5/23/12).

Outreach

Management/Public Presentations

Information gathered by the MA DMF port-sampling program is used to inform MA DMF employees on Regional Councils, Plan Development Teams, and through other decision making avenues.

ASMFC Stock Assessment Overview: River Herring

Introduction

This document presents a summary of the 2012 benchmark stock assessment for alewife and blueback herring, collectively referred to as river herring. The assessment was peer-reviewed an independent panel of scientific experts through the Atlantic States Marine Fisheries Commission's (ASMFC) External Peer Review process. This assessment is the latest and best information available on the status of the Atlantic river herring fisheries management.

Management Overview

The Fishery Management Plan (FMP) for Shad and River Herring was one of the very first FMPs developed at the ASMFC in 1985. In 1994, the Shad and River Herring Management Board determined that the FMP was no longer adequate for protecting or restoring the remaining shad and river herring stocks. Amendment 1 was adopted in 1998 and required specific American shad monitoring programs, as well as recommended fishery-dependent and independent monitoring programs for river herring and hickory shad, in order to improve stock assessment capabilities.

In 2009, the Shad and River Herring Management Board approved Amendment 2, which strengthened river herring management. The Amendment prohibits state waters commercial and recreational fisheries beginning January 1, 2012, unless a state or jurisdiction has a sustainable management plan reviewed by the Technical Committee and approved by the Management 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 river herring fisheries meet this new definition of sustainability through the development of sustainability targets which must be achieved and maintained. Amendment 2 required states to implement fisheries-dependent and independent monitoring programs, and contains recommendations to member states and jurisdictions to conserve, restore, and protect critical river herring habitat. As of January 1, 2012, the Shad and River Herring Management Board approved sustainable fishery management plans for Maine, New Hampshire, New York, North Carolina and South Carolina.

What Data Were Used?

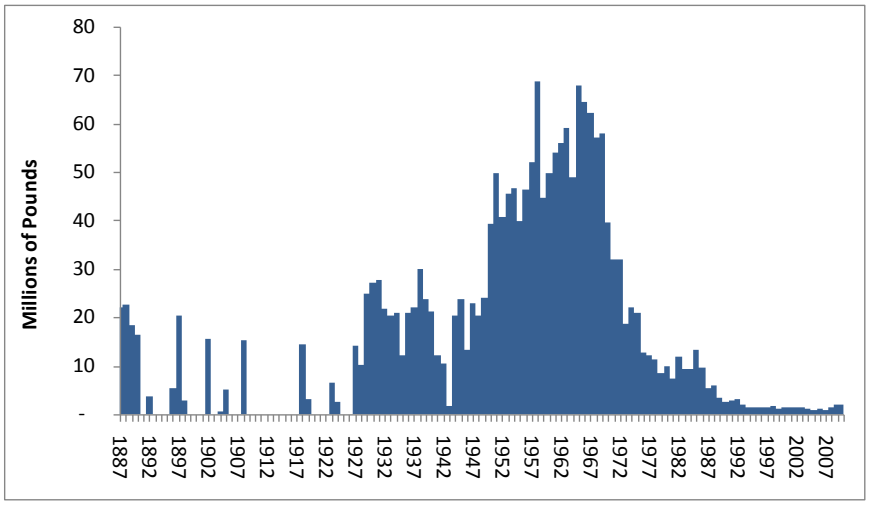
The river herring assessment used both fishery-dependent and -independent data as well as information about river herring biology and life history. Fishery-dependent data come from commercial fisheries that target river herring or catch them incidentally, while fishery-independent data are collected through scientific research and surveys. Data from a total of 57 river systems from Maine through Florida were included in this assessment.

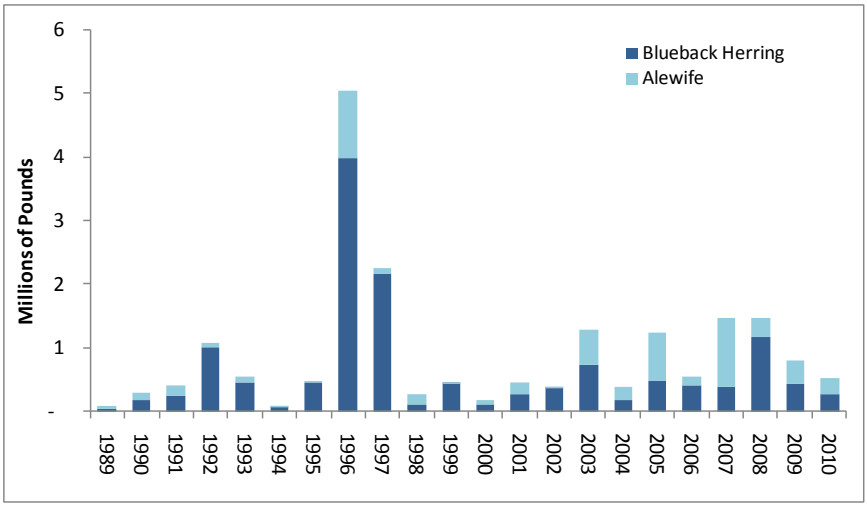
Life History

River herring are anadromous, like salmon, meaning they live in the ocean but spawn in freshwater. River herring spawn in the spring in rivers from Florida through Maine and up into Canada. The newly spawned fish migrate out of the rivers into the ocean in the fall, where they spend the next three to five years of their life. When they are sexually mature, they return to the river where they were born to spawn. Unlike salmon, river herring do not all die after spawning and may return to spawn several times over the course of their lives. The oldest observed ages for river herring are 14 years for alewife and 11 for blueback herring, but the oldest fish seen in rivers today are six to eight years old.

Fishery-Dependent Data

River herring are caught in a number of different fisheries, both as a target species and as bycatch. Because alewife and blueback herring are difficult to tell apart, commercial landings cannot be separated by species and instead are reported here simply as "river herring." The assessment included historical landings back to 1887, although the fisheries that target river herring date back to colonial times. Reported commercial landings of river herring peaked in 1965 and declined steadily and rapidly after that. The earliest years of data are not complete; they include records from only some states and rivers. The quality of the data has improved as reporting requirements have become rigorous. The commercial landings come from a combination of NOAA Fisheries Service port sampling, dealer reports, and fishermen reports. In some river systems, biological samples were available from the commercial catch to describe the age and sex composition. The assessment also examined time-series of commercial catch-per-unit-effort (CPUE), a fishery-dependent index of abundance, from some rivers where consistent measures of effort were available.





Figures 1 & 2. Commercial landings of river herring (combined alewife and blueback herring), 1887 – 2010 (top) and total incidental catch of alewife and blueback herring, 1989 – 2010 (bottom). Note: Only 2005 - 2010 include incidental catch estimates from mid-water trawls.

River herring are also caught as bycatch in ocean fisheries targeting other species such as Atlantic herring and mackerel. This incidental catch may be discarded at sea or retained and landed. Total incidental catch of river herring was estimated from sampling done by at-sea observers.

Although river herring are caught by recreational anglers, both as a target species and as bait for other gamefish like striped bass, there is very little data on recreational landings. The NOAA Fisheries Service Marine Recreational Fishing Statistics Survey, which tracks recreational saltwater landings, rarely encounters anglers fishing for river herring and, as a result, its estimates of recreational landings are highly uncertain and were not used in the assessment.

Fishery-Independent Data

The assessment examined run size indices from five states, young-of-year indices from 10 states, adult net and electrofishing indices from three states, and 19 fishery-independent trawl surveys conducted in coastal waters. The fishery-independent data sets represent a relatively short time series, compared to the long history of the fishery, and all of them were initiated after the peak and sharp decline in landings.

The run size indices are counts of river herring using fish passage or being lifted at dams. For some rivers, the counts represent the entire run. For other rivers, the counts represent an unknown fraction of the total run size, as not all the fish that return to the river to spawn utilize the available fish passage. Run size indices were only available for states in New England.

Young-of-year (YOY) indices track the relative abundance of river herring spawned each year and are conducted in rivers and bays. YOY indices were available for Maine through North Carolina.

State fishery-independent trawl surveys were conducted in nearshore coastal waters and bays and track the abundance of juvenile and adult fish. The NOAA Fisheries Service Northeast Fisheries Science Center bottom-trawl survey had the widest geographic range of the available trawl surveys, sampling both inshore and offshore waters from Massachusetts to North Carolina.

What Models Were Used?

River herring were assessed on a river-by-river basis where the data were available. For the vast majority of rivers, the data were not available to conduct a model-based stock assessment. Instead, trend analysis was used to identify patterns in the available fishery-dependent and -independent data sets. For three rivers – the Monument River in Massachusetts, the Nanticoke River in Maryland, and the Chowan River in North Carolina – data were available to construct statistical catch-at-age models. Spawning stock biomass per recruit analysis was used to calculate benchmarks for total mortality (Z), which were compared to estimates of Z from the observed age structure of adult alewife and blueback herring for rivers where those data were available.

State	River	Status Relative to Historic Levels/Recent Trends
ME	Damariscotta	Depleted[A], Stable[A]
	Union	Increasing[A] , Stable[A]
NH	Cocheco	Unknown[A,B], Stable[A,B]
	Exeter	Depleted[A], Increasing[A]
	Lamprey	Depleted[A], Unknown[A]
	Oyster	Depleted[B], Stable[B]
	Taylor	Depleted[B], Decreasing[B]
	Winnicut	Depleted[A,B], Unknown[A,B]
MA	Mattapoisett	Depleted[A], Unknown[A]
	Monument	Depleted[A], Unknown[A]
	Parker	Depleted[A], Unknown[A]
	Stony Brook	Depleted[A], Unknown[A]
RI	Buckeye	Depleted[A], Unknown[A]
	Gilbert	Depleted[A], Decreasing[A]
	Nonquit	Depleted[A], Decreasing[A]
CT	Connecticut	Depleted[B], Decreasing[B]
NY	Hudson	Depleted[A,B], Stable[A.B]
MD, DE	Nanticoke	Depleted[A,B], Decreasing[A,B]
VA, MD, DC	Potomac	Depleted[A,B], Unknown[A,B]
NC	Chowan	Depleted[A,B], Stable[A.B]
SC	Santee-Cooper	Depleted[B], Increasing[B]

Table 1. Status of select alewife and blueback herring stocks along the Atlantic coast. Status relative to historic levels is pre-1970. Recent trends reflects last ten years of data. A = Alewife only; B= Blueback herring only; A,B = Alewife and blueback herring by species

The assessment also attempted to model the coastwide population using a Depletion-Based Stock Reduction Analysis (DBSRA). This model was developed to estimate management parameters for data-poor stocks by determining what the unfished population size had to have been in order to sustain the observed catches without going extinct. However, the Peer Review Panel determined the reference points produced by the model were not credible and the model required further development before it was appropriate for management use.

What is the Status of the Stock?

Of the 52 stocks of alewife and blueback herring for which data were available, 23 were depleted relative to historic levels, one stock was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short.

Estimates of abundance and fishing mortality could not be developed because of the lack of adequate data. The "depleted" determination was used instead of "overfished" and "overfishing" because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but also habitat loss, predation, and climate changes.

Data and Research Needs

Efforts to assess the status of river herring on the Atlantic coast are hampered by a lack of data. The stock assessment identified a number of high priority research needs.

Estimates of total catch of river herring need to be improved through expanded observer and port sampling coverage to quantify additional sources of mortality, including bait fisheries and incidental catch in other fisheries. Genetic analysis and other techniques are needed to determine population stock structure along the coast and to quantify which stocks are impacted by mixed stock fisheries (including bycatch fisheries).

To reduce uncertainty in age determination, current ageing techniques for river herring should be assessed and validated using known-age fish, scales, otoliths and spawning marks. Ideally, states should conduct biannual aging workshops to maintain consistency and accuracy in ageing fish sampled in state programs.

Monitoring protocols and analyses should be developed and implemented to determine river herring population responses and targets for rivers undergoing restoration (dam removals, fishways, supplemental stocking, etc.), as well as to quantify and improve fish passage efficiency and support the implementation of standard practices.

Glossary

Age class: all of the individuals in a stock that were spawned or hatched in the same year. This is also known as the year class or cohort.

Catch-at-age: the number of fish of each age that are removed in a year by fishing activity.

Fishing mortality (F): the instantaneous (not annual) rate at which fish are killed by fishing

Natural mortality (M): the instantaneous (not annual) rate at which fish die because of natural causes (predation, disease, starvation, etc)

Spawning stock biomass per recruit analysis: an expanded form of yield per recruit analysis that incorporates maturity and fecundity information. These models provide a group of reference points that define the amount of spawning biomass to preserve to ensure a population can replace itself.

Statistical catch-at-age (SCAA) model: an age-structured stock assessment model that works forward in time to estimate population size and fishing mortality in each year. It assumes some the catch-at-age data have a known level of error.

References

ASMFC. 2012. River Herring Stock Assessment Report for Peer Review. Atlantic States Marine Fisheries Commission, Stock Assessment Report No. 12-2 (supplement), 1049 p.

ASMFC. 2009. Guide to Fisheries Science and Stock Assessments. Washington, DC. http://www.asmfc.org/publications/GuideToFisheriesScienceAndStockAssessments.pdf

Council staff requested that NERO staff Run several simulated caps to examine recent catch amounts from a cap perspecitive as well as the recent CVs.

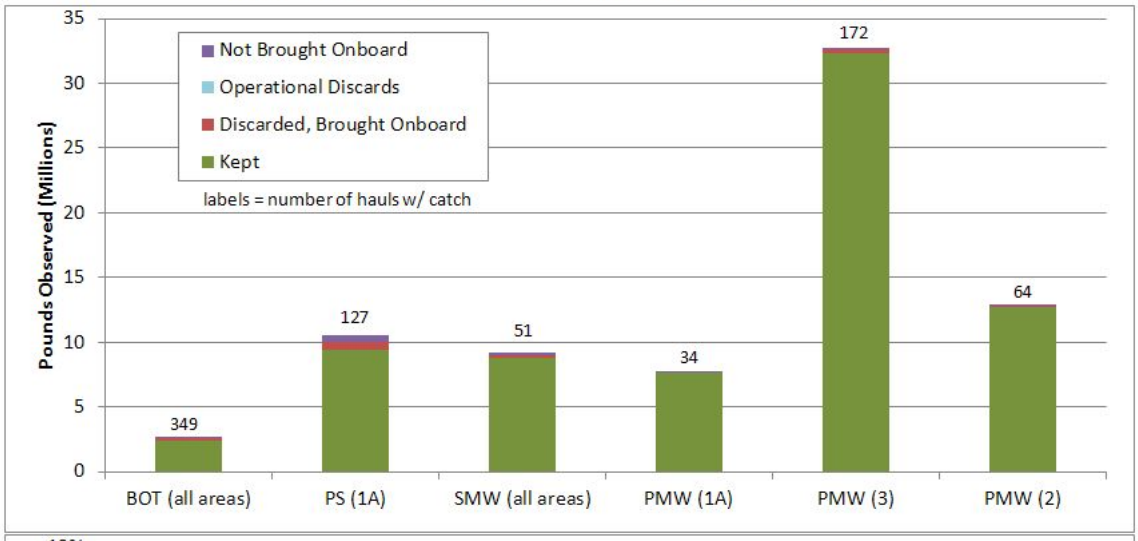
Run 1	**2011 river herring catch for trips with longfin ≥ 2500 lb**		**CV**
Longfin	32,820,353	Total kept_all from n = 1326 dealer trips	
RH	0.00137	2011 catch rate from n = 148 observed trips	
	44,812	Estimated river herring catch	0.42591
Run 2	**2010 river herring catch for trips with mackerel ≥ 20,000 lb**		
Mackerel	34,904,581	Total kept_all from n = 78 dealer trips	
RH	0.00500	2011 catch rate from n = 20 observed trips	
	174,643	Estimated river herring catch	0.49457
Run 3	**2009 river herring catch for trips with mackerel ≥ 20,000 lb**		
Mackerel	68,799,229	Total kept_all from n = 161 dealer trips	
RH	0.00267	2011 catch rate from n = 17 observed trips	
	183,501	Estimated river herring catch	0.65875

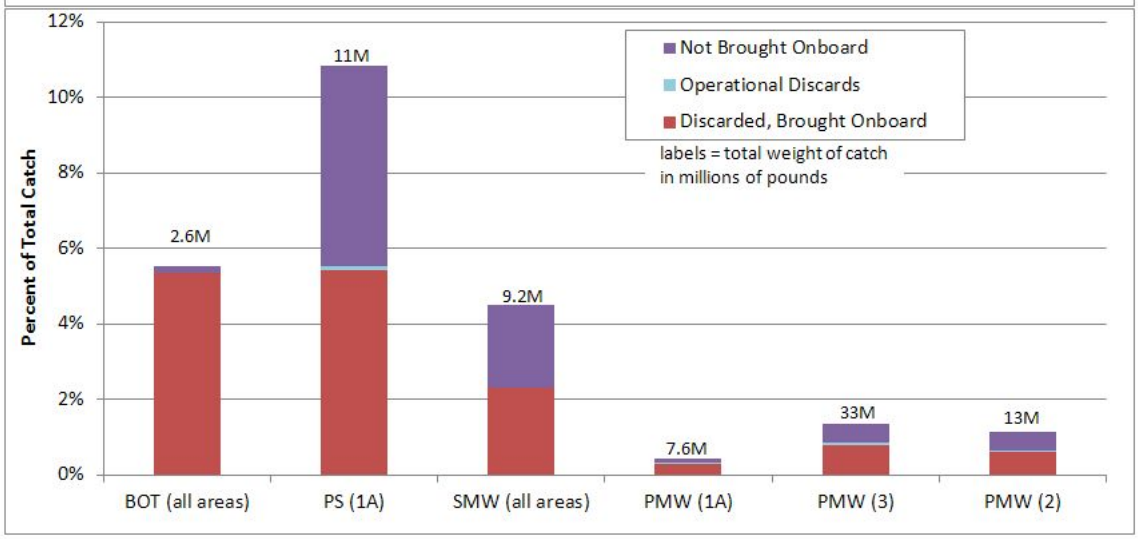
River herring includes alewife (nespp3 = 001) and blueback herring (nespp3 = 112)

Report run on May 29, 2012

	NEFOP final data; 2010 catch for all trips following mackerel definition from J. Didden on paired and single mid water vessels only			
	Data are agregated over 8 trips, from 5 vessels that met the definition, for confidentiality purposes			
NESPP4	COMNAME	FISHDISP	FISHDISPDESC	SUM(HAILWT)
1120	HERRING, BLUEBACK	100	KEPT, GENERAL	702
1685	HERRING, ATLANTIC	001	NO MARKET, REASON NOT SPECIFIED.	4000
1685	HERRING, ATLANTIC	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	3.6
1685	HERRING, ATLANTIC	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	100
1685	HERRING, ATLANTIC	048	NOT BROUGHT ON BOARD, VESSEL CAPACITY FILLED	175
1685	HERRING, ATLANTIC	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	200
1685	HERRING, ATLANTIC	100	KEPT, GENERAL	3306139
2120	MACKEREL, ATLANTIC	001	NO MARKET, REASON NOT SPECIFIED.	300
2120	MACKEREL, ATLANTIC	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	4.6
2120	MACKEREL, ATLANTIC	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	50
2120	MACKEREL, ATLANTIC	048	NOT BROUGHT ON BOARD, VESSEL CAPACITY FILLED	175
2120	MACKEREL, ATLANTIC	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	100
2120	MACKEREL, ATLANTIC	100	KEPT, GENERAL	2020589
3474	SHAD, AMERICAN	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	1.6
3474	SHAD, AMERICAN	100	KEPT, GENERAL	1134
3521	DOGFISH, SPINY	001	NO MARKET, REASON NOT SPECIFIED.	24312.5
3521	DOGFISH, SPINY	025	REGULATIONS PROHIBIT ANY RETENTION.	338
3521	DOGFISH, SPINY	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	25
3521	DOGFISH, SPINY	100	KEPT, GENERAL	2784
4180	BASS, STRIPED	001	NO MARKET, REASON NOT SPECIFIED.	8
4180	BASS, STRIPED	043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR	12
4180	BASS, STRIPED	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	10
5090	HAKE, SILVER (WHITING)	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	10
5090	HAKE, SILVER (WHITING)	100	KEPT, GENERAL	8065
5260	FISH, NK	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	5000
5260	FISH, NK	043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR	100
5260	FISH, NK	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	6265
5260	FISH, NK	099	DISCARDED, OTHER	1000
5260	FISH, NK	110	KEPT, TRANSFERRED TO ANOTHER VESSEL	136000
6600	HAKE, NK	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	25
8010	SQUID, ATL LONG-FIN	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	3
8010	SQUID, ATL LONG-FIN	100	KEPT, GENERAL	1681

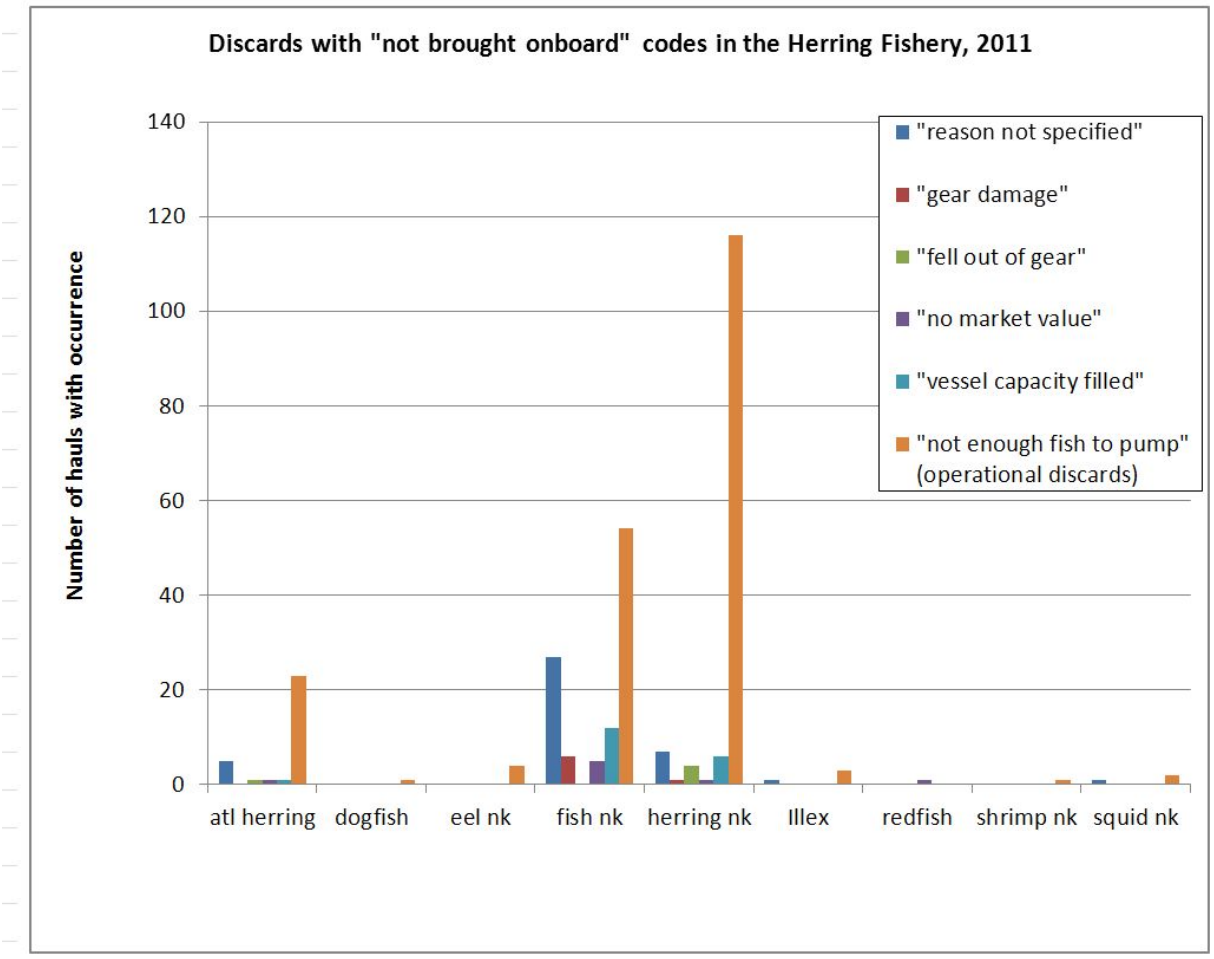
2011 Declared Herring Trips, all hauls from observed trips

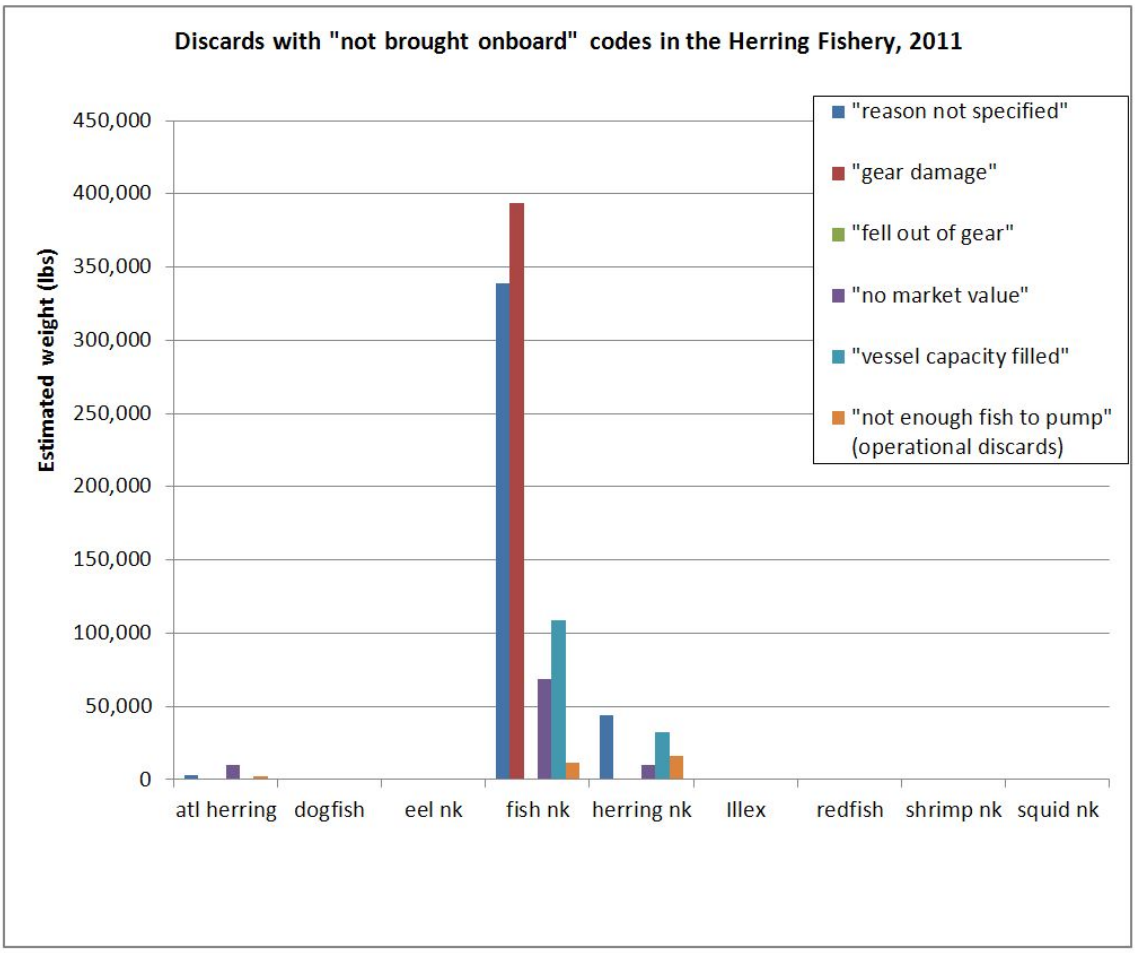




BOT = Bottom Otter Trawl
PS = Purse Seine
SMW = Single Mid-Water Trawl
PMW = Paired Mid-Water Trawl

2011 Declared Herring Trips, all hauls from observed trips





total atlantic herring landed = 68,334,102 lbs

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | Toll Free: 877-446-2362 | FAX: 302-674-5399 | www.mafmc.org
Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

Amendment 14, Appendix 12 - Responses to Comments

Appendices 8, 9, and 10 contain the public comments that were received on the DEIS, both written and via public hearings. Responses to those comments follow below. The Council received many similar comments so there is not a response for every individual comment but the various comments and responses below cover the substantive comments that were received. In general, the Council received and considered the comments from the public as part of its decision-making process for Amendment 14.

1: Many commenters voiced strong support for rigorous catch monitoring in the Mackerel, Squid, and Butterfish (MSB) fisheries and vigorous protection for River Herrings and Shads (RH/S), including direct Council/Federal management of RH/S stocks (also known as the "stock in the fishery" issue).

The preferred alternatives in the Amendment are designed to create a rigorous system to monitor RH/S and other incidental catch that occurs in the MSB fisheries through vessel reporting, dealer reporting, and at-sea observations measures. The MSB fisheries are the fisheries under the Council's control that appear to have substantial RH/S catch. The Council has also recommended mortality caps to directly limit the catch of RH/S that occurs in the mackerel fishery, which appears to be the particular MSB fishery that accounts for most RH/S catch within the MSB fisheries. The implementation of the cap will occur via the 2014 annual specifications package and may include a combined RH/S cap if the available data is insufficient to support separate river herring and shad caps (additional caps could be frameworked). The Council decided that the question of direct Council/Federal management of RH/S stocks would most appropriately be considered in a separate Amendment, and Amendment 15 has already been commenced to fully consider this question given the complex issues involved in RH/S management, including inter-agency coordination.

2: Many commenters supported 100% at-sea monitoring of mid-water trawl fishing trips and measures to discourage slippage on observed trips, which is when catch in a net is released in the water prior to being observed by the observer.

The preferred alternatives in the Amendment would require 100% observer coverage of mid-water trawl (MWT) mackerel trips (5b4) as well as tiered coverage levels for small mesh bottom trawl mackerel trips (100% for Tier 1, 50% for Tier 2, and 25% for Tier 3) (5c4) along with requiring mackerel vessels to pay $325 when they carry observers to help fund the desired coverage levels (5f). The Council cannot mandate coverage of all trips using a particular gear - it can only regulate the fisheries for which it has authority. Unless safety, mechanical, or spiny dogfish issues make it inappropriate, the longfin squid and mackerel limited access vessels would not be able to release hauls of fish ("slippage") prior to observer documentation, and catch affidavits would have to be completed for any pre-observed net release (3j). For mackerel limited access vessels, there would also be a fleet-wide cap of 10 slippages. Slippages due to several exigent circumstances (safety, mechanical failure, and dogfish) would not count.

3: Many commenters recommended that the post-closure mackerel trip limit should be lowered to ensure directed mackerel fishing totally ceases in the event a RH/S mortality cap closes the fishery and/or that the monitoring requirements in the Amendment that are based on a directed mackerel trip definition of 20,000 pounds apply instead to trips over 2,000 pounds.

The implementation of the cap will occur via the annual specifications, and the appropriate post-closure trip limits will be considered and implemented at that time. Directed trip definitions may be altered via frameworks or annual specifications and fishery performance is reviewed each year by Council and NMFS staff. The 20,000 pound trip definition accounts for nearly all mackerel landings, and a 2,000 pound threshold would be out of the scope of the DEIS and require a supplemental EIS and additional comment period.

4: Many commenters recommended that one observer be assigned to each vessel during pair-trawl operations. Comments were also received recommending that for the preferred alternative 3d (one observer on each pair-trawler), the "wherever/whenever possible" discretion be removed because the majority of "unknown fish" records are associated with pair trawling when only one observer is available.

The Council recommended 3d as the preferred alternative. The Council was informed by NMFS that the observer program needed this discretion for occasional circumstances (e.g. one vessel is definitely not taking fish) but that the standard protocol now in place is to have one observer on each vessel if a pair-trawling operation is going to be observed.

5: Many commenters recommended a requirement to weight all catch.

The Council recommend this in the preferred alternatives (applies to directed mackerel and longfin landings) but did provide an exemption that dealers who cannot weigh all catch could use volumetric conversions and would have to describe "Why not?" in their dealer applications so that the issue can continue to be analyzed. If dealers do not sort by species before weighing, they would also have to document with each transaction how they determined the relative composition of a mixed catch. The relevant documentations would enable further exploration of dealer reporting issues in the future even if not used for immediate catch monitoring.

6: Comments were received regarding monitoring and catch control in the Atlantic Herring fishery.

The Council does not manage Atlantic Herring, but Amendment 5 to that fishery management plan is considering similar provisions.

7: Many comments expressed strong concern for the depleted status of RH/S stocks despite inland restoration efforts, and the potential for negative impacts from trawling.

This concern was one of the reasons the Council began and acted on Amendment 14. Amendment 14 will provide better data on the extent of impacts from trawling in the MSB fisheries (which could assist future management) and the mortality caps will provide a mechanism to directly limit the catch of RH/S in the mackerel fishery, which catches the vast majority of RH/S in the MSB fisheries.

8: Many commenters requested that the Council consider the important role of RH/S in the ecosystem (including role and value as forage fish).

The Council is aware of the important role of RH/S in the ecosystem and used the provisions in the Magnuson-Stevens Act allowing conservation of non-target species while considering their role in the ecosystem as part of the authority for the Council's actions.

9: Many commenters requested that the Council consider impacts on future generations.

The Council considers both short and long-term impacts when making decisions.

10: A comment was received to use a catch-share system to manage RH/S.

Catch share systems are part of a limited-access system, which does not currently exist for RH/S.

11: Various comments were received recommending no action on all alternatives and that existing measures were sufficient to monitor RH/S catch and/or that various measures were unaffordable or would put vessels out of business.

Analysis in the amendment suggested that the status-quo measures can result in imprecise RH/S incidental catch estimates and the preferred alternatives are designed to improve those estimates and allow the Council to directly control RH/S catch in the mackerel fishery. RH/S assessments have identified at-sea catch as one issue among many likely contributing to RH/S stocks' depleted status and at-sea catch is the only area where the Council currently has authority. Several of the preferred alternatives were modified to mitigate fishery participant impacts (e.g. $325 observer charge versus $800 or $1,200) and the overall suite of preferred alternatives is designed to get good data and reduce RH/S catch.

12: Comments were received opposing and supporting 2b, which would require MSB dealers to obtain vessel confirmations of SAFIS transactions for MSB species.

The Council did not select 2b as preferred. The mechanisms and procedures for reporting confirmations were deemed insufficiently developed to make this alternative practicable.

13: Comments were received recommending that all mackerel and longfin landings be weighed and reported daily (not just trips meeting directed trip definition).

This was not in the scope of actions considered in the DEIS but could be considered in a future action.

14: Comments were received opposing 2g, which would allow dealers to use volume to weight conversions.

The Council selected 2g as preferred to mitigate the high costs some dealers might incur if they have to physically weigh all catch. Dealers would have to document their practices which would allow further examination of the issue in the future.

15: Comments were received supporting requirements to reasonably assist observers.

These are included in the preferred alternatives.

16: Comments were received supporting requirements to require "released catch affidavits" from captains when hauls are released/slipped prior to being observed and that it was important for vessels to have the ability to slip due to exigent circumstances (safety, mechanical failure, and dogfish)

These are included in the preferred alternatives.

17: Comments were received opposing measures to require all fish to be brought on board or to require trip termination due to a slippage event because of safety issues.

The preferred alternative does include a slippage cap that can result in subsequent trip terminations; however slippage due to certain to exigent circumstances (safety, mechanical failure, and dogfish) would not count against the cap. "Operational discards" would also be an exempted slippage circumstance

18: Comments were received that supported potential future actions based on the SFC/SMAST/MA-DMF avoidance project but opposed other port-side monitoring requirements. Comments were also received opposing total reliance on this voluntary project for RH/S catch minimization.

This is the approach the Council took regarding port-side monitoring via the preferred alternatives 4a and 4f, but the Council also included other alternatives to address RH/S catch in other alternative sets.

19: Comments were received opposing industry-funded observer coverage in the longfin squid fishery but endorsing industry funding of 100% observer coverage in the mackerel fishery up to $325/day as long as the program was revisited after 2 years. The comments also noted that waivers for situations when observers are not available are necessary to avoid missing trips due to observer placement issues.

This is essentially the approach the Council took via the preferred alternatives 5b4, 5c4, 5f, and 5h. The Council specified that the lower tier mackerel vessels would have lower coverage levels.

20: Comments were received opposing implementation of catch caps due to the inability to quantitatively and causally link incidental catch levels with RH/S population trends.

The Council will consider a range of RH/S catch caps through the annual specifications process so as to minimize catch to the extent practicable. While the RH/S assessments have not identified fishing mortality reference points, they did conclude that ocean catch is one of a number of factors that likely need to be addressed.

21: Comments were received opposing area-based restrictions.

The Council made area-based restrictions to conserve RH/S frameworkable but decided that area-based restrictions were not appropriate given the currently available information.

22: Comments were received opposing adding RH/S as federally managed "stocks in a fishery."

The Council has moved consideration of this issue to Amendment 15 so that the complex issues associated with Council/Federal RH/S management may be more fully explored and analyzed.

23: Comments were received that supported requiring all catch on mackerel and longfin squid trips to be made available to observers unless exigent circumstances (emergencies like safety, mechanical failure, dogfish) made such practices infeasible, and supported a slippage cap whereby vessels would have to terminate a trip if they slipped for a non-emergency reason once the cap had been reached fleet-wide.

This is the approach selected as preferred by the Council (3j and 3l) for mackerel. For longfin squid trips, the same would apply except there would not be a cap. Slippage events would be tracked and future actions could be taken if necessary in the longfin squid fishery.

24: Comments were received that supported requiring terminated trips to take an observer on their next trip.

The Council determined that the trip termination provision was a sufficient deterrent against slippage. If trip termination patterns suggest additional actions are necessary then future actions could be considered.

25: Comments recommended that 100% of Tier 1 and Tier 2 mackerel vessels that use small mesh bottom trawl gear be observed, that 25% of Tier 3 mackerel vessels that use small mesh bottom trawl gear be observed, that 50% of longfin squid trips that use small mesh bottom trawl gear be observed, and that vessels be required to pay for observer coverage that cannot be funded directly by NMFS.

The Council selected a similar approach for mackerel except that 50% of Tier 2 vessels would be observed to account for their more limited role in the mackerel fishery. Since recently higher coverage levels in the longfin squid fishery (10%-15%) have continued to show relatively low RH/S catches the Council did not include observer coverage measures directed at the longfin squid fishery. The Council selected an industry funding amount of $325 per trip as being practicable for industry, as supported by the trip cost analysis in the EIS.

26: Comments recommended several "hotspot" or area-based restrictions or that area-based RH/S measures be consistent between the New England and Mid-Atlantic Fishery management Councils.

The analysis in the EIS did not suggest area-based "hotspot" restrictions would likely be effective but implementation of such caps was made frameworkable in case new information becomes available that suggested such measures would be effective and practicable.

27: Comments requested that any increased observer coverage rates not "sunset" or expire at a fixed point in time.

The preferred alternative (5h) specifies that the coverage rate will be reevaluated but changes (down or up) would have to occur through a subsequent action.

28: Comments requested that larger area-based closures be made frameworkable.

Framework actions are used to adjust existing measures and large-scale area closures would not be candidates for initial implementation via a framework action.

29: Comments requested that catch caps for RH/S be implemented in 2013 for the mackerel fishery.

RH/S catch caps were selected as preferred alternatives but the timeline for implementation does not allow for implementation before January 1, 2014.

30: Comments requested that observer coverage be increased to adequately cover gear types, range, and seasonality of MSB fisheries to 100% monitoring for large vessels and below .3 CV for SMBT. Combinations of observers, portside, and (ultimately) electronic monitoring should be considered to provide the most statistically valid and cost-effective data.

Electronic monitoring was not within the scope of the DEIS but could be considered in the future. The preferred alternatives recommend 100% at-sea monitoring for the larger mackerel vessels and lower coverage rates for vessels that do not participate as much. Since recently higher coverage levels in the longfin squid fishery (10%-15%) have continued to show relatively low RH/S catches the Council did not include observer coverage measures directed at the longfin squid fishery. The Council cannot specify CVs for overall gear types, but it is believed that the preferred specifications will allow greatly increased precision of RH/S catch estimates.

31: Comments suggested that a fleet-area cap (e.g., midwater trawls in Mid-Atlantic) rather than a cap that only uses the regulatory definition of a "Mackerel" or "Herring" trip to define vessels that are subject to the cap would make the most sense.

The NEFMC has begun an action to add a RH/S cap to the Atlantic herring fishery and the respective Council staffs will be investigating the possibilities for any cap to take the nature of the overall fisheries (such as linkages between mackerel and Atlantic herring) into account.

32: Comments requested that that as many provisions as possible be frameworkable or handled in specifications to allow for adaptive management to meet the goal of reducing catch and increasing RH/S populations.

The Council made a number of actions frameworkable and the MSB FMP generally provides for substantial regulatory flexibility via the annual specifications process.

33: One comment noted that the DEIS for Amendment 14 did not contain the latest river herring stock assessment information, which was finalized after the DEIS was drafted.

The new river herring stock assessment information has been added to the FEIS.

34: Comments requested that the observer coverage level recommendations be modified such that waivers would be prohibited and that states would have to receive full provider certification in order to be providers.

Waivers would only be granted if an observer could not be obtained because of issues with NMFS or an observer provider (i.e. through no fault of the vessel). If excessive waivers become an issue then a framework adjustment could make any necessary changes. The DEIS states that "NMFS could also authorize states as service providers if NMFS and the respective state have a memorandum of agreement (MOA) regarding the collection and handling of data." As the implementing Agency with expertise in the matter, any MOA developed by NOAA should sufficiently establish that state participation would be contingent on acceptable training related to monitoring responsibilities.

35: Commenters noted that 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.

The preferred alternatives focus on reporting and at-sea observing and do not include portside measures.

36: Commenters recommended that 3j should clarify that consistent with the current CA1 sampling regulations, operational discards must be brought aboard for sampling.

The Council received input from industry that fully bringing a net aboard after each haul may not be practical or safe for some vessels and received input from the observer program that operational discards are very small quantities and that fishery participants have been helpful in allowing observers visual access to the cod-end after pumping but before a net is released or re-deployed. Accordingly, the Council selected to exempt minor operational discarding as an event that would count against a slippage cap as long as visual access was provided. The observer program will continue to monitor this issue and corrective action can be taken at a later date if needed.

37: Commenters recommended that the implementing language of when various catch thresholds trigger requirements should also be revised so that the measures apply to trips “fishing for, catching, possessing, transferring, or landing” the specified amount of the target species to be consistent with the Atlantic Herring FMP.

That is consistent with expected implementing language.

38: Many commenters stressed the need to align requirements for mackerel and Atlantic herring fishing given the overlapping nature of these fisheries.

The Council has worked closely with the New England Fishery Management Council and has determined that the preferred measures align with measures proposed for the Atlantic herring fishery to the extent practicable. The Councils will continue to work cooperatively with each other and NMFS to ensure that alignment is achieved where appropriate and possible.

39: Comments were received that opposed VMS and VMS reporting for mackerel or longfin squid boats unless money could be made available to the fleet for the purchase of the equipment as was done by the PFMC several years ago.

Fleet analysis suggests that most mackerel and longfin squid permitted vessels already have VMS requirements. While funding sources are scarce, the Council will investigate if funds to cover the necessary vessels can be found.

40: Comments opposed additional observer coverage on the grounds that additional forced sampling would have a certain and catastrophic net impact on the individual boats and their communities.

The preferred alternatives recommended by the Council limit industry funding to the mackerel fleet at a cost of $325/day. Mid-Water Trawl and Tier 1 mackerel vessels would have 100% coverage, Tier 2 mackerel vessels would have 50% coverage, and Tier 3 mackerel vessels would have 25% coverage. All of these observed vessels would pay $325/day. No additional coverage (or industry funding) was proposed for the longfin squid fleet given its relatively low encounters with RH/S.

41: Comments opposed a river herring cap on the grounds that there was less than one half of one percent of catch of river herring compared to catch in the squid fishery.

No cap is being proposed for the longfin squid fishery (or *Illex* fishery). The preferred alternatives do include a cap for RH/S for the mackerel fishery, which analysis in the amendment identified as having substantial RH/S catch in at least some years.

42: Comments opposed industry-funded 3rd party port-side landings sampling programs for mackerel and longfin squid vessels and volumetric vessel-hold certification for longfin squid moratorium permits.

These alternatives were not selected as preferred.

43: Comments were received that supported 25% of mackerel trips to carry observers.

Due to the high-volume nature and patchy distribution of RH/S catch, the Council selected preferred alternatives that would require higher levels of observer coverage for the mackerel fishery with a reevaluation occurring once the higher coverage levels have been in place for two years.

44: Comments were received that supported 100% observer coverage.

The Council selected preferred alternatives that would require 100% observer coverage for the most active mackerel participants, which analysis suggested would account for most incidental catch of RH/S. Lower levels of coverage were recommended for less active participants.

45: Comments were received that suggested everyone should have the same reporting requirements.

For the fisheries that appear to catch RH/S (mackerel and longfin squid) that the Council manages, the preferred alternatives should improve managers' abilities to accurately estimate RH/S catches. The Council has also been coordinating with the New England Fishery Management Council in order to align the mackerel and Atlantic herring fisheries as much as is appropriate.

46: Comments were received that the data does not appear ready to support caps.

With the higher levels of observer coverage recommended, relatively precise estimates of RH/S catch should be able to be made. However, it is true that linkages (if any) between RH/S catches in the MSB fisheries and RH/S stock trends are not understood. Precision estimates will be generated for the cap estimates regardless of the achieved level of observer coverage.

47: Comments were received that increased observer coverage needs to be considered relative to costs.

The Council selected preferred alternatives that would require 100% observer coverage for the most active mackerel participants, which analysis suggested would account for most incidental catch of RH/S. Lower levels of coverage were recommended for less active participants and $325 dollars would be paid by vessels toward observer costs.

48: Comments were received that recommended a 25-miles buffer zone from the coast out (entire coast).

Area-based management was generally not selected as preferred because of the difficult-to-predict effort shifts that can occur (which can potentially lead to even greater bycatch). The wide spring distributions of river herrings and American shad beyond 25 miles (see Figures 14-16 in Appendix 1), and the frequent fishery interactions with RH/S beyond 25 miles (see figures 23-48 in Appendix 2) also do not support a 25-mile no-fishing zone as a solution to RH/S catch issues. As implementation of Amendment 14 proceeds, RH/S catch will be monitored and additional measures such as a buffer could be considered in the future if the best available scientific information supports such measures.

49: Comments were received that suggested that direct Council/Federal management would require 1000s of plans because each river & creek is its own stock and you will have to have a plan for each river.

The Council will be examining the issues related to direct Council/Federal management of RH/S via Amendment 15.

50: Comments were received that suggested that RH/S face major habitat impediments and this should be the focus of recovery efforts, that a variety of state-level of efforts are underway, and that commercial fishermen are being blamed when there are other culprits.

The Council is aware that RH/S face a variety of challenges that are likely keeping them in a depleted state, including habitat issues. The Council will be investigating the appropriateness of getting more generally involved in RH/S management in Amendment 15, and in Amendment 14 the Council is trying to address getting good data on RH/S catch in the MSB fisheries and minimizing RH/S catch in the MSB fisheries to the extent practicable.

51: Comments were received that the Council does not know the likely impacts of the actions, that cormorant feeding is far surpassing fishing mortality of RH/S, that there is no information about how much RH/S are taken out of rivers, and that since there is no incentive to catch RH/S that a lot of the desired minimization has already taken place.

The Council is aware that RH/S face a variety of challenges that are likely keeping them in a depleted state, including predation. While it may be true that there is minimal incentive to catch RH/S, substantial amounts of RH/S have been observed in the MSB fisheries in at least some years. Most states have moved to moratoriums on RH/S catch so in-river catch has been greatly reduced. In Amendment 14 the Council is trying to address getting good data on RH/S catch in the MSB fisheries and minimizing RH/S catch in the MSB fisheries to the extent practicable.

RECORD OF DECISION

FINAL ENVIRONMENTAL IMPACT STATEMENT

AMENDMENT 14 TO THE ATLANTIC MACKEREL, SQUID, AND BUTTERFISH FISHERY MANAGEMENT PLAN

National Marine Fisheries Service
Northeast Region

This document comprises the record of decision (ROD) for approval/disapproval of Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB 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 14 Final Environmental Impact Statement (FEIS) and all other decision and analytical documents prepared for this action.

Background

On June 9, 2010 (75 FR 32745), the Mid-Atlantic Fishery Management Council (Council) published a notice of intent (NOI) to prepare an EIS for Amendment 14 to MSB FMP (Amendment 14) to consider measures to: Implement catch share systems for the squid fisheries; increase fishery monitoring to determine the significance of river herring and shad incidental catch in the MSB fisheries; and measures to minimize bycatch and/or incidental catch of river herring and shad. The Council subsequently conducted scoping meetings during June 2010 to gather public comments on these issues. Based on the comments submitted during scoping, the Council removed consideration of catch shares for squids from Amendment 14 at its August 2010 meeting.

Following further development of Amendment 14, the Council published a Notice of Availability (NOA) for the draft EIS (DEIS) on April 20, 2012 (77 FR 23713), and conducted Magnuson-Stevens Fishery Conservation and Management Act (MSA) and NEPA public hearings in April and May 2012. After the public comment period on the DEIS that ended on June 4, 2012, the Council adopted Amendment 14 on June 14, 2012. The Council submitted Amendment 14 to NMFS for review on February 26, 2012. Following a series of revisions, the Council submitted a revised version of Amendment 14 to NMFS on June 3, 2013.

An NOA for the FEIS was prepared for Amendment 14, as required by NEPA, and published on August 16, 2013, (78 FR 50054). The comment period end date was incorrectly listed in the initial notice, so a correction was published on August 23, 2013 (78 FR 52524), amending the comment period end date to September 16, 2013. In addition, as required by the MSA, an NOA for Amendment 14 was published in the Federal Register on August 12, 2013 (78 FR 48852), and a proposed rule was published on August 29, 2013 (78 FR 53404). The comment period on both the MSA NOA and the proposed rule ended on October 11, 2013.

The following sections briefly describe the alternatives considered in Amendment 14 and the measures adopted by the Council as part of Amendment 14. 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 14

The Council developed Amendment 14 to improve catch monitoring for the Atlantic mackerel, squid, and butterfish fisheries and to address incidental catch of river herring and shad through responsible management. The Amendment 14 FEIS described and analyzed alternatives to address these issues. These alternatives are organized into sets, which are briefly summarized below in the order in which they are discussed in the FEIS. See Section 5 of the FEIS for a complete description of the alternatives and see Section 7 of the FEIS for a complete analysis of the alternatives.

Alternative Set 1: Additional Vessel Reporting Measures

Vessel trip reporting requirements – Four alternatives were considered: (1) Institute weekly vessel trip reporting (VTR) for mackerel permits; (2) institute weekly VTR for longfin squid/Butterfish permits; (3) institute weekly VTR for all MSB permits; and (4) maintain the status quo VTR reporting requirement of monthly VTR submissions for all MSB permits except for Tier 3 mackerel permits, which require weekly VTR reporting.

Pre-trip notification requirements – Three alternatives were considered: (1) Require a 48-hour pre-trip notification to retain/possess/transfer over 20,000 lb mackerel; (2) require a 72-hour pre-trip notification to retain/possess/transfer over 20,000 lb mackerel; and (3) maintain the status quo requirement of no pre-trip notification requirement to retain/possess/transfer over 20,000 lb mackerel.

Vessel monitoring system (VMS) requirements – Three alternatives were considered: (1) Require VMS for limited access mackerel vessels; (2) require VMS for longfin squid/butterfish moratorium vessels; and (3) maintain status quo requirement of no VMS for either limited access mackerel or longfin squid/butterfish moratorium permits.

VMS catch reporting requirements – Three alternatives were considered: (1) Require daily VMS reporting of catch by limited access mackerel vessels; (2) require daily VMS reporting of catch by longfin squid/butterfish moratorium vessels; and (3) maintain status quo requirement of no VMS catch reports for limited access mackerel or longfin squid/butterfish moratorium permits.

VMS pre-landing notification requirements – Three alternatives were considered: (1) Require 6 hour pre-landing notification via VMS to land more than 20,000 lb of mackerel; (2) require 6 hour pre-landing notification via VMS to land more than 2,500 lb of longfin squid; and (3) maintain the status quo requirement of no VMS pre-landing report to land more than 20,000 lb of mackerel or 2,500 lb longfin squid.

Alternative Set 2: Additional Dealer Reporting Measures

Seven options were considered: (1) require dealers to obtain vessel confirmation of weight of fish for mackerel landings over 20,000 lb, *Illex* landings over 10,000 lb, and longfin squid landings over 2,500 lb; (2) require MSB dealers to weigh all landings related to mackerel transactions over 20,000 lb and annually document methods used to determine relative species composition; (3) require MSB dealers to weigh all landings related to mackerel transactions over 20,000 lb and document methods used to determine relative species composition with each report; (4) require MSB dealers to weigh all landings related to longfin squid transactions over 2,500 lb and annually document methods used to determine relative species composition; (5) require MSB dealers to weigh all landings related to longfin squid transactions over 2,500 lb and document methods used to determine relative species composition with each report; (6) allow dealers to use volume to weight conversions if they cannot weigh landings; and (7) maintain existing requirement that dealers report the weight of fish.

Alternative Set 3: Additional At-Sea Observation Optimization Measures

At-Sea Sampling Requirements - Four options were considered: (1) Require limited access mackerel and longfin squid/butterfish moratorium vessels to provide reasonable assistance (safe sampling station, help with measuring codends and holding bind, help with fish collection and help with basket sampling) to observers completing their duties; (2) require limited access mackerel and longfin squid/butterfish vessels to notify observers when pumping/haulback occurs; (3) require observers on each vessel fishing cooperatively; and (4) maintain status quo at-sea sampling requirements, which do not require any reasonable assistance provisions, haulback notice, or observers on both vessels fishing cooperatively.

Slippage (catch discarded before it is made available to an observer) Measures – Twelve options were considered: (1) Require released catch affidavits for slippage events from limited access mackerel and longfin squid/butterfish vessels; (2) prohibit slippage on limited access mackerel vessels; (3) prohibit slippage on longfin squid/butterfish moratorium vessels; (4) require trip termination after 1 slipped haul on limited access mackerel and longfin squid/butterfish moratorium vessels; (5) require trip termination after 2 slipped hauls on limited access mackerel and longfin squid/butterfish moratorium vessels; (6) prohibit slippage on limited access mackerel and longfin squid/butterfish moratorium vessels, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel; and require completion of a released catch affidavit when slippage occurs; (7) require trip termination for limited access mackerel vessels after 5 fleetwide slippage events; (8) require trip termination for limited access mackerel vessels after 10 non-exempted fleetwide slippage events; (9) require trip termination for longfin squid/butterfish moratorium vessels after 5 fleetwide slippage events; (10) require trip termination for longfin squid/butterfish moratorium vessels after 10 fleetwide slippage events; (11) require an observer on the next trip if the previous trip is terminated due to slippage; (12) require individual slippage quotas with trip termination for limited access mackerel and longfin squid/butterfish moratorium vessels; and (13) maintain existing allowance for slippage.

Alternative Set 4: Portside and Other Sampling/Monitoring Measures

Portside Sampling Programs – Three alternatives were considered: (1) Require an industry funded portside sampling program for mackerel landings over 20,000 lb; (2) require an industry funding portside sampling program for longfin squid landings over 2,500 lb; and (3) maintain status quo, which is no portside sampling program for mackerel or longfin squid landings.

Vessel hold certification requirements – Three alternatives were considered: (1) Require volumetric vessel hold certification for Tier 3 limited access mackerel permits; (2) require volumetric vessel hold certification for longfin squid/butterfish moratorium permits; and (3) maintain existing vessel hold certification requirements, which are only in place for Tier 1 and 2 limited access mackerel permit holders.

River herring avoidance measures – Two alternatives were considered: (1) support and evaluate an existing research program investing river herring encounters in the herring fishery; and (2) status quo, which means no Council commitment to support and evaluation of this research.

Alternative Set 5: At-Sea Observer Coverage Requirements

Mackerel mid-water trawl observer coverage levels – Five options were considered for midwater trawl trips intending to land over 20,000 lb mackerel: (1) Require 25-percent coverage; (2) require 50-percent coverage; (3) require 75-percent coverage; (4) require 100-percent coverage; and (5) maintain existing Standard Bycatch Reporting Methodology (SBRM) coverage levels, subject to re-prioritization.

Mackerel small mesh bottom trawl observer coverage levels – Five options were considered for small mesh bottom trawl trips intending to land over 20,000 lb mackerel: (1) Require 25-percent coverage; (2) require 50-percent coverage; (3) require 75-percent coverage; (4) recommend 100-percent coverage on Tier 1 limited access mackerel vessels, 50-percent coverage on Tier 2 vessels, and 25-percent coverage on Tier 3 vessels; and (5) maintain existing SBRM coverage levels, subject to re-prioritization.

Longfin squid small mesh bottom trawl observer coverage levels – Five options were considered for trips by vessels intending to land over 2,500 lb longfin squid: (1) Require 25-percent coverage; (2) require 50-percent coverage; (3) require 75-percent coverage; (4) require100-percent coverage; and (5) maintain existing SBRM coverage levels, subject to re-prioritization.

Strata/fleet based observer coverage levels – Five options were considered to reach certain coefficient of variation (CV) levels for alewife and blueback herring catch: (1) Require allocation of seadays on midwater trawl trips to reach a coefficient of variation (CV) of 0.3; (2) require allocation of seadays on midwater trawl trips to reach a CV of 0.2; (3) require allocation of seadays on small mesh bottom trawl trips to reach a CV of 0.3; (4) require allocation of seadays on small mesh bottom trawl trips to reach a CV of 0.2; and (5) maintain existing SBRM coverage levels, subject to re-prioritization.

Funding for Observer Coverage Levels – Three options were considered: (1) Industry contribution of $325 per seaday; (2) a 4-year phase-in of industry funding; and (3) maintain existing Federal funding of all observer coverage.

Process for Review Observer Coverage Levels – Two options were considered: (1) Review in 2 years and (2) maintain existing review of coverage levels through SBRM process.

Alternative Set 6: Mortality Caps

Five options were considered: (1) Implement river herring catch caps for the mackerel fishery; (2) implement shad catch caps for the mackerel fishery; (3) implement river herring catch caps for the longfin squid fishery; (4) implement shad catch caps for the longfin squid fishery; (5) add river herring and shad mortality caps to the list of measures that can be addressed in a framework adjustment; and (5) maintain existing ability to consider river herring catch caps in a future amendment.

Alternative Set 7: Restrictions in areas of high River Herring/Shad catch

Seven alternatives were considered: (1) Close a mackerel river herring/shad management area to directed mackerel fishing during quarter 1; (2) close a longfin squid river herring/shad management area to directed longfin squid fishing year round; (3) require industry-funded observers on directed mackerel trips in mackerel river herring/shad management area; (4) require industry-funded observers on directed longfin squid trip in longfin squid river herring/shad management area; (5) prohibit fishing or require observers only when a "trigger" is reached; (6) update areas via specifications; (7) maintain existing areas related to MSB management, which currently consists of the Exclusive Economic Zone.

Alternative Set 8: Hotspot Restrictions

Six alternatives were considered for River Herring Monitoring/Avoidance areas established through this action: (1) Require industry-funded observers on directed mackerel; (2) require industry-funded observers on directed longfin squid trips; (3) prohibit slippage on mackerel vessels, with exceptions for safety concerns, mechanical failure, and spiny dogfish preventing catch from being pumped aboard the vessel; (4) prohibit slippage on longfin squid vessels, with the same exemptions; (5) make measures effective only when they are effective for Atlantic herring vessels; and (6) maintain existing areas related to MSB management, which currently consists of the Exclusive Economic Zone.

Four alternatives were considered for River Herring Protection areas established through this action: (1) prohibit directed mackerel retention; (2) prohibit directed longfin squid retention; (2) make measures effective only when they are effective for Atlantic herring vessels; and (4) maintain existing areas related to MSB management, which currently consists of the Exclusive Economic Zone.

Finally, two alternatives were considered that would: (1) allow time/area management related to river herring and shad to be address via framework adjustment; and (2) maintain existing ability to consider time/area management in a future amendment.

Other alternatives

Initially, the Council considered alternatives in Amendment 14 DEIS (labeled "Alternative Set 9") intended to add, in a future action, alewife, blueback herring, American shad, and/or hickory shad as stocks in the MSB FMP. Instead, the Council decided that it would initiate a future Council amendment that would consider adding these as stocks in the fishery and analyze all of the MSA provisions (i.e., various management reference points, description and delineation of essential fish habitat (EFH), etc.), and initiated Amendment 15 to MSB FMP to explore the need for conservation and management of these species more thoroughly. Scoping for MSB Amendment 15 began in October 2012 (77 FR 65867).

Based on NMFS guidance, the Council completed a white paper examining the costs and benefits of Federal management for river herring and shad. After reviewing the discussion in the white paper, the Council ultimately determined not to go forward with the development of Amendment 15 at this time, and to re-evaluate Federal management in 3 years after a number of other actions related to river herring and shad conservation have been implemented. NMFS is currently reviewing the Council's decision to cease continuation of the development of a Federal management plan for river herring and shad.

Measures Adopted by the Council

On June 14, 2012, the Council adopted the following measures as part of Amendment 14, after considering recommendations from the MSB Committee, MSB Advisory Panel, and public comment received on the draft EIS.

Alternative Set 1: Additional Vessel Reporting Measures

- Institute weekly VTR for all MSB permits to facilitate quota monitoring and cross-checking with other data sources;
- Require 48-hour pre-trip notification to retain more than 20,000 lb of mackerel to facilitate observer placement;
- Require VMS and daily catch reporting via VMS for limited access mackerel vessels to facilitate monitoring and cross checking with other data sources;
- Require VMS and daily catch reporting via VMS for longfin squid/butterfish moratorium vessels to facilitate monitoring and cross checking with other data sources;
- Require 6-hour pre-landing notification via VMS to land over 20,000 lb mackerel to facilitate monitoring, enforcement, and portside monitoring.

Alternative Set 2: Additional Dealer Reporting Measures

- Require federally permitted MSB dealers to weigh all landings related to mackerel transactions over 20,000 lb and longfin squid transactions over 2,500 lb, and document methods used to determine species composition with each report;
- Allow dealers to use volume to weight conversions if they cannot weigh landings.

Alternative Set 3: Additional At-Sea Observation Optimization Measures

- Expand vessel requirements related to at-sea observer sampling to help ensure safe sampling and improve data quality;

- Prohibit slippage on limited access mackerel and longfin squid trips, 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 fleetwide cap of 10 slippage events for the mackerel fishery and require vessels slipping catch after the cap has been reached to immediately stop fishing and return to port.

Alternative Set 4: Portside and Other Sampling/Monitoring Measures

- Evaluate the existing river herring bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters.

Alternative Set 5: At-Sea Observer Coverage Requirements

- Recommend 100-percent observer coverage on midwater trawl and Tier 1 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Recommend 50-percent coverage on Tier 2 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Recommend 25-percent coverage on Tier 3 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Require an industry contribution of $325 per sea day;
- Re-evaluate observer coverage requirements 2 years after implementation.

Alternative Set 6: Mortality Caps

- Implement a mortality cap for river herring and shad in the mackerel fishery;
- Establish the ability to consider a river herring and shad catch cap in a future framework.

Alternative Set 8: Hotspot Restrictions

- Establish the ability to consider time/area management to mitigate bycatch of river herring and shad in a future framework.

Factors Considered in Making a Decision on the Final Action

CEQ 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 14, 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 MSB FMP is to manage Atlantic mackerel, longfin squid, *Illex* squid, and butterfish fisheries at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The objectives of the MSB FMP are to:

- Prevent the exploitation of these resources from exceeding those levels which reduce the probability of successful (i.e., the historic average) recruitment to the fisheries;
- Promote the growth of the U.S. commercial fishery, including the fishery for export;
- Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of the FMP;
- Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy;
- Increase understanding of the conditions of the stocks and fisheries; and
- Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

The purposes of Amendment 14 are to improve catch monitoring for the Atlantic mackerel, squid and butterfish fisheries, and to address incidental catch of river herring and shad through responsible management.

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 MSB FMP and the purposes of Amendment 14, 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 14 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 9 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 9.2 of the FEIS describes these requirements and the basis for determining that the measures included in Amendment 14 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 14 are described below.

Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, may:

- 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 14 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 14 relative to the laws described below and has determined that the all of the approved Amendment 14 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 10 of the FEIS and in the NMFS Regional Administrator's (RA's) decision memorandum included with this ROD for the approval of Amendment 14.

Decision on the Final Action: Measures Approved/Disapproved in Amendment 14

NMFS approves all measures adopted by the Council in Amendment 14 and listed above, with the following exceptions:

- Require federally permitted MSB dealers to weigh all landings related to mackerel transactions over 20,000 lb and longfin squid transactions over 2,500 lb, and document methods used to determine species composition with each report;
- Allow dealers to use volume to weight conversions if they cannot weigh landings.
- Establish a fleetwide cap of 10 slippage events for the mackerel fishery and require vessels slipping catch after the cap has been reached to immediately stop fishing and return to port.
- Recommend 100-percent observer coverage on midwater trawl and Tier 1 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Recommend 50-percent coverage on Tier 2 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Recommend 25-percent coverage on Tier 3 small mesh bottom trawl trips intending to retain over 20,000 lb mackerel;
- Require an industry contribution of $325 per sea day;
- Re-evaluate observer coverage requirements 2 years after implementation.

The decision to partially approve Amendment 14 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 14 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 14, 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 data collection, reduce catch of river herring and shad, and that can be administered by NMFS. NMFS supports improvements to fishery dependent data collections, either through increasing reporting requirements or expanding the at-sea monitoring of the MSB fisheries. NMFS also shares the Council's concern for reducing bycatch and unnecessary discarding.

However, the requirements for increased observer coverage for mackerel midwater trawl and small mesh bottom trawl trips, 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 14 on June 14, 2012. The proposed rule for Amendment 14 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 14.

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.

Alternative Set 1: Additional Vessel Reporting Measures

VTR Frequency Requirements

Currently MSB permit holders are required to submit fishing vessel logs, known as VTRs, on a monthly basis. Amendment 14 would implement a weekly VTR submission requirement for all MSB permits. This measure requires that VTRs be postmarked or received by midnight of the first Tuesday following the end of the reporting week. If an MSB permit holder did not make a trip during a given reporting week, a vessel representative is required to submit a report to NMFS stating so by midnight of the first Tuesday following the end of the reporting week. Any fishing activity during a particular reporting week (i.e., starting a trip, landing, or offloading catch) constitutes fishing during that reporting week and eliminates the need to submit a negative

fishing report to NMFS for that reporting week. For example, if a vessel began a fishing trip on Wednesday, but returned to port and offloaded its catch on the following Thursday (i.e., after a trip lasting 8 days), the VTR for the fishing trip would need to be submitted by midnight Tuesday of the third week, but a negative report (i.e., a "did not fish" report) is not required for either earlier week. The weekly VTR reporting requirement brings MSB reporting requirements in line with other Northeast Region fisheries, improves monitoring of directed and incidental catch, and facilitates cross-checking with other data sources.

Pre-Trip Notification in the Mackerel fishery

Amendment 14 requires a 48-hr pre-trip notification for all vessels intending to retain, possess or transfer 20,000 lb (9.07 mt) or more of Atlantic mackerel in order to facilitate observer placement. Currently mackerel vessels have no pre-trip notifications. This measure assists NMFS's scheduling and deployment of observers on directed mackerel trips, with minimal additional burden on the industry, helping ensure that observer coverage target for the mackerel fishery is met. If a vessel operator is required to notify NMFS to request an observer before embarking on a fishing trip, but does not notify NMFS before beginning the fishing trip, that vessel is prohibited from possessing, harvesting, or landing more than 20,000 lb (9.07 mt) of mackerel 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 observers. All waivers or selection notices for observer coverage will be issued by NMFS to the vessel via VMS so the vessel will have an on-board verification of either the observer selection or waiver.

VMS Requirement, Daily Catch Reports and Pre-Landing notifications

Amendment 14 will implement VMS requirements for vessels with limited access mackerel permits and longfin squid/butterfish moratorium permits to improve monitoring of directed and incidental catch. Currently, vessels with these permits are not required to have VMS, to submit catch reports, or to submit pre-landing notifications, although many vessels already possess VMS units due to requirements for other fisheries for which they hold permits.

Amendment 14 requires limited access mackerel and longfin squid/butterfish moratorium permit holders to purchase and maintain a VMS unit. Vessels are required to declare into the fishery for trips targeting mackerel or longfin squid, and are required to transmit location information at least every hour, 24 hours a day, throughout the year (see existing operating requirements at § 648.10(c)(1)(i)). Vessel owners may request a letter of exemption from the NMFS Regional Administrator for permission to power down their VMS units if the vessel is out of the water for more than 72 consecutive hours (see existing Power-down exemption regulations at § 648.10(c)(2)). Vessels that do not already have VMS units installed must confirm that their VMS units were operational by notifying the NMFS Office of Law Enforcement (OLE) (see existing installation notification procedures at § 648.10(e)(1)).

Amendment 14 requires daily VMS catch reporting for all limited access mackerel permits and longfin squid/butterfish moratorium permits. Daily VMS catch reports include: The VTR serial number for the current trip; month and day mackerel and/or longfin squid were caught; and total pounds retained. Daily mackerel and/or longfin squid VMS catch reports must be submitted in

24-hr intervals for each day by 0900 hr of the following day. Reports would be required even if mackerel and/or longfin squid caught that day had not yet been landed.

Amendment 14 also requires that vessels landing more than 20,000 lb (9.07 mt) of mackerel submit a pre-landing notification, in which the vessel reports the time and place of offloading. That notification must be submitted at least 6 hr prior to crossing the VMS demarcation line on their return trip to port, or, for a vessel that has not fished seaward of the VMS demarcation line, at least 6 hr prior to landing.

Alternative Set 2: Additional Dealer Reporting Measures

During the development of Amendment 14, some stakeholders expressed concern that MSB catch is not accounted for accurately and that there needs to be a standardized method to determine catch. In an effort to address those concerns, Amendment 14 proposed that MSB dealers accurately weigh all fish or use volume-to-weight conversions for all transactions with over 2,500 lb (1.13 mt) of longfin squid or 20,000 lb (9.07 mt) of mackerel. If catch is not sorted by species, Amendment 14 proposed that dealers would be required to document for each transaction how they estimate relative species composition.

During the development of Amendment 14, 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, the 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 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 mackerel and longfin squid fisheries, 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 foregoing, 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

mackerel and longfin squid resources, monitors the fisheries, facilitates in-season management, or judge 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 mackerel and longfin squid 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.

Alternative Set 3: Additional At-Sea Observation Optimization Measures

Observer Assistance Requirements

Northeast fisheries regulations (found at 50 CFR part 648) specify requirements for vessels carrying NMFS-approved observers, such as providing observers with food and accommodations equivalent to those 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 14 expands these requirements, such that vessels issued limited access mackerel and longfin squid/butterfish moratorium 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 or net haulback 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. These measures are anticipated to help improve at-sea catch monitoring in the mackerel and longfin squid/butterfish fisheries by enhancing the observer's ability to collect quality data in a safe and efficient manner. Currently many vessels already provide this assistance.

Measures to Address Slippage

Amendment 14 requires limited access mackerel and longfin squid moratorium 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 for sampling, 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. Some stakeholders believe that slippage is a serious problem in the mackerel and longfin squid fisheries because releasing catch before an observer can estimate its species composition undermines accurate catch accounting.

Amendment 14 allows catch to be slipped if: (1) Bringing catch aboard compromises the safety of the vessel or crew; (2) mechanical failure prevents the catch from being brought aboard; or (3)

spiny dogfish prevents the catch from being pumped aboard. If catch is slipped, even for the exempted reasons, 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 any catch brought aboard during the haul; and (3) the time and location of the slipped catch.

Additionally, Amendment 14 proposed establishing slippage caps for the mackerel fishery. Once there have been non-exempted 10 slippage events by limited access mackerel vessels that are carrying an observer, limited access mackerel vessels that subsequently slip catch while 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. The Council recommended these slippage caps to discourage the inappropriate use of the slippage exceptions, and to allow for some slippage, without unduly penalizing the fleet.

Throughout the development of Amendment 14, NMFS expressed concerns with the rationale for, and legality of, the slippage caps for the Atlantic mackerel fleet. The need for, and threshold for triggering, a slippage cap (10 slippage events for the entire fleet) does not have a strong biological or operational basis. From 2006-2010 approximately 26 percent (73 of 277 or 15 per year) of hauls on observed mackerel trips (trips that caught 50 percent or more mackerel or at least 100,000 lb (45.34 mt) of mackerel) had some unobserved catch. Hauls may be unobserved for a variety of reasons—for example, transfer of catch to another vessel without an observer, observers not being on deck to sample a given haul, or hauls released from the net while still in the water. The estimate of 15 unobserved hauls per year would thus be an upper bound on slippage events. Once a slippage cap has been met, vessels that slip catch with an observer aboard for reasons other than safety, mechanical failure, or spiny dogfish in the pump would be required to return to port. Vessels could continue fishing following slippage events 1 thorough 10, but must return to port following the 11th slippage event, regardless of the vessel's role in the first 10 slippage events. The Council's analysis noted that while documented slippage events are relatively infrequent, increases above the estimated 15 unobserved hauls per year could compromise observer data because large quantities of fish can be caught in a single tow. However, the Council's analysis does not provide sufficient rationale for why it is biologically or operationally acceptable to allow the fleet 10 un-exempted slippage events prior to triggering the trip termination requirement.

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, midwater trawl vessels are allowed to continue fishing if they slip catch, 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. 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 appears to be for the proposed slippage caps.

In 2010, the Northeast Fisheries Observer Program (NEFOP) revised the training curriculum for observers deployed in high volume fisheries in the Northeast like the mackerel and Atlantic herring fisheries, to focus on effective sampling in these fisheries. NEFOP also developed a

discard log to collect detailed information on discards in the high-volume fisheries, 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 that the number of slippage events 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 requires 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.

Even though the slippage caps are disapproved, the prohibition on slippage, the released catch affidavit, and the ongoing data collection by NEFOP still allow for improved monitoring in the mackerel fishery, increased information regarding discards, and an incentive to minimize the discarding of unsampled catch.

Alternative Set 4: Portside and Other Sampling/Monitoring Measures

Amendment 14 establishes a mechanism to develop, evaluate, and consider regulatory requirements for a river herring bycatch avoidance strategy in small-mesh pelagic fisheries. The river herring bycatch avoidance strategy would be developed and evaluated by the Council, in cooperation with participants in the mackerel 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.

Amendment 14 requires that, within 6 months of completion of the existing SFC/MA DMF/SMAST river herring bycatch avoidance project, the Council would review and evaluate the results from the river herring bycatch avoidance project, and consider a framework adjustment to the MSB FMP to establish river herring bycatch avoidance measures. Measures that may be considered as part of the framework adjustment include: (1) Mechanisms to track herring fleet activity, report bycatch events, and notify the herring fleet of encounters with river

herring; (2) the utility of test tows to determine the extent of river herring bycatch in a particular area; (3) the threshold for river herring bycatch that would trigger the need for vessels to be alerted and move out of a given area; and (4) the distance and/or time that vessels would be required to move from an area.

Alternative Set 5: At-Sea Observer Coverage Requirements

Currently, observer coverage in the MSB fisheries is determined by the Northeast Fisheries Science Center, based on the SBRM, after consultations with the Council, and funded by NMFS. In Amendment 14, the Council recommended increases in the observer coverage in the mackerel fishery, specifically 100-percent observer coverage on all limited access mackerel vessels using midwater trawl (i.e., Tiers 1, 2 and 3) and Tier 1 mackerel vessels using small-mesh bottom trawl, 50-percent coverage on Tier 2 mackerel vessels using small-mesh bottom trawl, and 25-percent on Tier 3 mackerel vessels using small-mesh bottom trawl. Many stakeholders believe that this measure is necessary to accurately determine the extent of incidental catch of river herring and shad in the mackerel fishery. The Council recommended this measure to gather more information on the mackerel fishery so that it may better evaluate and, if necessary, address issues involving catch and discarding. The increased observer coverage recommendations are coupled with a target maximum industry contribution of $325 per day. The at-sea costs associated with an observer in the mackerel fishery are higher than $325 per day and, currently, there is no mechanism to allow cost-sharing of at-sea costs between NMFS and the industry.

Throughout the development of Amendment 14, NMFS advised the Council that Amendment 14 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 14 does not identify a funding source to cover all of the increased costs of observer coverage, the proposed increase in coverage levels many not be 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 mackerel fishery.

NMFS is working with both the Mid-Atlantic and New England Fishery Management Councils to address the funding challenges identified in Amendments 14 and other recent actions concerning observer coverage in the Atlantic herring and Northeast multispecies fisheries. NMFS recently agreed to take the lead on an omnibus action to better define the costs of observer coverage, create requirements for any fisheries that desire to increase observer coverage using industry funding, and create a regional prioritization process to allocate available Federal funding to achieve regional coverage goals. In addition, NMFS is working to identify a mechanism to offset some of industry's costs, possibly through grants, when funding is available. NFMS will present both Councils with an initial range of alternatives at their January and February 2014 meetings.

Other measures in Amendment 14 would help improve monitoring in the mackerel fishery, regardless of whether the increased observer coverage measure is approved at this time. 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, and observer sample station and reasonable

assistance requirements to improve an observer's ability to collect quality data in a safe and efficient manner.

The same measure that would require increased observer coverage, coupled with a maximum $325 contribution by the industry, would also require that: (1) The increased observer coverage requirement would be re-evaluated by the Council 2 years after implementation; (2) the increased observer coverage requirement would be waived if no observers were available; and (3) observer service provider requirements for the Atlantic sea scallop fishery would apply to observer service providers for the mackerel fishery. Because these additional measures appear inseparable from the increased 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.

Alternative Set 6: Mortality Caps and Alternative Set 8: Hotspot Restrictions

River herring and shad are managed by the Atlantic States Marine Fisheries Commission (ASMFC) and individual states. According to the most recent ASMFC stock assessments for river herring (May 2012) and shad (August 2007), river herring and shad 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 recently completed a comprehensive review of the status of river herring (but not shad) in response to a petition submitted by the Natural Resources Defense Council requesting that we list alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) as threatened under the Endangered Species Act throughout all or a significant portion of their range or as specific distinct population segments identified in the petition. Based on the best scientific and commercial information available, we determined that listing alewife as threatened or endangered under the ESA is not warranted at this time (August 12, 2013; 78 FR 48944).

Amendment 14 establishes a mortality cap on river herring and shad in the mackerel fishery, where the mackerel fishery would close once it has been determined to cause a certain amount of river herring and/or shad mortality. Based on the results of the ASMFC's assessments for river herring and shad, data do not appear to be robust enough to determine a biologically based catch cap for these species, and/or the potential effects on these populations if a catch cap is implemented on a coast-wide scale, therefore a cap would have to be based on historical estimates of river herring and shad catch in the mackerel fishery. Nevertheless, the Council believes that capping the allowed level of river herring and shad catch in the mackerel fishery would provide a strong incentive for the industry to avoid river herring and shad, and would help to minimize encounters with these species.

The likelihood of a mackerel closure related to the river herring and shad cap would depend on the value the Council proposes for the cap for a given year, the availability of mackerel for that year, and the realized incidental catch of river herring and shad for that year. The analysis

presented in Amendment 14 estimated that total ocean fishing mortality (all gear types and fisheries) ranged from 244 to 672 mt for both river herring species (2006-2010), and 47 to 70 mt for both shad species (2007-2010). To qualitatively evaluate the biological and economic impacts of a river herring and/or shad cap, Amendment 14 presented an analysis in which the cap was set equal to 35 percent of total ocean fishing mortality for river herring, and 12 percent of total ocean fishing mortality for shad. These percentages correspond to the estimated amount of mid-water trawl mortality for these species in Quarter 1 of the fishing year, which largely encompasses mackerel fishing activity. The proposed mortality cap on river herring and shad would use a similar method to that used for the butterfish mortality cap in the longfin squid fishery, where the ratio of river herring and shad caught to total catch on observed hauls would be applied to all catch. The analysis in Amendment 14 applies this methodology to mimic low, medium, and high rates of river herring and shad encounters on mackerel trips. If the mackerel fishery had been able to harvest the entire 115,000-mt mackerel quota in any year from 2006 to 2010, a river herring cap equal to 35 percent of total river herring ocean catch would have resulted in closures of the mackerel fishery in 3 of the years if there were low river herring encounter rates, and all of the years if there were medium and high river herring encounter rates. Similarly, a shad cap equal to 12 percent of the total shad ocean catch would not have caused a closure of the mackerel fishery in any of the years if there were low shad encounter rates, but would have resulted in a closure in all of the years with medium and high shad encounter rates. The analysis concluded that, because river herring and shad catch vary substantially from year to year, the realized combination of these factors may cause an early closure of the mackerel fishery in some years, and in other years may not result in a closure at all.

While the concept of the cap and general methodology are analyzed in Amendment 14, the Council's proposal deferred the establishment of the actual cap amount and other logistical details of the cap (e.g., the closure threshold and post-closure possession limit) to the MSB specifications process for the 2014 fishing year. The process for 2014 MSB specifications began in May 2013 with a MSB Monitoring Committee meeting to develop technical recommendations on the cap level and any necessary management measures. At its June 2013 meeting, the Council selected a combined catch cap for river herring and shad of 236 mt, a closure threshold of 95 percent, and a post-closure incidental trip limit of 20,000 lb (9.07 mt). The Council is finalizing its analysis of these measures and has submitted its final recommendation to NMFS as part of the 2014 MSB specifications package. Secretarial approval of both Amendment 14 and the 2014 MSB specifications are necessary for implementation of the river herring and shad caps in the mackerel fishery, which is targeted for the start of the 2014 fishing year (January 1, 2014).

One of the primary purposes of Amendment 14 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. Amendment 14 considered other measures to address river herring bycatch, 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 14 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.

In order to streamline the regulatory process necessary to adjust the river herring and shad mortality caps, or enact time area management for river herring and shad, should scientific information to support such management measures become available, the Council proposed that Amendment 14 would add river herring and shad catch caps and time/area closures to the list of measures that can be addressed via framework adjustment.

As required, NMFS evaluated Amendment 14 relative to the National Standards described in section 301 of the MSA, and found the action, with the exception of the disapproved measures, to be consistent with these standards. A summary of the rationale for the determination of compliance is in Section 9 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 MSB fisheries 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 14.

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 14 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 expand vessel reporting and 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, 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 7 of the FEIS for a complete analysis of the biological impacts of the proposed measures and other non-selected options.

1. Impacts on the MSB Resource

The MSB fisheries are managed through hard quotas (longfin and Illex squid), and annual catch limits (ACLs) (mackerel and butterfish) that are designed to prevent overfishing. Due to the ongoing management of the MSB fisheries through hard quotas/ACLs, selection of the proposed

measures versus other non-selected options considered in Amendment 14 are not likely to directly impact the health of the MSB resource in the short-term. However, some of the indirect, long-term benefits likely to result from the proposed measures under consideration in Amendment 14 would not be realized if no action is taken.

The long-term benefits to the MSB 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 Atlantic mackerel and longfin squid stock assessments. While the proposed measures to adjust vessel and dealer reporting measures are not likely to directly impact the health of the MSB resource in the short-term, there may be some indirect, long-term benefits to the MSB species 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 MSB resource.

2. Impacts on Non-Target Species and Other Fisheries

In the Amendment 14 FEIS, non-target species refers to species other than Atlantic mackerel, longfin squid, *Illex* squid, and butterfish that are caught and landed with these species, and other fisheries refers to those fisheries directly affected by or related to the operation of the MSB fisheries, such as Atlantic herring, and river herring (in state waters). When river herring and shad are encountered in the mackerel and longfin squid fisheries, they are either discarded at sea (bycatch) or, because they closely resemble Atlantic herring, they are retained and sold as part of the herring catch (incidental catch). Because of these interactions, for the purposes of Amendment 14, 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 and shad in the mackerel and longfin squid fisheries is limited and highly variable. The proposed measures to establish increased monitoring areas for river herring and shad in Alternative Sets 7 and 8 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 and shad encounters in the mackerel and longfin squid fisheries. The Council did not adopt the options to establish closed areas proposed in Alternative Sets 7 and 8 and prohibit fishing in those areas. While closing to fishing may reduce the bycatch of river herring and shad 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 mackerel and longfin squid catch and industry income. A better understanding of the nature of river herring and shad bycatch in the mackerel and longfin squid fisheries will assist with weighing these factors in order to minimize river herring and shad bycatch to the extent practicable. Additionally, the proposed measure to establish a river herring and shad catch cap in the

mackerel fishery is expected to complement the existing, voluntary river herring bycatch avoidance program and may be an effective tool to minimize river herring and shad catch in the mackerel fishery.

3. Impacts on the Physical Environment and EFH

Because Amendment 14 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 MSB fishing effort. The non-selected options to establish river herring and shad closed areas in Alternative Sets 7 and 8 may have reduced the amount of fishing effort in those areas. However, gear impacts of the MSB fisheries 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 14 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 MSB 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 non-selected options to establish river herring and shad closed areas in Alternative Sets 7 and 8 may have reduced the amount of fishing effort in those areas. However, interactions between protected species and the MSB fisheries 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 14 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 14 relative to the continuation of no action alternatives or non-selected alternatives considered in Amendment 14. Therefore, specific management measures to mitigate environmental impacts are not necessary.

Response to Comments

NMFS published the NOA for the Amendment 14 FEIS was on August 16, 2013, with a comment period ending September 16, 2013. NMFS received one comment letter from the Environmental Protection Agency (EPA) during the FEIS NOA comment period.

In addition, NMFS published an NOA for Amendment 14 and a proposed rule under the MSA on August 12, 2013, and August 29, 2013, respectively, with a comment period ending October 11, 2013, for both. NMFS received 5 comment letters on Amendment 14 from environmental advocacy groups prior to the end of the Amendment 14 comment periods on October 11, 2013. While not submitted during the FEIS NOA comment period ending on September 16, 2013, these 5 comment letters addressed the FEIS, and the comments are therefore addressed below as part of this Record of Decision. In making its final decision to partially approve Amendment 14, NMFS has taken into account all comments on Amendment 14, as reflected in the documentation accompanying this Record of Decision.

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 14.

Response: NMFS concurs.

Comment 2: NMFS received numerous comments from environmental advocacy groups that the analysis in the FEIS provides a reasonable basis for capping slippage events at 10 slippage events.

Response: The FEIS notes that, from 2006-2010 approximately 26 percent (73 of 277 or 15 per year) of hauls on observed mackerel trips (trips that caught 50 percent or more mackerel or at least 100,000 lb (45.34 mt) of mackerel) had some unobserved catch. Hauls may be unobserved for a variety of reasons—for example, transfer of catch to another vessel without an observer, observers not being on deck to sample a given haul, or hauls released from the net while still in the water. The FEIS discusses that, while documented slippage events are relatively infrequent, increases above the estimated 15 unobserved hauls per year could compromise observer data because "high-volume fisheries…can catch large quantities of fish in a single tow." NMFS agrees that unobserved hauls can compromise observer data, and that limiting the total number of slippage events to 10 does reduce slippage events from the recent average of 15 unobserved hauls on mackerel trips. However, the FEIS does not provide sufficient rationale for why it is biologically or operationally acceptable to allow the fleet 10 un-exempted slippage events prior to triggering the trip termination requirement, as opposed to any other number. For example, if the 10 slippage events allowed before the cap contributed significantly to river herring and shad mortality, there is no biological justification for why the 10 vessels that released hauls prior to the cap being attained were allowed to do so without penalty, while all vessels that released subsequent hauls would be forced to return to port. For this reason, NMFS believes the FEIS does not provide a strong operational basis for a slippage cap value.

Summary

After review of the proposed measures, the associated analyses, and public comment, NMFS is partially approving Amendment 14 to the MSB FMP, as described above. This action is intended to improve the catch monitoring program for the MSB fisheries 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 14. Responses to all comments on the Amendment 14 DEIS are available in Appendices 8 and 9 of the FEIS, with comments received on the Amendment 14 FEIS, and responses, listed in this ROD. Further, the accompanying documentation supporting NMFS's decision includes a summary of all comments on the Amendment 14 MSA NOA and proposed rule.

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

11/7/13
Date