

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Amendment 4 to the Herring Fishery Management Plan (FMP)

DRAFT Discussion Document

This document summarizes the work of the New England Fishery Management Council’s Herring Committee, Advisory Panel (AP), and Plan Development Team (PDT) to date regarding the development of specific management measures and the range of alternatives that may be analyzed in the Draft EIS for Amendment 4 to the Herring FMP. Relevant background and supporting information/analyses provided by the Herring PDT are also included in this document.

AMENDMENT 4 DISCUSSION DOCUMENT

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1.0 INTRODUCTION/BACKGROUND

The New England Fishery Management Council (Council) is developing an amendment to the Fishery Management Plan (FMP) for Atlantic herring (*Clupea harengus*) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), recently reauthorized as part of the Magnuson-Stevens Reauthorization Act of 2006 (MSRA). In accordance with the National Environmental Policy Act (NEPA), the Council also intends to prepare an Environmental Impact Statement (EIS) that will analyze the impacts of this amendment on both the physical and human environment.

1.1 PURPOSE AND NEED

The original Herring FMP and Amendment 1 represent important milestones in the Council's efforts to maintain a sustainably-managed Atlantic herring fishery throughout New England. Recently, concerns about the fishery have led the Council to determine that additional action is needed to further address issues related to the health of the herring resource throughout its range, how the resource is harvested, how catch/bycatch are accounted for, and the important role of herring as a forage fish in the Northeast region. These concerns are reflected in the unprecedented level of interest in managing this fishery by New England's commercial and recreational fishermen, eco-tourism and shoreside businesses, and the general public.

The MSRA reflects an update of the original Magnuson–Stevens Act (MSA) and retains key provisions of the Sustainable Fisheries Act (1996) while making adjustments to the legislation designed to improve national compliance with the Act. One specific focus of this amendment will be the MSRA requirements that NMFS and the Councils establish Annual Catch Limits (ACLs) such that overfishing does not occur in the fishery, and Accountability Measures (AMs) for the overages of harvest levels. The MSRA directs the Councils to follow the recommendations of its Scientific and Statistical Committee (SSC) in setting catch limits for every federally-managed fishery that is not subject to overfishing by the year 2011.

1.2 GOALS AND OBJECTIVES

1.2.1 Goals and Objectives – Herring Fishery Management Program (Amendment 1)

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

GOAL (AMENDMENT 1): Manage the Atlantic herring fishery at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act.

OBJECTIVES (AMENDMENT 1):

1. Harvest the Atlantic herring resource consistent with the definition of overfishing contained in the Herring FMP and prevent overfishing.
2. Prevent the overfishing of discrete spawning components of Atlantic herring.
3. Avoid patterns of fishing mortality by age which adversely affect the age structure of the stock.
4. Provide for the orderly development of the herring fishery in inshore and offshore areas, taking into account the viability of current and historical participants in the fishery.
5. Provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery while minimizing waste from discards in the fishery. Optimum yield is the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, taking into account the protection of marine ecosystems, including maintenance of a biomass that supports the ocean ecosystem, predator consumption of herring, and biologically sustainable human harvest. This includes recognition of the importance of Atlantic herring as one of many forage species of fish, marine mammals, and birds in the Northeast Region.
6. Prevent excess capacity in the harvesting sector.
7. Minimize, to the extent practicable, the race to fish for Atlantic herring in all management areas.
8. Provide, to the extent practicable, controlled opportunities for fishermen and vessels in other Mid-Atlantic and New England fisheries.
9. Promote and support research, including cooperative research, to improve the collection of information in order to better understand herring population dynamics, biology and ecology, and to improve assessment procedures.
10. Promote compatible U.S. and Canadian management of the shared stocks of herring.
11. Continue to implement management measures in close coordination with other Federal and State FMPs and the ASMFC management plan for Atlantic herring, and promote real-time management of the fishery.

1.2.2 Goals and Objectives of Amendment 4 (Proposed)

The goals and objectives of Amendment 4, provided below, were recommended by the Council's Herring Committee at its March 25, 2008 meeting and approved by the Council as part of this Scoping Document. They are specific to Amendment 4; they acknowledge the primary issues to address and form the basis of the management alternatives that will be developed for consideration and analysis in the EIS and public hearing document for Amendment 4.

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

GOAL (AMENDMENT 4)

To develop an amendment to the Herring FMP to improve catch monitoring and ensure compliance with the Magnuson-Stevens Reauthorization Act of 2006

OBJECTIVES (AMENDMENT 4)

1. To implement measures to improve the long-term monitoring of catch (landings and bycatch) in the herring fishery;
2. To implement Annual Catch Limits (ACLs) and Accountability Measures (AMs) consistent with the Magnuson-Stevens Reauthorization Act (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 Limited Access Privilege Program (LAPP) for the Atlantic herring fishery; and~~
- 5. *To implement management measures to address bycatch in the Atlantic herring fishery(?);***
6. 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.

Discussion

The objectives specific to Amendment 4 may change as the management alternatives are developed and the Council narrows the scope of the amendment. Ultimately, the Council will approve conservation and management measures to address the relevant management issues and meet the goals/objectives that it determines are appropriate to address for Amendment 4, also considering the goals/objectives of the herring management program that were established in Amendment 1.

1.3 AMENDMENT 4 – DEVELOPMENT OF ALTERNATIVES AND ANTICIPATED TIMELINE (NOT YET UPDATED)

The Council and its Atlantic Herring Oversight Committee have held preliminary public discussions on the issues to be addressed in Amendment 4 to the Herring FMP. After gathering information during the scoping period (through June 30, 2008), the Herring Committee began work on developing a range of alternatives to be considered and analyzed in a Draft Environmental Impact Statement (DEIS) and public hearing document for Amendment 4. Committee meetings were held during the scoping period so that background information could be provided by the PDT and scoping comments could be submitted by the public and the Herring Advisory Panel (AP). The Committee met jointly with the Herring AP during July 2008 and met independently during September/October 2008 to continue work on the development of management alternatives and develop recommendations for the Council to review at its meeting in October 2008.

At the October 7-9, 2008 meeting, the Council reviewed work on the management alternatives and considered the Herring Committee's recommendations regarding specific management measures for further development in Amendment 4. Following the October Council meeting, the Committee continued to flesh out the details of the management alternatives that will be forwarded to the Council for approval and incorporation into a Draft EIS (DEIS) for Amendment

4. At its November 2008 meeting, the Council agreed to also develop measures during 2009 that establish criteria for midwater trawl access to the groundfish closed areas; these measures may be included in Amendment 4 or incorporated into another management action for herring, depending on issues related to timing and workloads.

In late 2008, the Council also solicited suggestions/proposals from stakeholders regarding the specific elements of a catch monitoring program for the herring fishery, to be developed in Amendment 4. Stakeholder proposals were reviewed by the Herring Committee at the December 2008 meeting, and some elements of the proposals will be incorporated into the Committee's alternatives for further consideration in the Amendment 4 DEIS.

The Herring Committee will continue to work with the Advisory Panel and PDT on the development of management alternatives through the early part of 2009, and the Council is scheduled to approve the range of alternatives for the Amendment 4 DEIS in June 2009. Once the DEIS is prepared and approved, and once the Council identifies its preferred alternative(s), the Council will distribute the DEIS as well as an abbreviated public hearing document for public review. A 45-day public hearing and comment period will allow interested stakeholders to comment on any aspects of the Amendment 4 DEIS, including the alternatives under consideration and the analyses of the impacts prepared by the Council's Herring PDT.

Following a review of all public comments and input from the Herring Advisory Panel and Herring Committee, the Council will select the final management measures for submission to the Secretary of Commerce as Amendment 4 to the Herring FMP. The Council is scheduled to select the final measures for Amendment 4 in early 2010. If no delays are encountered during the development process, Amendment 4 is scheduled to become effective no later than the start of the 2011 fishing year (January 1, 2011).

Currently, the following "milestones" in the development of Amendment 4 are anticipated for (always subject to change):

- **June 2009** – Council approves Amendment 4 alternatives for analysis in Draft EIS (more likely to be April);
- **September/November 2009** – Council approves Draft Amendment 4/Draft EIS and public hearing document, selects preferred alternatives; Council also approves specifications for 2010 fishing year;
- **January/February 2010** – Herring Amendment 4 Public Hearings
- **April 2010** – Council reviews public comment, AP recommendations, Committee recommendations, and selects final management measures for Amendment 4;
- **May 2010** – Council staff submits Amendment 4;
- **January 1, 2011** – Amendment 4 implementation deadline; implementation of 2011-2013 herring fishery specifications.

2.0 MEASURES/ALTERNATIVES TO ESTABLISH ANNUAL CATCH LIMITS (ACLS) AND ACCOUNTABILITY MEASURES (AMS)

2.1 INTRODUCTION/BACKGROUND INFORMATION

The M-S Act was reauthorized in 2007 (Magnuson-Stevens Reauthorization Act, MSRA) and one new requirement is to establish annual catch limits (ACLs) and accountability measures (AMs) in order to end and/or prevent overfishing in all FMPs.

Section 302 (h)(6) of the MSRA states: *(Each Council shall) develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its Scientific and Statistical Committee or the peer review process established.*

Section 303 (a)(15) of the MSRA states: *(Any FMP shall) 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.*

NMFS has provided input on what these new requirements may entail through Agency guidance on how Councils can comply with National Standard 1 and the new MSRA requirements. The Proposed Rule for the revised National Standard guidelines was published by NMFS on June 9, 2008, and the comment period on the Proposed Rule extended through September 22, 2008. Following a review of public comments, NMFS published a Final Rule with guidelines on complying with the MSRA and the National Standards, including the implementation of ACLs and AMs to meet National Standard 1 (preventing overfishing) on January 16, 2009.

In general, the guidelines include details about how FMPs must prevent overfishing while achieving optimum yield (OY) on a continuing basis. There are general definitions of several new and existing terms. The Final Rule also describes what is required in an FMP related to National Standard 1 – prevent overfishing. The Council’s Scientific and Statistical Committee (SSC) is required to recommend a level of acceptable biological catch, from which the Council is required to establish annual catch limits for the fishery. There is guidance on what is a “fishery” and which stocks are and are not required to have ACLs and AMs. There are also detailed descriptions of exceptions to these requirements, guidance for international fisheries, and various requirements for describing data collection and estimation methods.

Integration of the MSRA’s new ACL/AM requirements across all federally-managed fisheries in the Region will present new challenges to fisheries managers and regulators. The MSRA deadline for implementing regulations consistent with the new law is 2010 for overfished fisheries and 2011 for fisheries not subject to overfishing. Efforts must be coordinated to address overlapping stocks and fisheries and to ensure that adequate monitoring provisions are developed across the Northeast Region as a whole. Further guidance from NMFS regarding the integration of the new provisions and implementation/administration of ACLs/AMs across all fisheries in the Northeast Region may be helpful to ensure the long-term success of this management approach.

The Atlantic Herring FMP is required to be in compliance with the new provisions of the MSRA by 2011 because the Atlantic herring fishery is not subject to overfishing at this time. The Atlantic herring fishery has been managed using hard TACs since the 2000 fishing year. The TACs are developed through the fishery specification process and are based on an *Allowable Biological Catch* (ABC) that is based on MSY and has been reduced to OY based on biological, economic, ecological, and other considerations. The Herring FMP has already laid the foundation for complying with the ACL and AM requirements of the MSRA, although additional accountability measures are likely required. The measures considered in this amendment are modifications to the fishery specification process (the process that will be used to establish *annual catch limits*), measures to ensure the effectiveness of the TACs, and/or measures to address TAC overages (*accountability measures*). The Council may consider establishing additional accountability measures in this amendment to address TAC overages in the future, if they occur. This issue is discussed in more detail, and options are proposed for consideration in the following subsections.

2.1.1 Introduction and Background – Annual Catch Limits (ACLs)

According to guidance from NMFS, FMPs should set ACLs based on recommendations from the Council’s Scientific and Statistical Committee (SSC) for all managed fisheries. The “overfishing limit” (OFL) identified in the MSRA essentially corresponds to a maximum sustainable yield (MSY) value for the fishery. NMFS recommends that acceptable biological catch (ABC) and an annual catch limit (ACL) be established as well. The ABC should be set lower than the OFL to account for scientific uncertainty as necessary:

$$\text{OFL} \geq \text{ABC} \geq \text{ACL}$$

NMFS recommends that an ABC control rule be established for each stock when possible. The ABC control rule should be a specified approach to setting ABC for a stock as a function of the scientific uncertainty in the estimate of OFL. The Final Guidelines published by NMFS do not specify that an Annual Catch Threshold (ACT) or ACT control rule be established (unlike the Proposed Guidelines). However, NMFS encourages the use of ACTs in the management system to ensure that ACLs are not exceeded. The Final Rule retains the concept of an ACT and an ACT control rule as an option for managing fisheries and suggests that “for fisheries without in-season management control to prevent the ACL from being exceeded, AMs should utilize ACTs that are set below ACLs so that catches do not exceed ACLs” (50 CFR 600.310(g)(2)). If ACTs are utilized, they should account for management uncertainty associated with controlling the actual catch at or below the ACL.

During ACL-setting process, the Council’s SSC will provide guidance on the ABC control rule as part of its recommendations for ABC. In general, ACLs and AMs should be established such that the risk of exceeding ABC is minimized, incorporating ACTs if necessary. The need for ACTs should be evaluated in the context of management uncertainty and accountability measures. NMFS suggests that two sources of management uncertainty be accounted for when establishing AMs and considering ACTs/ACT control rules: (1) uncertainty in the ability of the management program to constrain catch at or below the ACL; and (2) uncertainty in quantifying true catch amounts (estimation errors, reporting lag times, etc.).

There are several steps that must be specified to set ACLs. In some cases, the MSRA requires certain steps to be performed by specific entities (generally either the Council or the SSC). These requirements will be discussed in more detail later in this section:

- Appropriate fishing mortality references should be identified.
- Current stock size should be estimated.
- Available catch should be estimated for the appropriate fishing mortality reference at current, or projected, stock size, taking into account biological and management uncertainty and risk.
- Available catch should be allocated to different components of the fishery, or to other fisheries as appropriate.
- Council decisions should be reviewed, discussed, and published.

The Herring Plan Development Team (PDT) has generally discussed issues associated with setting ACLs and AMs for the herring fishery and bringing the Herring FMP into compliance with the MSRA requirements. For the most part, the Herring PDT agrees that the current fishery specification process for Atlantic herring provides a reasonable framework for setting ACLs and ensuring compliance with the new requirements in the MSRA. Management measures proposed in this amendment therefore focus on modifications to the fishery specification process and address the need to establish accountability measures in the fishery as appropriate.

The current overfishing limit for the Atlantic herring fishery is specified as *allowable biological catch*, which is based on the most recent scientifically-accepted estimate of MSY for the stock complex. Note that this specification of ABC, the *allowable biological catch*, is different from the MSRA's requirement to specify ABC, the *acceptable biological catch*. The MSRA's interpretation of ABC includes consideration of biological uncertainty (stock structure, stock mixing, and other stock assessment issues, for example), and recommendations for ABC should come from the Council's SSC.

Several modifications to the specification process are required to bring the Atlantic Herring FMP into compliance with the MSRA, most notably the introduction of new terminology, changes to the ABC specification, the addition of the Council's SSC to the process for setting ABC, and separate consideration of scientific and management uncertainty during the ACL-setting process. Based on the new MSRA requirements, once scientific uncertainty is accounted for and the OFL for Atlantic herring (MSY if the stock is not subject to overfishing) is adjusted accordingly to a level corresponding to *acceptable biological catch* (ABC) based on recommendations from the Council's SSC, an ACL for the stock complex may be established, and the ACL can be divided into TACs or sub-ACLs, which can be specified for each management area. The sub-ACLs (TACs for the management areas) should be set such that the risk of overfishing a stock component is minimized to the extent possible. This process is described in more detail in the following sections.

2.1.2 Establishing ACLs for the Atlantic Herring Resource and U.S. Fishery – Important Considerations

Amendment 1 to the Atlantic Herring FMP authorized the Herring PDT, in consultation with the Herring Committee, Advisory Panel, and other interested parties, to utilize the most appropriate analytical approach for determining the distribution of area-specific TACs during the fishery specification process, provided the PDT justifies its approach. Depending on stock/fishery conditions as well as the quality and resolution of available information, the most appropriate approach for calculating the distribution of area-specific TACs may be the approach currently outlined in the Herring FMP, a “catch scenario analysis” approach, an approach that utilizes assessment information specific to individual stock components (currently not available, but may be in the future), or another analytical approach. These provisions for the fishery specification process grant the Herring PDT flexibility to utilize all available information to determine the most appropriate analytical approach as part of the specification process. These provisions also will form the basis of the ACL-setting process in this FMP. The herring fishery specification process was changed to a three-year process in Amendment 1 to the Herring FMP, and it is assumed that ACL-setting will follow the same general approach.

The specification of optimum yield (OY) for the Atlantic herring fishery is still required by the MSRA and will remain an important part of the process. OY is derived from maximum sustainable yield (MSY) and relates to the geographic distribution of the selected total allowable catches (TACs, which will become ACLs), the relative risk of overfishing individual stock components, and the extent to which development of the offshore fishery should be encouraged, among other factors. The Herring FMP (as well as the MSRA) states that the establishment of OY will include consideration of relevant economic, social, or ecological factors and that for this reason, OY may be less than ABC – Canadian catch. The Council may determine that a buffer between ABC and OY is appropriate because of scientific uncertainty (ex., the status of the inshore component of the resource), the importance of recruitment and ensuring strong year classes in the future, the importance of herring as a forage species, and/or the potential impact of any increase in the Canadian fisheries for herring, particularly the NB weir fishery, which tends to catch more juvenile fish from the inshore component of the resource. The fishery specification process will include discussion of these factors, as appropriate, when the PDT develops its recommendations for both ABC and ACLs for the SSC to consider.

2.1.2.1 Addressing Scientific Uncertainty and Stock Assessment Issues when Setting ABC and ACLs

Atlantic herring (*Clupea harengus*) range geographically from Labrador to Cape Hatteras, with major spawning areas restricted to the northern regions of resource distribution. However, clear understanding of herring stock structure has varied over time, and the delineation of stock component boundaries has been challenging due to the degree of inter-seasonal mixing between components. The movement and seasonal distribution of the stock components has also had a significant impact on the assessment of stock status, on how fishing effort has been assigned, on the development of a catch-at-age matrix and on the management of several herring fisheries.

Assumptions regarding the seasonal movement, intermixing, and spawning of the individual stock components used in the assessment and management of the Atlantic herring stock complex have changed over the years. As a result, assessment of the Atlantic herring resource remains complex-wide at this time. Until such time when separate assessments of the stock components become available, biological reference points like MSY and ABC are established for the stock complex as a whole. Management reference points like ACLs, however, can be established based on the need to protect individual stock components, and with adequate consideration of fishing patterns and other factors affecting the fisheries. Uncertainty regarding stock structure and stock component mixing is an important issue that must be factored into decisions regarding the specification of scientific and management reference points under the new provisions of the MSRA.

Although the Atlantic herring stock is assessed as one meta-complex, most scientists recognize two sub-components; the inshore Gulf of Maine (GOM) and offshore Georges Bank/Nantucket Shoals component. Both of these components are separated during spawning, but mix while on feeding (Area 1A and 1B) and over-wintering grounds (Area 2). Evidence of mixing either in Area 3 or during spawning season in any location other than 1B (August- November) is lacking and herring caught in Area 3 are assumed to come entirely from the offshore component of the resource. The herring management area boundaries were modified in Amendment 1 to better reflect the distribution of the offshore component in Area 3. Mixing of both stock components occurs in other management areas. Uncertainty associated with the mixing of herring stock components is a critical scientific issue that must be addressed to the extent possible when establishing ACLs to ensure that overfishing does not occur on an individual stock component. Without a separate stock assessment for the inshore stock component, the appropriate target and threshold fishing mortality rates remain unknown. In 2004, the Herring PDT identified three primary sources of uncertainty associated with mixing ratios:

1. the mix of catch in the New Brunswick weir fishery (assumed to be 100% from the inshore component);
2. the mix of catch from Area 1A in the summer; and
3. the seasonal mix of catch from Area 2, particularly in the winter fishery.

Scientific uncertainty is currently addressed through the herring fishery specifications by setting optimum yield (OY) for the herring fishery at a level lower than MSY, and the total allowable catches (TACs) are set for each management area such that the sum of the management area TACs equal available U.S. OY for the fishery. The Herring PDT also incorporates uncertainty when assessing the impacts of the TACs and developing recommendations regarding how to divide the TACs by management area while minimizing the risk of overfishing any individual stock component.

Uncertainty associated with the mixing of herring stock components has been addressed in previous years' specifications through a "catch scenario" analysis conducted by the Herring PDT, primarily by considering removals of the inshore component across the entire range of mixing scenarios instead of relying on a few specific mixing rate combinations. The catch scenario analysis evaluates relative risk associated with the proposed action and other TAC alternatives by estimating removals from the inshore component across all possible mixing rate

combinations, which can then be compared to “historical” removals (1995-2005 in the last round of specifications) under the same mixing ratios. More risk is associated with TAC alternatives that project higher removals from the inshore component than the historical average.

As an example, during the most recent round of fishery specifications (2007-2009), the Council established a buffer of 29,000 mt between ABC (allowable biological catch) and OY for the following reasons:

- At the 2006 TRAC Assessment Meeting, scientists identified a significant **retrospective pattern** in the model utilized to estimate Atlantic herring biomass and fishing mortality. The retrospective pattern overestimates SSB (averaging + 14.5%/year, and ranging between 1-24%) and underestimates fishing mortality; this is a concern that should be considered in the context of allowing the herring fishery to expand significantly and/or rapidly above current levels. It is clear that current levels of removals from the stock complex (around 100,000 mt for the last 15 years) are sustainable and should not cause concern relative to the health of the resource. The retrospective pattern in the assessment model suggests that the Council may want to be cautious about allowing removals to increase rapidly to levels significantly above what has been observed in the fishery over the last 15 years. While a buffer still provides opportunities to expand the fishery in the appropriate areas, allowing removals from the fishery to increase all the way to ABC may be detrimental to the stock complex over the long-term, given the retrospective pattern.
- **Recruitment** for Atlantic herring is highly dependent on favorable environmental conditions. While recruitment in 1994, 1998, and 2001 appears to have been stronger than average, it is noted that other years, particularly the 1999 and 2003 year classes, have produced year classes weaker than expected. Recent strong year classes should not be considered the “norm” for this stock. Variability around the stock-recruitment relationship is common for many clupeids (other examples include menhaden and river herring). A buffer between ABC and OY may help to ensure that adequate SSB is available to produce strong and healthy recruitment in fluctuating and unpredictable environmental conditions.
- The **importance of herring as a forage species** for other Northeast region fish, mammals, and birds is another reason that a buffer between ABC and OY may be appropriate at this time. One of the objectives of Amendment 1 to the Herring FMP is to “provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery...this includes recognition of the importance of Atlantic herring as one of many forage species of fish, marine mammals, and birds in the Northeast Region.” Consequently, OY should be specified such that the Council remains confident in the fishery’s ability to fully utilize the yield while continuing to address the needs of the ecosystem in which herring is an important component.

2.1.2.2 The Importance of Herring as a Forage Species in the Northeast Region Ecosystem

Setting ABC and dividing it into ACLs for the herring fishery management areas 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 throughout the region to the extent possible. One of the objectives of this amendment (Section XXX) is:

In the context of Objectives 1 – 4, 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.

The ACL and AM provisions established in this amendment, therefore, should account for the importance of herring as a forage species and the role of herring in the Northwest Atlantic ecosystem.

NMFS Guidelines for National Standard 1 suggest that when specifying OY and determining the greatest benefit to the Nation, one of the values that should be weighed and given serious attention is the need to maintain adequate forage for all components of the ecosystem. The ecological factors that may be incorporated into decisions regarding the specification of OY include impacts on ecosystem component species, forage fish stocks, other fisheries, predator-prey or competitive interactions, marine mammals, threatened or endangered species, and birds. Species interactions that have not been explicitly taken into account when estimating MSY (through a stock assessment) should be considered as relevant factors for setting OY below MSY. In addition, consideration should be given to managing forage stocks for higher biomass than B_{MSY} to enhance and protect the marine ecosystem.

All of the above considerations will be considered by the Herring PDT and the Council when specifying Optimum Yield and determining the appropriate level of catch for the fishery as part of the specifications process. Stock assessment work should also incorporate new information about the role of herring in the ecosystem and the impact of predation on total herring mortality and stock biomass. Consideration of predatory impacts on the herring resource were incorporated into the last stock assessment and reviewed by the Herring PDT as part of the last specifications process (see below).

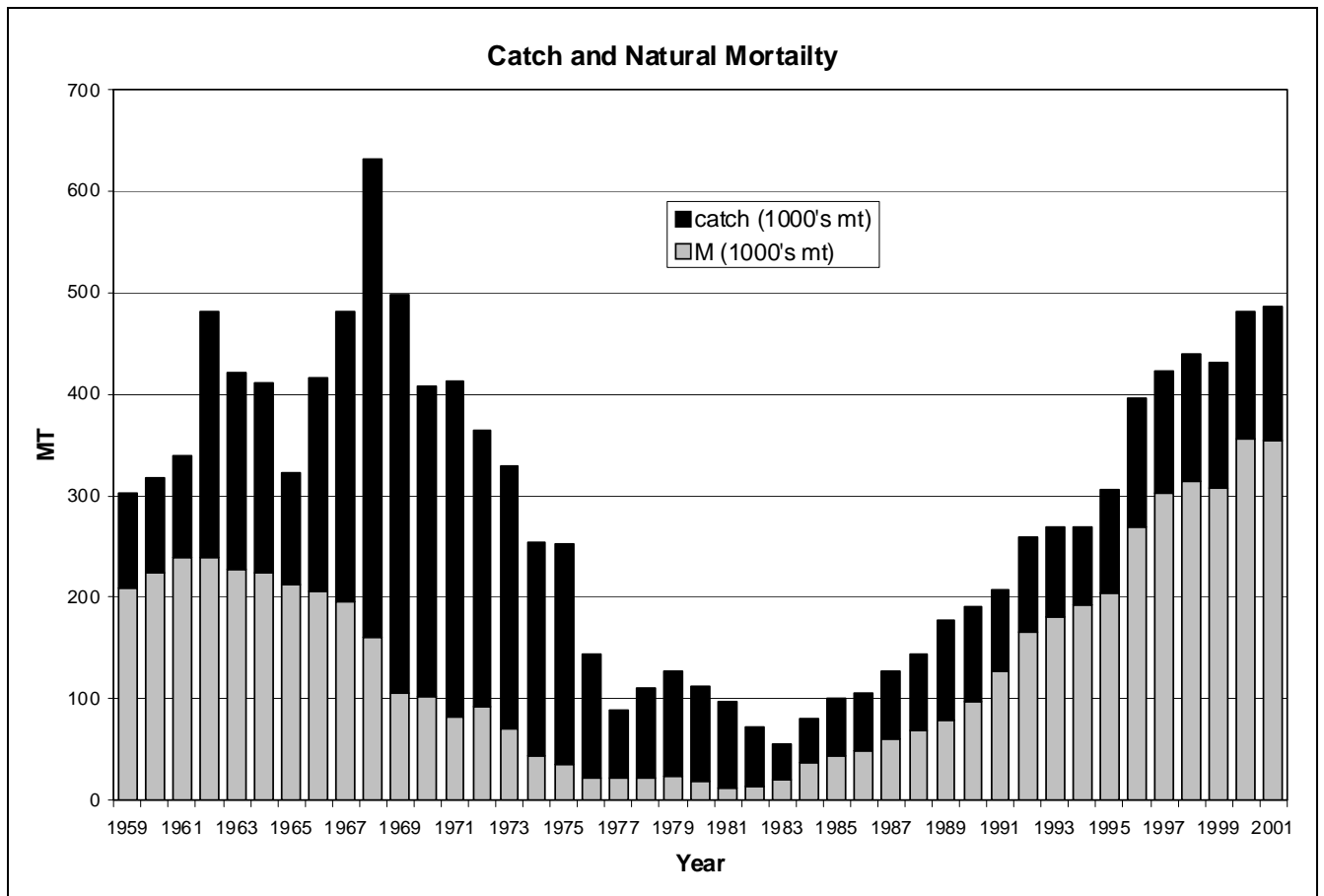
Current Assumptions Regarding Natural Mortality

Both stock assessment models (FPM and ADAPT VPA) that were reviewed at the last TRAC meeting (2006) for the Atlantic herring complex assume a natural mortality rate (M) of 0.2. This value is based on life-history characteristics and is fixed at this value across age classes and years. Much of the natural mortality incurred by Atlantic herring is attributable to predator consumption of herring. In addition to the stock assessment, the management program has been implicitly addressed the importance of herring as a forage species through establishing a precautionary proxy for MSY and a buffer between MSY and OY. Most of the natural mortality ($\sim 350,000$ mt year⁻¹) experienced by this forage species is probably due to predator removals.

Examination of removals due to M, as calculated by the FPM, can be seen in the graph of M removals and landings. While removals due to fishing and natural mortality have been roughly equal over the time series, current removals due to M are 3-3.5 times higher than removals by fishing.

The Herring PDT has concluded that the importance of herring as a forage species has been implicitly addressed through establishing a precautionary proxy for MSY (proposed in this amendment) and a buffer between MSY and OY, which is determined through the annual specification process. Even before setting these precautionary reference points, the amount of forage associated with natural mortality ($M = 0.2$, assumes 350,000 mt of forage) is believed to be within the range of what is consumed by predators on an annual basis (Figure 1). Additional information is needed to evaluate this conclusion in a more quantitative model over the long-term.

Figure 1 Herring Catch Relative to Removals from Natural Mortality (M)



(ADD DISCUSSION RE. TRAC 2009)

2.1.2.3 Impacts of Canadian Fishery for Atlantic Herring

Although herring currently is not managed jointly through a Resource Sharing Agreement with Canada, the stock assessment is conducted jointly through the Transboundary Resource Assessment Committee (TRAC), and Canadian landings of the Atlantic herring resource must be factored into decisions about U.S. herring fishery specifications and, in the future, U.S. ACLs. Catch of the Atlantic herring stock complex in Canadian waters consists primarily of fish caught in the New Brunswick (NB) weir fishery. The NB weir fishery is a historical fishery with catches that have been more variable in recent years, but have totaled more than 30,000 mt of herring in past years. In general, it is assumed that juvenile fish (age 1 and 2) caught in the NB weir fishery are from the inshore (GOM) component of the Atlantic herring stock complex, while adult fish (age 3+) caught in the NB weir fishery are from the SW Nova Scotia stock complex (4WX).

It is also assumed that fish caught in the NB weir fishery are from the inshore component of the herring resource that U.S. fishermen catch in the Gulf of Maine (and in Area 2 during the winter), and when determining U.S. fishery specifications and TACs, managers incorporate a catch of 20,000 mt from the NB weir fishery. Amendment 1 to the Herring FMP includes provisions to allow for this assumption to be modified by the PDT during the specification process, based on recent patterns and landings in the NB weir fishery. The assumed catch is subtracted from the available yield from the inshore component of the resource *before* TACs (ACLs) are determined for management areas in the U.S. Exclusive Economic Zone (EEZ). In the process proposed to establish ACLs in this amendment (see below), catch in the NB weir fishery will likely be subtracted or removed from consideration after specifying ABC and before establishing ACLs for the U.S. fishery. The Council could consider addressing the interaction of the U.S. and Canadian herring fisheries in a more direct manner in the future (perhaps through joint management or formal resource sharing).

2.1.2.4 State/Federal ACL Issues

NMFS Guidelines suggest that for stocks that have harvest in state or territorial waters, FMPs should include an ACL for the overall stock that may be further divided. For example, the overall ACL could be divided into a Federal ACL and a State ACL. When stocks are co-managed by Federal and State Agencies, the goal should be to develop collaborative conservation and management strategies, and scientific capacity to support such strategies, to prevent overfishing of shared stocks, and to ensure their sustainability.

Atlantic herring continues to be managed by the NEFMC in Federal waters and the ASMFC in State waters. However, the vast majority of the Atlantic herring resource is harvested in Federal waters. Catch by Federal permit holders that occurs in State waters is reported and counted against the TACs. Catch by state-only permit holders is monitored by the ASMFC and is not large enough to substantially affect management of the Federal fishery and the ability to remain under the TACs. While it may be something that the Council would want to consider in the future, it does not appear that there is a need at this time for a separate ACL to manage landings in State waters. The majority of Atlantic herring landings from State waters occurs in the State of Maine. A review of the ASMFC's State Compliance Reports for 2006 indicates that about 31,000 pounds (14 mt) of Atlantic herring were landed in CT from State waters only permit

holders. With the exception of Maine, no other states reported landings of herring from state waters fisheries during 2006. According to ME DMR, 252 mt of Atlantic herring were landed by weirs and stop seines in Maine during the months of June – September 2007, with the majority of landings occurring during June. An additional 25 mt was landed by other gear types in the state of Maine (gillnets, hooks, pound nets) during this year.

Current regulations for the herring fishery allow for 500 mt of the Area 1A TAC to be set aside for the fixed gear fisheries in Area 1A (weirs and stop seines, all in State waters) that occur west of Cutler. It is assumed that the set-aside for fixed gear fisheries will remain an option that the Council and ASMFC can consider during the specifications process. The 500 mt set-aside for fixed gear fisheries in Area 1A will be part of the ACL for Area 1A, just held in reserve by NMFS for fixed gear fishing until November 1.

The process proposed for establishing ACLs/AMs in this amendment (described in detail below) states that before ACLs are determined, an adjustment will be made for the catch that is expected to be harvested by Canadian fisheries (primarily the NB weir fishery) and fisheries within state waters by vessels that are not subject to the federal FMP. The deduction for landings from State waters is likely to be small, and the ASMFC and the Council will continue to work closely to establish the annual TACs in four management areas and sub-areas through the joint specification process. While ASMFC is not bound by the ACL/AM requirements of the MSRA, both agencies will continue to collaborate on management of the herring resource, consistent with the spirit and intent of the MSRA.

2.1.3 Introduction – Accountability Measures (AMs)

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

Current management measures for the Atlantic herring fishery again already provide a framework for addressing the AM requirements of the MSRA, as some types of accountability measures already exist in the fishery. The Atlantic Herring FMP includes measures that close a management area to directed fishing when 92% of the TAC is projected to be reached to minimize the risk of a TAC overage in any area while still allowing for incidental catch and cooperative research. Existing regulations also authorize the Regional Administrator to adjust any management area TACs during the fishing season, after consultation with the Council. In-season adjustments proposed by the Regional Administrator must be consistent with the Herring

FMP objectives and other provisions, two of which is to manage the herring resource at long-term sustainable levels and prevent overfishing. The TAC adjustments can be made by the Regional Administrator upwards (to better achieve OY) or downwards (to prevent overfishing). The current AMs in the Herring FMP are discussed in more detail in Section **XXX** of this document (AMs no action alternative).

NMFS' Guidelines propose the utilization of an Annual Catch Target (ACT) as an accountability measure. ACT is defined as an amount of annual catch of a stock or stock complex that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL. NMFS suggests that ACTs be utilized in fisheries without in-season management controls to prevent the ACL from being exceeded. The Atlantic herring management program currently comports with these guidelines in two ways: (1) authority for the Regional Administrator to make in-season adjustments to TACs; and (2) closure of the fishery at 92% to minimize the risk of exceeding the TAC. The current requirement to close directed fishing in a management area when 92% of the TAC is projected to be reached could, in fact, be considered an ACT for the herring fishery. Additional discussion is provided in the following subsections.

The current AMs in the Atlantic herring fishery are primarily the types of management measures that are designed to prevent the ACL from being reached. The Council is considering additional AMs in this amendment, some of which relate to the need to address ACL overages, should they occur in the future.

2.2 ACL ALTERNATIVE 1 – NO ACTION

Under this alternative, no action would be taken to modify the Atlantic herring fishery specification process and bring the Herring FMP into compliance with the new provisions of the MSRA that relate to establishing ACLs and AMs. The herring fishery specification process would remain unchanged from the current process, as modified in Amendment 1.

Discussion

The no action alternative is required by the National Environmental Policy Act (NEPA) and provides a benchmark, enabling decision makers to compare the magnitude of environmental impacts of other alternatives under consideration. In the context of setting ACLs/AMs, the no action alternative is not consistent with the Magnuson-Stevens Reauthorization Act (MSRA).

2.3 ACL ALTERNATIVE 2 – ACL/AM PROCESS (FISHERY SPECIFICATIONS)

This alternative would modify the current fishery specification process for Atlantic herring to ensure the Herring FMP's compliance with the new requirements of the MSRA relative to the requirement to establish ACLs and AMs in the fishery. New definitions, proposed changes to the administrative process for establishing fishery specifications, and new provisions, including consideration of accountability measures as part of the specification process, are discussed in detail in the following subsections.

While there is only one alternative proposed to modify the specifications process to ensure compliance with the MSRA, there are several options under consideration for establishing accountability measures (AMs) in the context of the administrative changes that are proposed.

2.3.1 Definitions

The following definitions define new terms used in this section.

Catch: Catch is defined in the NS1 Guidelines as the total quantity of fish, measured in weight or numbers of fish, taken in commercial, recreational, subsistence, tribal, and other fisheries. Catch includes fish that are retained for any purpose, as well as mortality of fish that are discarded. The ACLs established for the herring fishery should relate to total catch in the fishery, including landings and discards. A comprehensive catch monitoring program is proposed in this amendment and should reduce management uncertainty and help to ensure that ACLs are adequately monitored.

Stocks in the Fishery: Stocks in a fishery may be grouped into stock complexes as appropriate, and NMFS suggests groupings of “target stocks,” “non-target stocks,” and “ecosystem component (EC) species,” as appropriate. Target stocks are defined as stocks that fishers seek to catch for sale or personal use, including “economic discards” as defined in the MSRA. Any stocks that are formally identified as “stocks in the fishery” should be managed under the FMP and will require status determination criteria, other reference points, ACLs, and AMs.

The final NS1 Guidelines do not require the Council or the Secretary to include all target and non-target species as “stocks in a fishery.” They do not mandate the use of EC species and do not require inclusion of particular species in an FMP. The determination as to how a particular fishery should be defined remains within the authority and discretion of the Council.

For the purposes of this amendment and the Atlantic Herring FMP, the stock in the fishery is the target stock – **Atlantic herring**. While there are other species that are caught incidentally when fishing for Atlantic herring, the focus of the ACL/AM process in this amendment will be the stock directly managed by the Atlantic Herring FMP. Bycatch in the herring fishery will continue to be addressed and minimized to the extent possible, consistent with other requirements of the MSRA.

There may be non-target stocks that warrant consideration in the future when developing ACLs and AMs for the herring fishery, and the Council retains the ability to consider these for inclusion in this management program at a later date. At this time, the Herring FMP will not identify non-target species for management through ACLs until the primary FMP that manages the species in question identifies a sub-ACL that should be considered for the herring fishery.

OFL: Overfishing Level. The catch that results from applying the maximum fishing mortality threshold to a current or projected estimate of stock size. When the stock is not overfished and overfishing is not occurring, this is usually F_{MSY} or its proxy. Catches that exceed this amount would be expected to result in overfishing. The annual OFL can fluctuate above and below

MSY depending on the current size of the stock. This specification will replace the current specification of *allowable biological catch* in the herring fishery.

ABC: Acceptable Biological Catch. The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. ABC can equal but never exceed the OFL. ABC should be based on F_{MSY} or its proxy for the stock if overfishing is not occurring and/or the stock is not in a rebuilding program, and should be based on the rebuilding fishing mortality (F_{reb}) rate for the stock if it is in a rebuilding program. The specification of ABC will consider scientific uncertainty and will be recommended to the Council by its Scientific and Statistical Committee.

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

Based on the current (2008/2009) fishery specifications, this would equate to 145,000 mt, or the sum of the management area TACs for the herring fishery, which is also the current value of U.S. optimum yield (OY).

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

Table 1 Overview of New Definitions used in Proposed ACL Process

Acronym	Definition	Considerations
OFL	Catch at F_{MAX}	Current stock size
ABC	Catch at F_{MSY} or $F_{rebuild}$ \leq OFL	Biological uncertainty over current stock size, estimate of F , or other parameters (stock mixing ratios, recruitment, etc.)
ACL	\leq ABC	Uncertainty from other sources, evaluation of risk to achieving management goals if ABC is exceeded
AM	Accountability Measures	(1) minimizing risk of exceeding ACL during the fishing year; (2) addressing ACL overages, if they occur

Section 303(a)(4) of the MSRA requires FMPs to assess and specify:

- The capacity and the extent to which fishing vessels of the U.S., on an annual basis, will harvest the optimum yield specified in the FMP (domestic annual harvest, DAH);
- The portion of OY which, on an annual basis, will not be harvested by fishing vessels of the U.S. and can be made available for foreign fishing (total allowable level of foreign fishing, TALFF); and
- The capacity and extent to which U.S. fish processors, on an annual basis, will process that portion of OY that will be harvested by U.S. fishing vessels (domestic annual processing, DAP).

Part of OY may be held as a reserve to allow for factors such as uncertainties in estimates of stock size and DAH.

The assessments/specifications required by the MSRA are made every three years as part of the Atlantic herring fishery specification process. The current process for establishing catch limits and quotas in the Atlantic herring fishery includes specifications for: ABC (Allowable Biological Catch) for the Atlantic herring resource, U.S. OY, domestic annual harvest (DAH), domestic annual processing (DAP), joint venture processing (JVP), internal waters processing (IWP), U.S. at-sea processing (USAP), border transfer (BT), total allowable level of foreign fishing (TALFF), a reserve, total allowable catches (TACs) for each of the herring management areas, and research set-asides (RSAs) in any or all of the herring management areas.

Under the proposed action, the majority of these specifications will remain unchanged.

(Does the Committee/Council want to consider changes to the specifications themselves? For example, eliminating the specification for USAP? Eliminating the reserve? Others?)

The most notable changes to the specifications include the addition of a specification for OFL, elimination of the current ABC specification (*allowable biological catch*) and addition of the MSRA-defined ABC specification (*acceptable biological catch*), and the establishment of AMs. The Atlantic herring fishery is and will continue to be managed by hard TACs. A stock-wide ACL will be established, and the specification of sub-ACLs will relate to the management area TACs (see Table 2).

Table 2 Proposed Changes to Atlantic Herring Fishery Specifications

CURRENT SPECIFICATIONS	PROPOSED (AMENDMENT 4) SPECIFICATIONS
Allowable Biological Catch (ABC)	Overfishing Limit (OFL)
	Acceptable Biological Catch (ABC)
U.S. Optimum Yield (OY)	U.S. Optimum Yield (OY) (Stock-Wide ACL)
Domestic Annual Harvesting (DAH)	Domestic Annual Harvesting (DAH)
Domestic Annual Processing (DAP)	Domestic Annual Processing (DAP)
Total Joint Venture Processing (JVPT)	Total Joint Venture Processing (JVPT)
Joint Venture Processing (JVP)	Joint Venture Processing (JVP)
Internal Waters Processing (IWP)	Internal Waters Processing (IWP)
U.S. At-Sea Processing (USAP)	U.S. At-Sea Processing (USAP)
Border Transfer (BT)	Border Transfer (BT)
Total Allowable Level of Foreign Fishing (TALFF)	Total Allowable Level of Foreign Fishing (TALFF)
RESERVE	RESERVE
TAC Area 1A	TAC Area 1A (sub-ACL)
TAC Area 1B	TAC Area 1B (sub-ACL)
TAC Area 2	TAC Area 2 (sub-ACL)
TAC Area 3	TAC Area 3 (sub-ACL)
Research Set-Aside	Research Set-Aside (and/or Portside Sampling Set-Aside)

The assumed catch from the NB weir fishery is subtracted from the available yield from the inshore component of the resource *before* TACs are determined for management areas in the U.S. Exclusive Economic Zone (EEZ). In the process proposed to establish ACLs in this amendment, catch in the NB weir fishery will be subtracted or removed from consideration after specifying ABC and before establishing ACLs for the U.S. fishery. Landings from state-only permitted vessels also will be accounted for prior to establishing ACLs for the Federal fishery. Uncertainty related to future catch from the NB weir fishery may be factored into “management uncertainty” until a more direct approach for managing this transboundary stock is adopted.

2.3.2 Sub-ACLs and Other Possible ACL Sub-Components

While it is widely recognized that the herring resource is composed of different stock components (primarily inshore Gulf of Maine and offshore Georges Bank/southern New England components), assessment of the Atlantic herring resource remains complex-wide; data are not available at this time to generate a biomass estimate, apply a target fishing mortality rate, and estimate an appropriate level of yield specifically from the inshore component of the resource. Therefore, an ACL for the Atlantic herring stock complex as a whole should be established, which is based on the most recent stock assessment, accounts for scientific uncertainty, and is intended to prevent overfishing.

However, once an ACL for the Atlantic herring resource is specified, the Council may divide the ACL into *sub-components or sub-ACLs*. These ACL sub-components will facilitate management of the catch of the resource and its stock components throughout the range so that catch limits can be established to ensure that overfishing does not occur on individual stock components. This is the intent of the current process for establishing management area TACs in the herring fishery. The sub-ACLs can also provide for accountability measures to be implemented specifically for portions of the fishery that may be responsible for excessive catch if an ACL in a particular management area is exceeded. However, different AMs need not be developed for each management area unless the Council specifically chooses this approach; one suite of AMs may apply to all sub-ACLs. The AMs will be specified in this amendment and may be modified as part of the specifications package, along with supporting information and analysis. Modifications and additions to AMs for either the total ACL or any sub-ACLs may be included in the fishery specifications package as well.

Other ACL elements or sub-components may be adopted by the Council as part of this process for several reasons. Dividing the overall Atlantic herring ACL into smaller portions that are attributed to specific management areas (sub-ACLs) assures that the risk of overfishing individual stock components is minimized because the sub-ACLs are subject to AMs. However, the Council may also choose to identify smaller portions of catch that are not to be considered ACLs and are not to be subject to AMs. It is important to note that management controls on the portion of the fishery subject to accountability measures must be sufficient to prevent overfishing on the resource as a whole, which is highly likely to be the case for the Atlantic herring fishery at this time. Any non-ACL sub-components that are identified by the Council can be revised through either the fishery specifications process or the Herring FMP's framework adjustment process.

2.3.3 Administration: Atlantic Herring Fishery Specification Process

This section delineates changes to the administrative steps for setting specifications and establishing ACLs and AMs for the Atlantic herring fishery. The ACL process will become an element of the existing fishery specification process, which was modified to a three-year process in Amendment 1 to the Atlantic Herring FMP. The process will continue to be a three-year process.

The Atlantic herring fishery specification process requires the Herring PDT to prepare a stock assessment and fishery evaluation (SAFE) Report every three years. While a SAFE Report will only be prepared every three years, the Herring PDT is required to meet at least once during interim years to review updated scientific information and evaluate the status of the stock relative to the overfishing definition. Council action is not required on an annual basis to maintain the same specifications for all three fishing years, but the Council also has flexibility to adjust the specifications during the interim years based on recommendations from the Herring PDT or other reasons that may be identified. These provisions will remain unchanged.

Under the Proposed Action, as part of the specification process, the Herring PDT will develop recommendations for *Acceptable Biological Catch* (ABC) for the Atlantic herring resource over three fishing years based on the information provided in the SAFE Report. These recommendations form the basis for setting ACLs for the upcoming three fishing years. The Herring PDT recommendations will include the following elements:

- OFL estimates for the next three fishing years, based on the point estimates of F_{MSY} (or its proxy) and the point estimate of future stock size.
- ABC recommendations for the next three fishing years, based on either F_{MSY} (if the stock is not in a rebuilding program) or F_{reb} (if the stock is in a rebuilding program). If possible, the Herring PDT recommendation should report the catch that is expected to result from the point estimates of the target fishing mortality rate and projected stock size. If the PDT recommends reducing the ABC from this amount, the recommendation should include an explicit discussion of the scientific uncertainties that are taken into account in developing the recommendation. In order to evaluate these uncertainties, the PDT will develop an informal document that describes the issues that will be considered. This information will be provided for the consideration of the SSC and the Council and is not intended to be binding on either body.
- An evaluation whether the ABC and the ACLs have been exceeded in earlier years.

Scientific uncertainty should be identified and discussed in detail by the Herring PDT to assist the SSC during its deliberations regarding ABC. Several sources of scientific uncertainty may exist, and some of the sources that have been identified in the recent past are identified and discussed briefly in Section 2.1.2.1 of this document (p. 8).

As part of its three-year review, the Herring PDT will also develop a recommendation to the Council for setting ACLs for the upcoming fishing years. This report from the PDT should also include evaluation of current AMs and any suggested additions or modifications to the AMs for upcoming fishing year. This alternative allows for adjustments to AMs for the fishery to be implemented as part of the fishery specification process.

Before ACLs are determined, an adjustment will be made for the catch that is expected to be harvested by Canadian fisheries (primarily the NB weir fishery) and fisheries within state waters by vessels that are not subject to the federal FMP.

Because ACLs represent total catch (landings and discards), the specification process will provide the Herring PDT with flexibility to make adjustments, if necessary, to account for expected discards of herring prior to setting the ACLs. The need for a discard adjustment will depend in large part on the ability to accurately estimate discards of herring at the time when ACLs are set. It will also depend on how discards are treated in future stock assessments for Atlantic herring. The catch monitoring program proposed in this amendment may provide discard information sufficient to eliminate the need to adjust for discards prior to setting the ACLs, in which case the ACLs will be implemented and monitored as total catch limits. If an adjustment is made due to uncertainty about discards or the ability to accurately monitor them, then the ACLs would represent limits on landings.

Similar to developing its recommendations regarding the specification of ABC, the Herring PDT will consider management uncertainties when developing this recommendation, particularly relative to the AMs in the fishery. In order to evaluate these uncertainties, the Herring PDT will develop an informal document that describes the issues that will be considered. The Council may ask the SSC to comment on the PDT recommendations. The Herring PDT's ACL/AM recommendations should include:

- A summary indicating whether ABC and/or ACLs have been exceeded in recent years; as part of its evaluation, the Herring PDT may recommend changes to existing AMs or additional AMs to be included in the specifications for the upcoming three fishing years;
- Discussion of existing AMs in the fishery and their effectiveness;
- Recommendations for setting ACLs/AMs for the next three years – the Herring PDT will describe the uncertainties and risks considered when developing these recommendations.

Management uncertainty should be identified and discussed by the Herring PDT to assist the SSC during its development of recommendations regarding the proposed ACLs. Several sources of management uncertainty may exist, and some of the sources that have been identified in the recent past include (these examples are provided only to illustrate some of the factors the PDT and SSC may consider relative to management uncertainty):

- ***Catch in the NB Weir Fishery.*** As previously noted, catch from the NB weir fishery in Canada is assumed to consist of fish from the inshore component of the resource and must be deducted from the ABC before the U.S. ACLs can be established. Uncertainty about future catches from this fishery should be addressed until a more direct approach to joint management and/or resource sharing is adopted by both the U.S. and Canada.
- ***Total Catch in the U.S. Fishery.*** Total catch levels, including both landings and discards, can be difficult to estimate accurately in a real-time manner. Uncertainties regarding the amount of herring bycatch (discards) and the ability of managers to monitor the ACLs on a real-time basis should be considered when establishing ACLs and accounting for management uncertainty. Discard adjustments can be made prior to setting ACLs if warranted. Management measures under consideration in this amendment to establish a comprehensive catch monitoring program for the herring fishery (see Section XXX) may address this issue.

- ***Impact of ASMFC Management Measures on Fishing Patterns.*** The potential impact of ASMFC management measures such as spawning provisions (seasonal closures, for example) and days out provisions (to distribute the TAC/ACL across more of the fishing year) should be considered.

Evaluating the potential risk (of overfishing or exceeding the ABC or ACL) associated with a specific type of uncertainty (scientific or management) presents a new challenge for the PDT and SSC, which may be difficult to overcome. The trade-offs associated with various sources of uncertainty will need to be considered, and the SSC should provide information that describes how the sources of uncertainty are accounted for and addressed in the final recommendations. It will be very difficult, if not impossible, to quantify the impacts of and/or risk associated with many sources of uncertainty.

All Herring PDT recommendations and supporting information/analysis will be transmitted to the SSC for review, and the SSC will develop recommendations for ABC and provide comments/feedback on the PDT recommendations for establishing ACLs. Should the SSC recommend an ABC that differs from that originally recommend by the Herring PDT, the PDT will revise its ACL recommendations to be consistent.

2.3.4 Timing

Time permitting, the Council should develop the new fishery specifications over the course of two Council meetings. The first meeting, sometime between April – July, would be the first specification meeting to consider updated stock/fishery information and Herring PDT recommendations, and to identify/discuss any options under consideration for the fishery specifications, particularly relative to setting ACLs and AMs. The SSC would meet to review the information and develop its recommendations no later than July so that the Herring PDT can revise any recommendations for ACLs if necessary. The Council's second specification meeting would occur sometime from July-October to finalize the fishery specifications based on additional feedback from the Herring PDT, SSC recommendations regarding ABC, and input from the Herring Committee and Advisory Panel. To be effective on January 1, the specifications should be submitted to NMFS prior to the end of September to allow adequate time for review and implementation at the start of the fishing year. Timelines are not requirements, just general expectations and guidelines for adhering to the specification process. If timing is an issue, the Council may delegate the initial review and development of ACL/AM options to the Herring Committee.

The Herring PDT recommendations for setting ABC and the associated ACLs/AMs will be provided to the SSC prior to the Council meeting scheduled for final action. Guided by terms of reference prepared by the Council, the SSC will review the Herring PDT recommendations and will develop its recommendation(s) for ABC and comments on the ACL/AM options. As part of the review, the SSC will explicitly describe the elements of scientific uncertainty that were considered in developing its recommendations. This would form the basis of the ABC control rule. If requested by the Council, the SSC may comment on the uncertainty and risk that should be considered by the Council when setting ACLs and whether the Herring PDT has identified those elements sufficiently for Council consideration. If the SSC recommends an ABC that

differs from the PDT recommendation, the PDT will revise its ACL recommendations using the new ABC.

The Council will consider the ABC recommendation of the SSC and the ACL recommendations of the Herring PDT and should make a decision on those recommendations for the upcoming fishing years as part of the specifications process. If the Council questions the SSC recommendation, it can ask for a more detailed explanation from the SSC, but the Council must establish ACLs that are equal to or lower than the ABC recommended by the SSC. When setting ACLs, the Council will consider the advice of the SSC and the Herring PDT and will provide the rationale used for setting the ACLs. Once the Council has approved ACLs, they should be submitted to NMFS as soon as possible for approval and implementation in the upcoming year (January 1).

After receipt of the Council decision for ACLs and submission of the full herring specifications package for three fishing years, NMFS would review the Council's decision and, if consistent with applicable law, would implement the ACL consistent with the Administrative Procedures Act (APA).

2.3.5 Accountability Measures (AMs)

Accountability measures will be established as necessary in this amendment and may be established or modified in the future as part of the herring fishery specifications process and/or the framework adjustment process.

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

2.3.5.1 AM Alternative 1 – No Action (Current AMs)

This alternative would maintain the current suite of management measures in the Atlantic herring fishery that are considered AMs. These measures are designed primarily to prevent the management area TACs (ACLs) from being exceeded during the fishing year, as well as improve the likelihood that OY can be caught on a continuing basis while preventing overfishing. The current AMs in the herring fishery are described below.

In-season Adjustments to TACs

Current regulations in the Atlantic herring fishery grant authority to the NMFS Regional Administrator to adjust any of the management area TACs for herring during the fishing year, after consultation with the Council. The Regional Administrator must publish notification in the Federal Register of any changes to the TACs, along with reasons for making the changes, which must be consistent with the Herring FMP objectives and management program, one of which is to prevent overfishing and manage the Atlantic herring fishery at long-term sustainable levels. The current regulations are provided below:

- (1) The specifications and TACs established pursuant to this section may be adjusted by NMFS, after consulting with the Council, during the fishing year by publishing notification in the Federal Register stating the reasons for such action and providing an opportunity for prior public comment. Any adjustments must be consistent with the Atlantic Herring FMP objectives and other FMP provisions.*
- (2) If a total allowable catch reserve (TAC reserve) is specified for an area, NMFS may make any or all of that TAC reserve available to fishers after consulting with the Council. NMFS shall propose any release of the TAC reserve in the Federal Register and provide an opportunity for public comment. After considering any comments received, any release of the TAC reserve shall be announced through notification in the Federal Register.*

Note: While current regulations do allow for in-season adjustments to the TACs, as described above, they were not written for consistency with the new requirements of the MSRA and may require modification to serve more effectively as an accountability measure. The regulations are not specific regarding the reasons why the Regional Administrator may want to adjust any TACs, they do not provide a trigger or threshold for action, and they include a requirement for public comment and therefore may not allow for adjustments to be made in a timely manner.

Management Area Closures

Currently, the directed fishery for herring in a given management area is closed when 92% of the TAC is projected to be reached; 3% of the TAC is set-aside for research, and the other 5% is provided after the closure to account for incidental catch fishing under a 2,000 pound trip limit. Without considering the 3% research set-aside, closing the directed fishery at a 95% projected catch level helps to minimize the risk of exceeding 100% of the TAC during the fishing year. Once the fishery is closed, all vessels are limited to 2,000 pounds of Atlantic herring, which is accounted for through the 5% set-aside or “buffer” that remains available. The current regulations are provided below:

- (a) If NMFS determines that catch will reach 95 percent of the annual TAC allocated to a management area before the end of the fishing year, or 95 percent of the Area 1A TAC allocated to the first seasonal period as set forth in paragraph (f) of this section, NMFS shall prohibit vessels, beginning the date the catch is projected to reach 95 percent of the TAC, from fishing for, possessing, catching, transferring, or landing >2,000 lb (907.2 kg) of Atlantic herring per trip and/or >2,000 lb (907.2 kg) of Atlantic herring per day in such area pursuant to paragraph (e) of this section, except as provided in paragraphs (c) and (d) of*

this section. These limits shall be enforced based on a calendar day, without regard to the length of the trip.

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

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

This AM can, in fact, be considered an ACT, consistent with NMFS' Guidelines.

Provisions for Framework Adjustments to the Herring FMP

The framework adjustment process provides the Council an opportunity to modify existing management measures and/or implement some additional measures in a timely manner, through a process that is much more abbreviated than a plan amendment. Framework adjustments are usually developed over the course of two Council meetings and submitted with an Environmental Assessment (versus a full EIS) if it is found that the adjustment will have no significant impacts beyond those predicted in the scope of the original management action. Many different management measures can be implemented and/or adjusted through the framework adjustment process. Therefore, it is possible that the Council can utilize the framework adjustment process to modify or implement additional accountability measures during a fishing year, or in time for the following fishing year if a TAC overage needs to be addressed. The current regulations are provided below:

(a) Framework adjustment process. In response to the triennial review, or at any other time, the Council may initiate action to add or adjust management measures if it finds that action is necessary to meet or be consistent with the goals and objectives of the Atlantic Herring FMP, or to address gear conflicts as defined under §600.10 of this chapter.

(b) Possible framework adjustment measures. Measures that may be changed or implemented through framework action include:

- (1) Management area boundaries or additional management areas;*
- (2) Size, timing, or location of new or existing spawning area closures;*
- (3) Closed areas other than spawning closures;*
- (4) Restrictions in the amount of fishing time;*
- (5) A days-at-sea system;*
- (6) Adjustments to specifications;*

- (7) *Adjustments to the Canadian catch deducted when determining specifications;*
- (8) *Distribution of the TAC;*
- (9) *Gear restrictions (such as mesh size, etc.) or requirements (such as bycatch-reduction devices, etc.);*
- (10) *Vessel size or horsepower restrictions;*
- (11) *Closed seasons;*
- (12) *Minimum fish size;*
- (13) *Trip limits;*
- (14) *Seasonal, area, or industry sector quotas;*
- (15) *Measures to describe and identify essential fish habitat (EFH), fishing gear management measures to protect EFH, and designation of habitat areas of particular concern within EFH;*
- (16) *Measures to facilitate aquaculture, such as minimum fish sizes, gear restrictions, minimum mesh sizes, possession limits, tagging requirements, monitoring requirements, reporting requirements, permit restrictions, area closures, establishment of special management areas or zones, and any other measures included in the FMP;*
- (17) *Changes to the overfishing definition;*
- (18) *Vessel monitoring system requirements;*
- (19) *Limits or restrictions on the harvest of herring for specific uses;*
- (20) *Quota monitoring tools, such as vessel, operator, or dealer reporting requirements;*
- (21) *Permit and vessel upgrading restrictions;*
- (22) *Implementation of measures to reduce gear conflicts, such as mandatory monitoring of a radio channel by fishing vessels, gear location reporting by fixed gear fishermen, mandatory plotting of gear by mobile fishermen, standards of operation when conflict occurs, fixed gear marking or setting practices; gear restrictions for certain areas, vessel monitoring systems, restrictions on the maximum number of fishing vessels, and special permitting conditions;*
- (23) *Limited entry or controlled access system;*
- (24) *Specification of the amount of herring to be used for roe*
- (25) *In-season adjustments to TACs;*
- (26) *Measures to address bycatch and bycatch monitoring;*
- (27) *Requirements for a herring processor survey;*
- (28) *TAC set-aside amounts, provisions, adjustments; and*
- (29) *Any other measure currently included in the FMP.*

Additional Measures – ASMFC

The ASMFC Interstate FMP for Atlantic Herring includes management measures that are intended to control fishing effort under the TACs and extend the availability of herring for the fishery throughout more of the year. While these measures may not be formally considered as

part of the existing AMs under the MSRA provisions (because herring is not jointly managed by the Council and ASMFC), they are recognized as additional measures that may benefit the resource and fishery and may improve managers' ability to monitor ACLs and ensure that they are not exceeded. Measures intended to stretch available TAC across more of the fishing year and/or slow the race to fish in a particular management area may not directly serve as AMs, but they will allow managers to better gauge/predict when the fishery will come close to reaching an ACL in a given area.

"Days out" provisions are the primary effort control measures in the ASMFC's herring management program and are intended to prolong the entire TAC for times of the year when herring is typically in peak demand. If catch rates in an area are projected to get harvested early, States can implement 'days out' of the fishery to control effort. Fishermen are prohibited from landing herring during a day out but may still fish and catch them. Days out were designed to prolong the TAC in an area in order to ensure a steady supply of herring, giving fishermen and industry the ability to set long term business strategies and shift fishing pressure to other management areas. The Section has only needed to implement 'days out' in Area 1A to control catch rates, although they have the ability to set days out in the other management areas as well.

2.3.5.2 AM Alternative 2 – Additional AMs

This alternative would establish AMs in addition to those described under the no action alternative. The additional AMs would be established in this amendment and could be modified in the future through a framework adjustment to the Herring FMP, or through the herring fishery specification process. When the Council develops ACLs during the specification process, it can modify any existing AMs, implement additional AMs, and/or address the need for unique AMs in a particular management area(s).

Options for additional AMs are described below. The AMs proposed in this amendment are intended to apply to all herring ACLs that may be established during the fishery specification process (total Atlantic herring ACL and any management area sub-ACLs).

Precautionary AMs

AMs established to minimize the risk of exceeding an ACL in a given management area can be considered **Precautionary AMs**. In addition to the precautionary AMs that already exist in the herring management program (in-season adjustments, management area closures, and framework adjustment provisions), the Herring Committee/Council may want to consider some or all of the following options for additional AMs:

- **No Action Option: Rely on existing suite of AMs.**
- **Option 1: Include language in the amendment to authorize NMFS to completely close the fishery in a management area when 100% of the ACL is projected to be reached.** NMFS Guidelines suggest that provisions for in-season adjustments should include language that gives NMFS the ability to close a fishery if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of a fishery is necessary to prevent overfishing. Without considering the 3% research

set-aside, closing the directed fishery at a 95% projected catch level helps to minimize the risk of exceeding 100% of the TAC during the fishing year. The lower percentage threshold for closure – whether it is 92% or 95% - essentially serves as an ACT. Once the fishery is closed, all vessels are limited to 2,000 pounds of Atlantic herring, which is accounted for through the 5% set-aside or “buffer” that remains available. This option would allow NMFS to completely close the fishery and prohibit all landings of herring if 100% of the ACL is projected to be reached. This would serve as a precautionary accountability measure to ensure that the ACL is not exceeded.

- **Option 2: Closure of a management area at a lower percentage of the ACL.** Currently, the directed fishery for herring in a given management area is closed when 92% of the TAC is projected to be reached; 3% of the TAC is set-aside for research, and the other 5% is provided after the closure to account for incidental catch fishing under a 2,000 pound trip limit. This provision essentially establishes an ACT (annual catch target), which is recommended by NMFS as an AM for fisheries that do not utilize in-season management controls. The Atlantic herring fishery already utilizes both in-season management controls and ACTs. Once the fishery is closed, all vessels are limited to 2,000 pounds of Atlantic herring, which is accounted for through the 5% set-aside or “buffer” that remains available.

Depending on the degree of management uncertainty, the Council could consider a lower ACT, which would close the herring fishery at a lower percentage of the TAC/ACL. This would account for uncertainty regarding real-time monitoring and/or related estimates of the total catch. This management measure may or may not be necessary depending on the management measures implemented for the herring catch monitoring program in this amendment, and this option should be considered in the context of the proposed catch monitoring program. In addition, an option is proposed below for a consequential AM that would reduce the ACT in the following fishing year if an ACL is exceeded.

- **Option 3: Establishing a threshold/trigger for an in-season adjustment to the ACL.** As previously noted, current regulations in the Atlantic herring fishery grant authority to the NMFS Regional Administrator to adjust any of the management area TACs for herring during the fishing year, after consultation with the Council. The Council could consider establishing a threshold (% of ACL, for example) that would trigger a review by the RA to determine if in-season adjustments are necessary to ensure that the ACL in a management area is not exceeded during the fishing year. If this option is selected, the provisions should state clearly what the trigger would be and what in-season actions/adjustments the RA may want to consider during the review.

Consequential AMs

AMs established to address an ACL overage in a given management area can be considered **Consequential AMs**. Currently, few consequential AMs exist in the herring management program. The framework adjustment process could be utilized to address ACL overages, but timing is a challenge, and it is not certain that framework measures could be implemented during the following fishing year to address an overage in the prior year. As a result, the Herring Committee/Council may want to consider addressing the need for consequential AMs through some or all of the following possible approaches:

- **No Action Option:** Because many precautionary AMs already exist and/or are being considered in this amendment, and because the proposed catch monitoring program is intended to enhance monitoring and management of ACLs, it may not be necessary to establish consequential AMs at this time. Herring fishery specifications will likely be established for three fishing years, with AMs that would be triggered during any of those years as necessary. ACLs and AMs also can be adjusted during the interim years at any time, if the Council deems it necessary to make adjustments. The framework adjustment process could be utilized to implement consequential AMs if they are necessary during a three-year specification period.
- **Option 1: Lower the ACT for following fishing year.** Provisions could be established to automatically reduce the ACT (the percentage trigger for closing the directed fishery) in any management area where an ACL (or sub-ACL) overage occurs. For example, if final data indicate the ACL in a management area was exceeded by 3% during the fishing year, then following fishing year's ACT would be reduced to 89% of the ACL instead of (currently) 92% of the ACL. NMFS would evaluate all available data and publish the change to the ACT in the Federal Register as soon as possible during the following fishing year. The directed fishery for herring in the area would close earlier to avoid exceeding the ACL in the following year, and the lowered ACT would essentially serve as a payback for the overage.
- **Option 2: ACL overage payback provisions.** Provisions could be established to deduct ACL/sub-ACL overages in one fishing year from the corresponding ACL/sub-ACL in the next fishing year. In the scup fishery, for example, regulations for quota-setting state that landings in excess of the allocation will be deducted from the appropriate quota period for the following year in the final rule that establishes the annual quota. The Council could establish a similar process to address ACL overages in the Atlantic herring fishery. *In terms of sub-ACL overages, the Council may want to consider measures that would require the payback only when it is determined that there may be a negative biological consequence on the stock or stock component resulting from the sub-ACL overage.*

Important Considerations for Establishing AMs

- Stock component mixing and uncertainties associated with Atlantic herring stock structure present a unique challenge for establishing AMs. Measures that affect the spatial and temporal distribution of fishing patterns, including additional AMs, must account for stock component mixing.
- The impacts of catch from the NB weir fishery and uncertainty associated with future catch from this fishery may influence ACLs and the effectiveness of AMs. The Council could establish ACLs in a precautionary manner, including AMs to ensure the ACLs are not exceeded, but catch in the NB weir fishery cannot be controlled by this FMP and could increase such that the total ABC for the herring stock complex is exceeded. Coordinated management efforts with Canada in the future will be necessary to ensure the long-term success of the Atlantic herring management program.
- Coordination with ASMFC regarding the establishment and implementation of AMs will be important to ensure the success of the management program and ability to keep fishing effort

consistently at or below the ACL levels. The ASMFC is not required to comply with the MSRA and the new provisions for ACLs and AMs in all managed fisheries.

3.0 MEASURES TO ESTABLISH A CATCH MONITORING PROGRAM FOR THE ATLANTIC HERRING FISHERY

3.1 BACKGROUND

The Council has identified *catch monitoring* as a primary management issue for consideration in Amendment 4 and has directed the Herring Committee to focus on the development of specific management alternatives to improve catch monitoring in the herring fishery. “Catch monitoring” is intended to be comprehensive in nature and relates to improving the collection of information regarding shoreside (landings of herring and other species) and at-sea catch (including bycatch/discards), as well as improving vessel/dealer reporting and real-time quota (TAC) monitoring.

A catch monitoring program for the Atlantic herring fishery that supplements and improves the existing program can take on many forms and include several different approaches. In general, two important elements of the fishery must be adequately documented to improve catch monitoring and ensure that data are as complete and accurate as possible: (1) **at-sea catch**; and (2) **shoreside/dockside landings**. At-sea monitoring should focus on both total catch and bycatch – everything that enters the net and is either pumped aboard the fishing vessel or discarded at sea. Shoreside/dockside monitoring should focus on accurate and real-time accounting of landings and incidental catch – all fish are brought to port and offloaded from the vessel, either to a processing plant, a bait truck/dealer, other fish dealers, or to be disposed of as bycatch.

Another important element of catch monitoring is improving reporting and ensuring real-time monitoring of the management area TACs for the herring fishery. **XXX**

3.1.1 Standardized Bycatch Reporting Methodology

Amendment 2 to the Atlantic Herring FMP was developed by NMFS to ensure that all FMPs of the Northeast Region comply with the Standardized Bycatch Reporting Methodology (SBRM) requirements of the Magnuson-Stevens Act. The purpose of the SBRM amendment was to: (1) explain the methods and processes by which bycatch is currently monitored and assessed for Northeast Region fisheries; (2) determine whether these methods and processes need to be modified and/or supplemented; (3) establish standards of precision for bycatch estimation for all Northeast Region fisheries; and (4) document the SBRMs established for all fisheries managed through the FMPs of the Northeast Region.

Generally, a SBRM can be viewed as a combination of sampling design, data collection procedures, and analyses used to estimate bycatch. The Northeast Region SBRM amendment provides a structured approach for evaluating the effectiveness of the allocation of fisheries observer effort across multiple fisheries to monitor a large number of species. Both precision and accuracy are addressed in analyses conducted using observer data and to determine the

appropriateness of the data for use in stock assessments and by fishery managers. A coefficient of variation (CV) of thirty percent (30%) was selected as a standard level of precision based upon the recommendation of the National Working Group on Bycatch.

The SBRM amendment, therefore, establishes a baseline and target levels of observer coverage for accurately monitoring bycatch across the Northeast Region's federally-managed fisheries. However, the Council acknowledges that recent developments in the herring fishery have contributed to the need for improved monitoring of catch in the fishery (landings and discards). For instance, increased concerns about the status of river herring and some groundfish stocks, as well as uncertainty regarding the nature and extent of river herring and groundfish bycatch in the Atlantic herring fishery illustrate the need for more and better bycatch information. Seasonal and annual TAC overages in some management areas, inconsistent and inadequate levels of observer coverage, and the emergence of U.S. at-sea processing operations also argue for a more thorough and accurate catch monitoring program in the fishery. For these reasons, the Council is considering management measures in this amendment to supplement the baseline established in the SBRM and enhance the collection of bycatch information in the Atlantic herring fishery.

3.1.2 Catch Monitoring Measures – Additional Questions for Consideration/Discussion

A thorough understanding of the strengths and weaknesses of the existing catch monitoring program is a fundamental first step towards designing a new and better program. This has been the focus of the Herring Committee and Advisory Panel's discussions during and since the initiation of Amendment 4. The existing catch monitoring program will be described in detail and evaluated to the extent possible as part of the description and discussion of the no action alternative in the Amendment 4 Draft EIS.

Two important elements of a comprehensive catch monitoring program for the Atlantic herring fishery have been generally considered and require further guidance by the Committee and Council – dockside monitoring and at-sea monitoring. To facilitate discussion of important issues related to catch monitoring, Council staff developed the following list of questions for the Herring Committee to consider. This is not an exhaustive list, and discussing some of these issues will inevitably lead to more questions and issues to resolve. These questions are similar to those discussed by the Groundfish Committee during the development of sector monitoring measures in Amendment 16 to the Multispecies FMP.

The intent of the following list is to raise some issues for the Committee and Council to consider and discuss at the upcoming meetings in order to develop more clear guidance for Council staff, the Herring PDT, and the Advisory Panel to continue to work on the development of catch monitoring alternatives for this amendment.

Dockside Monitoring – Discussion Questions

- What is meant by *dockside monitoring*? What would be the specific goals of a dockside monitoring program established in this amendment? What current problems with catch/quota monitoring would the dockside monitoring program intend to address?
- Would all trips by herring vessels need to be monitored, or only a subset? If not all trips, then how is the subset or representative sample determined?

- Would landings need to be weighed by the dockside monitor, or can the monitor witness weighing by another party (e.g. dealer)?
 - If so, what amount of catch needs to be weighed? 100%? 50%?
 - If not 100%, should weighing be random?
 - How should the high volume of landings be measured by the dockside monitor? Should measures be considered to require that all fish be weighed (versus current methods of volumetric measurement)?
 - Would all ports need similar weighing technologies and rules? What infrastructure would be required?
 - If so, how can a plan accommodate smaller ports? Island communities?
 - What if landings are trucked to another port for sale?
 - How would deliveries of herring to island communities for bait be monitored?
- What should be the role of the Agency and independent contractors in a dockside monitoring system?
- Is there a role for video or electronic monitoring systems as part of dockside monitoring at this time?
- What is a reasonable time frame for implementation of dockside monitoring measures? Will the industry have time to develop the necessary infrastructure to accommodate changes to the monitoring system?
- Would the monitor submit a separate report? What would it contain?

At-Sea Monitoring – Discussion Questions

- What is meant by *at-sea monitoring*? What would be the specific goals of an at-sea monitoring program established in this amendment? What current problems with at-sea monitoring would the program intend to address?
- How would an at-sea monitoring program established in this amendment differ (or not) from the current observer program administered by NOAA Fisheries (NEFSC Sea Sampling Branch)?
- What is the appropriate extent of observer coverage to meet the desired goal(s)? Is 100% coverage necessary? Or is it sufficient to meet a defined standard, such as the C.V. suggested by NMFS?
- What are the desired roles of government and private parties in an observer system?
- What would be the role of the NMFS observers and any other at-sea monitors? Should they simply ensure that discards do not occur, or play a more active role in information-gathering?
- Who should be responsible for bearing the costs of observer programs?
 - If industry-funded observers are used, how should the program be structured? What are the biggest challenges to address if industry-funded observer programs are considered in this amendment?
 - What reports would industry-funded observers file and how would they be used? Who would maintain the database, and where would the resources come from to do so?

- Could third-party funding be considered for observer coverage in the herring fishery? If so, how would this approach be structured?
- Would NMFS require additional resources and manpower to implement and administer industry-funded observer programs? If so, how will these costs be addressed?
- Could electronic monitoring be an effective cost-reduction tool to improve at-sea monitoring?
 - Is there a role for electronic monitoring at-sea in the herring fishery at this time? If so, what technology would be required? What are the costs and who would bear them?
 - In what form would data be collected from an electronic monitoring program, and how would it be utilized? Who would maintain the database?
 - Should the Council consider developing a pilot project to explore possible applications for at-sea electronic monitoring in this amendment? What kind of incentives could be offered to participate in such a program?

3.1.3 Development of Specific Management Alternatives for Catch Monitoring in the Amendment 4 Draft EIS

The Herring Committee, in consultation with the Herring AP and PDT, has reviewed and discussed numerous detailed scoping comments regarding the establishment of catch monitoring measures in this amendment. In addition, the Committee has received reports and presentations from individuals on the Herring PDT who work closely with the NOAA Fisheries Sea Sampling (Observer) Program as well as portside/dockside samplers and those who have participated in related research projects.

The catch monitoring measures under consideration in this amendment are still in the early stages of development, as the issues are quite complicated, and input regarding the kinds of approaches that should be considered has been very extensive.

Several management measures under consideration for catch monitoring in Amendment 4 are described individually in this document so that each measure can be evaluated independently in terms of costs, benefits, and the nature and utility of the information it may generate. Ultimately, the Committee/Council will merge the measures described in the following sections to formulate more comprehensive management alternatives for further consideration and analysis in the Draft EIS for Amendment 4. The catch monitoring alternatives that are evaluated in the DEIS will be “packages” that incorporate various measures/options described in the following sections. To the extent possible, the analyses provided in the DEIS will consider the interaction between the catch monitoring measures and the potential cumulative impacts of the measures on the resource and the fishery.

3.2 GOALS AND OBJECTIVES

The goals (numbered) and objectives (bulleted) of the catch monitoring program established in Amendment 4 are:

- (1) To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species 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 sea sampling of at-sea processors' catches is at least equal to shoreside sampling;
 - Reconcile differences in federal and states' protocols for sea sampling and dockside sampling, and implement consistent dockside protocols to increase sample size and enhance trip sampling resolution.

3.3 MEASURES THAT CAN BE INCORPORATED INTO ANY CATCH MONITORING ALTERNATIVE

The following subsections describe proposed management measures that can be incorporated into any of the catch monitoring alternatives that the Council is considering in this amendment (alternatives are described in Sections XXX of this document). Measures that can be incorporated into any alternative include measures to improve quota monitoring, reporting, and compliance; measures to address the transfer of herring at-sea; measures to eliminate reporting redundancies; and measures to enhance at-sea monitoring (observer coverage). Options under consideration are described in detail in the following subsections.

3.3.1 Measures to Improve Quota Monitoring, Reporting, and Compliance

Increasing compliance with reporting will help to improve the accuracy of landings data and quota/TAC monitoring, which will lead to more effective management of the herring fishery. The Council is considering management measures to provide for real-time quota monitoring to the extent possible. The following subsections describe the measures that are currently under consideration/development by the Herring Committee to improve real-time quota monitoring, reporting, and compliance. Some of these measures may ultimately be incorporated into the management alternatives for the Draft EIS, while others may be considered but rejected, based on available information/analysis and feedback from the industry, Herring Advisory Panel, and other interested stakeholders.

At the March 2008 Herring Committee Meeting, during the development of the Scoping Document for Amendment 4, NMFS Regional Office staff presented a summary to the Herring Committee detailing the current program for monitoring landings in the Atlantic herring fishery and the process by which NMFS currently ensures compliance with the management area TACs. Several Herring Committee and audience members asked questions about how the TACs are monitored, and several individuals identified issues of concern and potential areas for improving the current process.

At the May 22, 2008 Herring Committee meeting, individuals from the NEFSC Sea Sampling (Observer) Program provided a detailed presentation on the structure of the current observer program and the data collected on observed vessels participating in the Atlantic herring fishery. Numerous individuals from the Observer Program attended the meeting with summary handouts and visual displays illustrating how observers work to collect data on fishing vessels. Following the observer presentation, a Herring PDT member provided an overview of portside bycatch sampling work in the herring fishery, which has been conducted by the ME Department of Marine Resources (see May 22, 2008 Meeting Summary for more detailed information and presentation slides).

At the July 30, 2008 Joint Committee/Advisory Panel Meeting, NMFS Regional Office presented a “permit holder letter” that was released on July 29, 2008 by NOAA Fisheries. The intent of the letter is to provide detailed examples and clarify the current notification and reporting requirements for vessels participating in the Atlantic herring fishery. NMFS staff

answered a number of questions for the Committee and Advisory Panel members, as well as the audience. The Committee and Advisory Panel engaged in a general discussion with the Regional Office about current reporting and notification requirements.

The following management measures under consideration have been identified by the Herring Committee, Advisory Panel, and PDT during the discussions related to the current catch monitoring program; these measures would be intended to address some of the potential problems or inadequacies associated with the current catch monitoring program that have been identified by NMFS, the industry, and/or other stakeholders. As the Committee and Council continue to move forward with the development of the catch monitoring alternatives in Amendment 4, it will also be important to detail the strengths and weaknesses of the measures under consideration so that the catch monitoring alternative that is ultimately adopted in Amendment 4 is successful and efficient, and provides accurate and real-time data to the extent possible.

3.3.1.1 Section 648.2 and 648.4 – Regulatory Definitions and Vessel Permits

Establishing a catch monitoring program for the Atlantic herring fishery in Amendment 4 provides an opportunity to review and possibly modify/clarify existing regulatory definitions and current permit/reporting provisions as they pertain to reporting Atlantic herring fishing activity. Some modifications may help to improve reporting compliance, ensure accuracy and completeness of data, and improve consistency between databases.

Existing Regulatory Definitions (Status Quo)

Section 648.2 Atlantic herring carrier means a fishing vessel that may receive and transport herring caught by another fishing vessel, provided the vessel has been issued a herring permit, does not have any gear on board capable of catching or processing herring, and has on board a letter of authorization from the Regional Administrator to transport herring caught by another fishing vessel.

Section 648.4(a)(10) (ii) currently specifies the following provisions for an Atlantic herring carrier:

An Atlantic herring carrier must have been issued and have on board a herring permit and a letter of authorization to receive and transport Atlantic herring caught by another permitted fishing vessel. The letter of authorization exempts such a vessel from the VMS and IVR vessel reporting requirements as specified in §648.7 and subpart K of this part, except as otherwise required by this part. An Atlantic herring carrier vessel must request and obtain a letter of authorization from the Regional Administrator, and must report all herring carried from each vessel on a given trip in its Fishing Vessel Trip Report. The Fishing Vessel Trip Report must include the vessel name. Carrier vessels under a letter of authorization may not conduct fishing activities except for purposes of transport or possess any fishing gear on board the vessel; must be used exclusively as an Atlantic herring carrier vessel; and must carry observers if required by NMFS. There is a minimum enrollment period of 7 calendar days. While operating under a valid LOA, such vessels are exempt from any herring possession limits associated with the herring vessel permit categories. Herring carrier vessels under an LOA may not possess, transfer, or land any species

except for Atlantic herring, except that they may possess Northeast multispecies transferred by vessels issued either an All Areas Limited Access Herring Permit and/or an Areas 2 and 3 Limited Access Herring Permit, consistent with the applicable possession limits for such vessels.

Section 648.2 Atlantic herring dealer means:

(1) Any person who purchases or receives for a commercial purpose other than solely for transport or pumping operations any herring from a vessel issued a Federal Atlantic herring permit, whether offloaded directly from the vessel or from a shore-based pump, for any purpose other than for the purchaser's own use as bait; or

(2) Any person owning or operating a processing vessel that receives any Atlantic herring from a vessel issued a Federal Atlantic herring permit whether at sea or in port.

- This means that any Atlantic herring carriers that sell fish (i.e., "receive for commercial purpose other than solely for transport") are considered Atlantic herring dealers and are subject to dealer reporting requirements. This is an important clarification. ***To improve reporting, the Council may want to consider clearly distinguishing Atlantic herring carriers from Atlantic herring carrier/dealers in this amendment.***

Section 648.2 Atlantic herring processor means a person who receives unprocessed Atlantic herring from a fishing vessel issued a Federal Atlantic herring permit or from an Atlantic herring dealer for the purposes of processing; or the owner or operator of a fishing vessel that processes Atlantic herring; or an Atlantic herring dealer who purchases Atlantic herring from a fishing vessel with a Federal Atlantic herring permit for resale as bait.

Section 648.2 Dealer means any person who receives, for a commercial purpose (other than solely for transport on land), from the owner or operator of a vessel issued a valid permit under this part, any species of fish, the harvest of which is managed by this part, unless otherwise exempted in this part.

Section 648.2 Processing, or to process, with respect to the Atlantic herring fishery, means the preparation of Atlantic herring to render it suitable for human consumption, bait, commercial uses, industrial uses, or long-term storage, including but not limited to cooking, canning, roe extraction, smoking, salting, drying, freezing, or rendering into meat or oil.

Section 648.2 Transfer means to begin to remove, to remove, to pass over the rail, or to otherwise take away fish from any vessel and move them to another vessel.

Possible Modifications/Additions/Clarifications to Consider

Option 1: *The Council may establish a regulatory definition of "transfer at sea" for the purposes of the Atlantic herring fishery to clarify provisions related to each vessel engaged in the operation.*

PROPOSED DEFINITION TBD

Option: *The Council may want to consider revising some of the existing regulatory definitions to clarify which vessels are authorized to engage in certain herring-related activities and what reporting requirements may apply to these vessels.*

TBD

Option: *The Council may want to consider establishing a new herring carrier/dealer permit that would be required for carrier vessels that sell Atlantic herring to any entity.*

- This option would require the addition of a regulatory definition of “Atlantic herring carrier/dealer” in Section 648.2 (Definitions).
- The permit would require compliance with federal dealer reporting requirements at any time the vessel is in possession of a (new) carrier/dealer LOA. A “dealer identifier” would have to be developed for carrier/dealers for the purposes of reporting.
- This measure would also require the establishment of two LOAs for carrier vessels: one for vessels that only transport fish, and one for vessels that transport and sell fish.

TBD

3.3.1.2 Modifications to the Interactive Voice Response (IVR) Reporting Requirements

Currently, vessels participating in the Atlantic herring fishery are required to call-in and report their herring catch on a weekly basis through the Interactive Voice Response (IVR) system. The IVR system is an automated, phone-based reporting method initially created for multispecies dealer reporting. It was later modified to include Atlantic herring catch reports in response to the need for real-time quota monitoring. The regulations specify that the owner or operator of any vessel issued a limited access Atlantic herring permit must submit an Atlantic herring catch report via the IVR system each week, regardless of how much herring is caught (including weeks when no herring is caught), unless exempted from this requirement by the Regional Administrator. In addition, the owner or operator of any vessel issued an open access permit for Atlantic herring that catches 2,000 pounds of Atlantic herring on any trip in a week must submit an Atlantic herring catch report via the IVR system for that week as required by the Regional Administrator.

The main reason for utilizing the IVR system in the Atlantic herring fishery is to monitor the Total Allowable Catch (TAC) limits set for the four herring management areas. As part of the Atlantic herring fishery specification process, each management area is annually assigned a TAC (in metric tons). Although vessels are also required to report catches with vessel trip report (VTR) forms, near real-time data is obtained through the IVR system allowing the TACs to be monitored. When the catch in a management area is projected to reach 95% of its specified TAC (or 92% in areas with research set-asides), the Regional Administrator enacts a closure for all

directed herring fishing, and all vessels are restricted to a herring possession limit of 2,000 pounds to accommodate incidental catch.

The IVR system currently requires vessel owners/operators to submit herring catch reports through the IVR system even during weeks when the vessel may not have fished and/or may not have caught any herring. These are considered “negative reports,” i.e., reports of zero catch. NMFS supports the continuation of negative IVR reporting in the herring fishery and has indicated that other fisheries are moving towards implementing this requirement where applicable. Negative IVR reports ensure that catch/landings data are more complete and affirm an action relative to vessels’ fishing activity during any given week. Negative reports help to resolve potential problems with “missing” data; for example, if a vessel has been submitting herring catch reports through the IVR system and does not fish or catch herring for several weeks, the negative reports allow database managers to know that the vessel did not fish or catch herring during those weeks, versus making assumptions about the vessel’s fishing activity and/or applying a proxy level of catch for the vessel’s missing reports. Data gaps must be addressed in a timely fashion in order to use the IVR system for real-time quota monitoring, so if negative reports are not filed, it is less clear whether the available data accurately characterize catch in the fishery for quota monitoring purposes.

During the scoping process and ongoing discussions regarding the development of Amendment 4, several possible modifications to the herring IVR reporting system have been proposed for further consideration. The intent of these measures would be to improve reporting compliance and the accuracy and timeliness of quota monitoring information.

In this amendment, it will be important to clarify and ensure, to the extent possible, that all catch is required to be reported through both IVRs and VTRs. Management area TACs represent total allowable catch, which includes landings and discards. Monitoring the TACs in a timely and effective manner will require improved reporting and documentation of bycatch/discards in the fishery. Observer reports, confirmed by industry members, indicate that herring vessels (trawlers and purse seiners) sometimes release hauls for various reasons (too many fish to pump to vessel; fish too small, bycatch, etc). The amount of fish released should be reported as discard through the IVR and counted toward TAC monitoring, in addition to being reported on VTRs. Efforts should be made in this amendment to improve IVR and VTR reporting of discards in the Atlantic herring fishery.

Current regulations for VTR reporting in **Section 648.7** require vessels to submit the following information on VTRs: Vessel name; USCG 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; haul weight, in pounds (or count of individual fish, if a party or charter vessel), by species, of all species, or parts of species, such as monkfish livers, **landed or discarded**; and, in the case of skate discards, “small” (i.e., less than 23 inches (58.42 cm), total length) or “large” (i.e., 23 inches (58.42 cm) or greater, total length) skates; dealer permit number; dealer name; date sold, port and state landed; and vessel operator’s name, signature, and operator’s permit number (if applicable).

Current regulations for IVR reporting in **Section 648.7** state the following for IVR reporting: The owner or operator of a vessel issued a permit to fish for Atlantic herring must report catches (retained and discarded) of herring each week to an IVR system, as specified in paragraphs (b)(2)(i)(A) and (B) of this section. The report shall include at least the following information, and any other information required by the Regional Administrator: Vessel identification, week in which species are caught, **pounds retained, pounds discarded**, management areas fished, and pounds of herring caught in each management area for the week. The IVR reporting week begins on Sunday at 0001 hrs (12:01 AM) local time and ends Saturday at 2400 hrs (12 midnight). Weekly Atlantic herring catch reports must be submitted via the IVR system by midnight, Eastern Time, each Tuesday for the previous week. Reports are required even if herring caught during the week has not yet been landed.

3.3.1.2.1 IVR Alternative 1: No Action

Under this alternative, provisions and requirements for IVR reporting would remain unchanged.

XXX

3.3.1.2.2 IVR Alternative 2: Trip-by-Trip IVR Reporting

Limited Access Permit Holders (Categories A, B, C)

- All limited access permit holders (Category A, B, and C) would be required to submit an Atlantic herring catch report via the IVR system on a trip-by-trip basis.
- Negative reports would continue to be submitted on a weekly basis (status quo).
- **Option:** Limited access permit holders also would be required to report their first page VTR serial number for the trip; this will establish a mechanism to more accurately match/link trips between the IVR, VTR, and dealer databases.
- Offloading to herring carrier/dealer vessels would be considered the same as offloading to a shoreside dealer for the purposes of IVR reporting.

Open Access Permit Holders (Category D)

Open Access Option 1

- Open access permit holders would be required to submit an Atlantic herring catch report via the IVR system on a trip-by-trip basis for any trips on which herring is caught (landed or discarded).
- Negative IVR reports would not be required for open access permit holders.
- **Option:** Open access permit holders also would be required to report their first page VTR serial number for the trip; this will establish a mechanism to more accurately match/link trips between the IVR, VTR, and dealer databases.
- Offloading to herring carrier/dealer vessels would be considered the same as offloading to a shoreside dealer for the purposes of IVR reporting.

Open Access Option 2

- Open access permit holders that possess a Letter of Authorization (LOA) to transfer Atlantic herring at sea would be required to submit an Atlantic herring catch report via the IVR system on a trip-by-trip basis for any trips on which herring is caught (landed or discarded). These permit holders also would be required to report their first page VTR serial number for the trip; this will establish a mechanism to more accurately match/link trips between the IVR, VTR, and dealer databases.
- Negative IVR reports (weekly) would be required for open access permit holders that possess a LOA to transfer Atlantic herring at sea. The current LOA would be revised to include this requirement.
- Open access permit holders that do not receive a LOA to transfer Atlantic herring at sea would continue to be subject to current (status quo) IVR reporting requirements (weekly reporting for vessels that catch 2,000 pounds of Atlantic herring on any trip in a week, negative reports not required).
- Offloading to herring carrier vessels would be considered the same as offloading to a shoreside dealer for the purposes of IVR reporting.

3.3.1.2.3 Additional IVR Options and Outstanding Issues

IVR Reporting Deadlines – Trip-Level

1. **Option 1** – For permit holders that would be subject to a requirement to report catch via the IVR system on a trip-by-trip basis, the deadline for reporting would be within **24 hours** of offloading or prior to starting the next fishing trip, whichever is less. This option is based on the current provisions for IVR reporting in the Tilefish FMP:
(ii) Tilefish vessel owners or operators. The owner or operator of any vessel issued a limited access permit for tilefish must submit a tilefish catch report via the IVR system within 24 hours after returning to port and offloading as required by the Regional Administrator...
2. **Option 2** – For permit holders that would be subject to a requirement to report catch via the IVR system on a trip-by-trip basis, the deadline for reporting would be within **6 hours** of offloading or prior to starting the next fishing trip, whichever is less.

IVR Weekly Reporting Deadlines

1. **Option 1 – Status Quo (No Action)** – For permit holders that would be subject to a requirement to report catch via the IVR system on a weekly basis (proposed in the alternative described above for open access permit holders and negative reports for limited access permit holders), the current reporting deadline would apply. The IVR reporting week begins on Sunday at 0001 hrs (12:01 AM) local time and ends Saturday at 2400 hrs (12 midnight). Weekly Atlantic herring catch reports must be submitted via the IVR system by midnight, Eastern Time, each Tuesday for the previous week.

2. **Option 2**– IVR reporting deadlines could be changed from Tuesday midnight (current) to Monday midnight – this would provide better lead time for projections and management area closures. For permit holders that would be subject to a requirement to report catch via the IVR system on a weekly basis (proposed in the alternative described above for open access permit holders and negative reports for limited access permit holders), weekly Atlantic herring catch reports and negative reports must be submitted via the IVR system by midnight, Eastern Time, each Monday for the previous week.

3.3.1.3 Outreach Programs to Improve Compliance and Consistency

The Council is considering requirements for NMFS to conduct outreach programs to enhance the industry’s understanding of all regulations pertaining to the reporting of herring catch and the catch monitoring program that may be established in this amendment.

Outreach Program to Ensure Consistency in Reporting and Improve Compliance

The Council may require and work with NMFS to structure an outreach program for improving reporting compliance by vessels and dealers once Amendment 4 is implemented. The Atlantic herring fishery is discrete enough that NMFS could work with the majority of participants in the fishery to standardize and clarify reporting requirements and better ensure that landings/catch data are provided to NMFS in a consistent and complete format.

Outreach Program to Foster Cooperation with Observers/Sea Samplers

XXX

3.3.1.4 Measures to Address VTR Reporting and VMS Provisions

Option: *Require vessel trip reports (VTRs) to be submitted on a weekly basis (versus the current monthly requirement)*

This measure could facilitate timely cross-checking between VTRs and weekly dealer reports. NMFS made this suggestion during the development of Amendment 16 to the Multispecies (Groundfish) FMP, although the status of this measure with respect to Amendment 16 is unclear at this time.

Option: *Eliminate the VMS “power down” provision for limited access herring vessels;*

This measure would prohibit limited access herring vessels from turning off their VMS units when in port unless specifically authorized by NMFS through a Letter of Exemption, consistent with VMS provisions for the multispecies, scallop, and surf clam/ocean quahog fleet:

- The Northeast Fisheries Regulations allow vessels holding certain permits to turn off their VMS units during periods when the vessel will be out of the water or during extended periods of no fishing activity. The request must be made in advance of the intended exemption period, and a “Letter of Exemption” must be issued by NMFS. Vessels may not turn VMS units off until they receive a LOE approval from NMFS.

- **All Vessels.** May request a Letter of Exemption from NMFS if the vessel is expected to be out of the water for more than 72 consecutive hours.
- **Limited Access Multispecies, Limited Access Scallop and Surfclam/Ocean Quahog Vessels (Proposed to Add Limited Access Herring Vessels).** May sign out of the VMS program for a minimum of 30 consecutive days by obtaining a Letter of Exemption from NMFS. The vessel may not engage in ANY fisheries until the VMS unit is turned back on.

NMFS Office of Law Enforcement (OLE) strongly supports this measure to enhance the enforceability of TAC monitoring and other related regulations for the Atlantic herring fishery.

3.3.1.5 Increase Coordination with States

The Council will work with ASMFC to improve reporting by State-permitted herring vessels. This may include requiring fixed gear fishermen to report herring catch through the IVR system, which is something the Council recommended in Amendment 1 to the Herring FMP.

ASMFC staff has indicated that ME DMR is in the process of generating a list of State-permitted fixed gear fishermen to coordinate reporting with NMFS. NMFS has agreed to assign a “dummy number” for each of these fishermen to use when they call-in to report their herring catch, since vessels (not fishermen) are usually assigned numbers to use for reporting through the IVR system. This process is ongoing, and ME DMR hopes to have the list complete before the end of this fishing year so that IVR reporting for fixed gear fishermen can commence during the 2009 fishing year.

XXX

3.3.2 Measures to Address Transfers at Sea

NMFS has indicated that the current provisions and allowances for transfers of herring at sea are problematic and may be one of the most challenging problems when trying to resolve differences between databases and/or ensure completeness of Atlantic herring catch/landings data.

The Letters of Authorization (LOAs) issued by NMFS for the Atlantic herring fishery currently allow an unlimited amount of herring (or the amount allowed by the vessels’ herring permit) to be transferred at-sea (a) from herring catcher vessels to carriers; (b) between federally-permitted herring vessels; and (c) from herring catcher vessels to non-permitted vessels for personal use as bait (see example LOAs distributed at July 30, 2008 Meeting). As a result, many transfers of herring at-sea may not be captured in both of the databases (IVR and dealer) used for in-season monitoring of catch and landings, which can lead to incomplete catch data and inconsistencies between datasets.

VTR records indicate that 933,862 pounds of herring were reported as “sold for bait” by vessels, presumably as transfers at sea. To date, during the 2008 fishing year, **25** unique vessels have been issued a Letter of Authorization to transfer Atlantic herring at-sea. VTR records for the 2008 fishing year are incomplete, and since most activity occurs during summer/fall, only 76,625 pounds have been reported as “sold for bait” in 2008 to date. Of the reported bait transactions

during 2007 and 2008 to date, only 24 were for 10,000 pounds or more. The largest transaction reported was for 20,000 pounds. However, it is unclear what percentage of the total transfers at sea and/or bait transactions between vessels these numbers may represent because this activity may be under-documented due to the current reporting system and allowance of at-sea transfers to occur in this fishery without restriction on the amount or nature of the transfer. NMFS suspects that transfer at-sea activity may be substantially higher than the current data indicate; addressing this issue could help to resolve some discrepancies between databases and provide for more complete and accurate records of the activity occurring in this fishery.

In Amendment 4, the Council is considering measures to minimize transfers at sea and/or standardize reporting requirements for vessels transferring/receiving herring. Management measures currently under consideration to address transfers of herring at sea are described in the following subsections (work in progress, subject to further modification/revision).

3.3.2.1 Option 1: Restrict Transfers At-Sea to Only Vessels with Category A or B Limited Access Permits

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

- Transferring and receiving vessels would be required to possess a limited access Category A or B permit for the herring fishery.
 - Herring carrier vessels operating under a Carrier LOA would be exempt from this requirement.
- + This measure limits at-sea transfers to the limited access directed fishery permit holders only. These are the vessels that do not operate under a possession limit for herring, improving at-sea enforceability.

3.3.2.2 Option 2: Prohibit Transfers At-Sea to Non-Permitted Vessels

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

- Transferring and receiving vessels would be required to possess a Category A, B, C, or D permit for the herring fishery. The Category D permit is an open access permit, so any vessel can obtain this permit, but possession of this permit subjects the vessel to VTR and other reporting requirements.
- + This measure may improve reporting compliance. Requiring a federal permit of some sort by all vessels engaged in the transfer activity reduces the likelihood that some herring catch, even in small amounts, will not be documented.

3.3.2.3 Option 3: Modify Provisions for Transfers At-Sea Based on Provisions for Transferring Small Mesh Multispecies

Under this option, vessels may transfer Atlantic herring at-sea from one vessel to another, for use as bait, **up to XXX pounds (500? 1,000? Other?), per trip**, provided:

- The transferring vessel possesses a limited access permit for Atlantic herring (Category A, B, or C);
- The transferring vessel has a LOA issued by the Regional Administrator on board; and
- The receiving vessel possesses a written receipt for any herring purchased at sea
 - **Option:** additional requirement for the receiving vessel to possess a Federal herring permit?
 - **Option:** additional requirement for receiving vessel to submit copies of bait receipts from at-sea purchases?
- Herring carrier vessels operating under a Carrier LOA would be exempt from this requirement.

3.3.2.4 Other Possible Options? (TBD)

- *Establish a Letter of Authorization for At-sea Bait Buyers that includes some reporting requirements (possibly less burdensome) and a requirement for written receipts;*
- *Restricting transfers of herring at sea for use as bait (by restricting the permit holders that are allowed to engage in the activity and/or the amount of fish allowed to be transferred);*
- *Requiring a VMS or IVR report every time a transfer at sea occurs;*
- *Require vessels that engage in transfers at sea to submit a “transfer at sea logbook.”*

3.3.3 Measures to Eliminate Reporting Redundancies

Duplicative/redundant reporting requirements is an issue that was identified by the herring industry during the scoping process for this amendment. Participants in the herring fishery are currently required to declare a herring trip via the Vessel Monitoring System (VMS), call-in to request an observer prior to leaving port, provide a pre-landing notification through VMS, call-in herring catch through the IVR reporting system, and submit vessel trip reports (VTRs, logbooks) and electronic dealer reports. While developing a comprehensive catch monitoring program in this amendment, there may be opportunities to streamline some of the reporting requirements and consequently reduce the burden on the industry as well as compliance, monitoring, and enforcement costs.

3.3.3.1 Options to Modify Declarations In/Out of Fishery

Efforts should be made to clarify declarations in/out of the Atlantic herring fishery and call-in/reporting requirements in such a way that vessels directing on herring and/or mackerel (and/or whiting) are reporting in the same manner. The existing DOF (or Declare Out of Fishery) declaration is used whenever the vessel's activity will be any activity other than: (1) a limited access scallop trip, (2) a multispecies or monkfish DAS trip, (3) a general category scallop trip, (4) a herring trip or a (5) surfclam/ocean quahog trip. The DOF declaration is also the appropriate declaration for any vessel movement away from the dock/mooring when no fishing activity is intended.

Currently, some mackerel vessels declare out of the herring fishery when they are targeting mackerel so that they are not subject to the observer call-in requirement and the pre-landing notification. However, these vessels are prohibited from keeping herring they may catch incidentally while fishing for mackerel or other species if they are declared out of the fishery. This creates a complex situation where vessels are "changing fisheries" (and are consequently subject to different requirements) sometimes on a trip-by-trip basis, and this may increase bycatch on trips where herring is unexpectedly encountered, which can happen in what is sometimes a mixed fishery.

This problem could be confounded if/when the Atlantic mackerel fishery becomes a limited access fishery (with potentially different call-in and reporting requirements). In Amendment 4, the Council may consider:

- **Option? Establishing a second type of herring trip declaration for "Herring/Mackerel."** Vessels declaring a herring/mackerel trip would be subject to the same call-in and reporting requirements as herring vessels, but the observer program managers could utilize the information to more effectively deploy observers on the appropriate trips (depending on the goals of the observer program). This declaration would be appropriate for vessels that intend to target mackerel on a trip, but may encounter and retain herring.
- **Option? Modifying current regulations** to allow vessels to keep Atlantic herring they may catch incidentally while targeting other species when they are declared out of the fishery, as long as the catch is reported – As an example, vessels that declare out of the fishery would not call-in to request an observer before leaving port, but if they catch herring while fishing for mackerel or another species, they could land the herring, if the catch is reported and a pre-landing notification is given through VMS.

Note: This option is problematic because it would provide no incentive for vessels to declare into the fishery prior to leaving port. The declaration into the herring fishery includes a requirement to call and inform the observer program of the trip that is about to occur, providing an opportunity for an observer to be deployed. Eliminating the incentive for the observer call-in may decrease the ability of the program managers to effectively allocate observer sea days on the appropriate trips in the herring fishery.

- **Option? Seasonal declarations in/out of the fishery** – the Atlantic mackerel fishery is primarily a winter fishery (December – April), so there may be an opportunity to apply the requirements for declaring in/out of the herring fishery in a seasonal manner, to reduce complexity and burdens on vessels participating in the mackerel fishery.

3.3.3.2 Options to Modify Pre-Trip Call-in Requirements

The call-in requirement for vessels to request an observer before leaving port was established in response to concerns about haddock bycatch and the establishment of the haddock catch cap in the herring fishery (Framework 40B to the Multispecies FMP). Although developed for a very specific purpose, this requirement has been helpful to the observer program to determine the schedule of observer coverage and know better where and when herring trips will occur. It also helps NMFS to estimate and target specific levels of coverage in the fishery during the fishing year.

If the call-in program is set up in the most efficient manner, it can help to reduce operating costs for the observer program, as fishing trips are more predictable and less time is spent determining when/where observed trips should occur. However, there may be some modifications to the current program that would both improve efficiency and reduce the burden on the industry. If the burden can be reduced, then vessels may be less inclined to DOF to avoid the call-in requirement.

- I. A **more efficient system** to examine call-in compliance and evaluate enforcement's response to non-compliance could be explored by NMFS;
- II. **Additional options for notification** could be considered (fax, email, website);
- III. The **timing of the requirement could be changed** from at least 72 hours prior to something shorter (36 or 48 hours, for example);
- IV. **Option?:** Vessels could be required to supply "intended target species" information to assist the observer program managers in identifying trips where vessels may be targeting herring versus vessels targeting mackerel or other species that may encounter herring. This may assist in the allocation of available sea days for observers to be deployed in the herring fishery. (Also see suggested option for a "Herring/Mackerel Trip Declaration" above.)
- V. The call-in requirement could be incorporated into a more comprehensive monitoring/reporting system for the fishery.

3.3.4 Measures to Address At-Sea Monitoring

3.3.4.1 Background

One of the most important elements of an at-sea monitoring program, and one of the initial decisions that must be made, concerns the goals and objectives of the program – specifically:

- What are the observers going to measure? (catch/bycatch, species, gear types, etc.)
- What are the priorities?
- Should observer data be used to estimate bycatch of species *x* across the entire fishery or gear type? If so, what is the level of precision that should be achieved by using observer data to estimate bycatch?

Example Approach – Preliminary Analysis

A statistical approach to determining the appropriate level of observer coverage in a fishery would to (1) set a goal (usually based on precision and expressed as a *coefficient of variation*, CV) and then (2) use existing information to determine the level of coverage needed to achieve the goal. A CV is a normalized measure of dispersion of a probability distribution. The CV is generally defined as the ratio of the standard deviation to the mean.

As part of the development of the omnibus amendment to address standardized bycatch reporting methodology (SBRM), the National Working Group on Bycatch (NWGB) concluded that, “*for fishery resources, excluding protected species, caught as bycatch in a fishery, the recommended precision goal is a 20-30% CV for estimates of total discards (aggregated over all species) for the fishery; or if total catch can not be divided into discards and retained catch then the goal is a 20-30% CV for estimates of total catch.*” (NMFS 2004) As the NWGB pointed out, “Ideally, standards of precision would be based on the benefits and costs of increasing precision” (NMFS 2004). They also noted that under some circumstances, attaining the precision goal alone would not be an efficient use of the public resources. **The tradeoffs associated with increasing precision to meet a specified goal are very important to understand when developing an observer program.**

To begin to explore this issue relative to catch monitoring in Amendment 4, the Herring PDT provided a *example approach* to determining levels of observer coverage necessary to meet a specific goal. The following exercise was conducted by the Herring PDT using existing observer data for two years during which there was more observer coverage of these two gear types (2004 and 2005), combined with the methodology and formulas specified by the SBRM amendment to calculate variance and to estimate the number of trips necessary to achieve certain levels of precision.

Table 3 and Table 4 illustrate how the SBRM methodology can be used to develop a statistical approach to sampling the herring fishery to meet a specific goal – in this example, the goal is estimating river herring bycatch on midwater trawl and pair trawl vessels with a certain level of precision (as expressed by the CV). Observer records for midwater trawl and pair trawl vessels

during 2004 and 2005 were used to generate discard/kept ratios of river herring/total herring. These ratios were used in formulas specified by the SBRM amendment to first calculate variance, and then determine, based on available information, how many sea days/observer trips would be necessary to achieve that level of precision. This exercise highlights a few key points with respect to designing an observer program:

- There are costs associated with increasing precision of bycatch estimates resulting from observer data. The lower the CV, the higher the precision, and the more sea days/observer trips are required to achieve that level of precision.
- When discard/kept ratios are small (see 2004 single midwater trawl D/K ratio in Table 4, for example), observed bycatch events are rare, so capturing these events in the future will require more coverage. These tradeoffs must be thoroughly explored when designing an appropriate observer program and prioritizing available resources.
- The D/K ratios, and therefore the target number of sea days and percent coverage, will vary by species and by gear type. The example provided in Table 3 and Table 4 characterizes the statistical approach that can be taken to evaluate levels of coverage and identify priorities, but the specific formulas must be applied to each species and gear type individually when designing a program. Ultimately, a statistically-sound program should be developed based on both the top priorities for coverage and the resources that will be available to support it.

Table 3 Example Approach to Determining Appropriate Levels of Observer Coverage – Based on 2005 Bycatch Data for River Herring

PAIR TRAWL (2005) D/K = 0.031787			
Target Coefficient of Variation (CV)	Target No. Trips	Target No. Sea Days	Target % Coverage (of total trips)
10%	91.82	137.73	35.18
20%	31.18	46.77	11.95
30%	14.84	22.27	5.69
40%	8.56	12.84	3.28
50%	5.55	8.32	2.12
MIDWATER TRAWL (2005) D/K = 0.074375			
Target Coefficient of Variation (CV)	Target No. Trips	Target No. Sea Days	Target % Coverage (of total trips)
10%	159.00	238.51	30.52
20%	51.55	77.33	9.89
30%	24.24	36.37	4.65
40%	13.92	20.88	2.67
50%	9.00	13.49	1.73

Table 4 Example Approach to Determining Appropriate Levels of Observer Coverage – Based on 2004 Bycatch Data for River Herring

PAIR TRAWL (2004) D/K = 0.0343432			
Target Coefficient of Variation (CV)	Target No. Trips	Target No. Sea Days	Target % Coverage (of total trips)
10%	112.73	169.09	12.64
20%	31.13	46.70	3.49
30%	14.11	21.17	1.58
40%	7.99	11.99	0.90
50%	5.13	7.70	0.58
MIDWATER TRAWL (2004) D/K = 0.000016933			
Target Coefficient of Variation (CV)	Target No. Trips	Target No. Sea Days	Target % Coverage (of total trips)
10%	153.69	230.53	67.41
20%	77.71	116.56	34.08
30%	42.60	63.90	18.69
40%	26.10	39.15	11.45
50%	17.42	26.13	7.64

Follow-up – Establishing Priorities

At its October 7-9, 2008 meeting, the Council reviewed the preliminary analysis of observer coverage levels and the example approach provided by the Herring PDT (above) and passed the following motion:

To request that the herring PDT develop a range of alternatives for an at-sea monitoring program (onboard observer and electronic) with a CV of 20%, that focuses upon Atlantic herring, river herring species and haddock.

Rather than conduct an analysis based solely on achieving a 20% CV for these species, the PDT re-ran the example above for all three species over a range of desired CVs. This helps to better illustrate the trade-offs associated with the choices that would need to be made, based on goals and priorities for observer coverage as well as available resources. Table 5 and Table 6 summarize the results of this analysis for midwater trawl and pair trawl vessels respectively. The analysis is based on 2005 observer data because 2005 was the year with the most sea sampling (coverage, intensity) in recent years for these gear types. Observer coverage during the 2005 fishing year sampled close to 20% of the herring fishery.

This analysis is intended to give managers an understanding of the level of observer coverage that would likely be necessary to achieve the desired CV for estimating bycatch of herring, river herring, and haddock on midwater trawl and pair trawl vessels. The output (#trips) has been translated to observer sea days using an assumption of 1.5 days per trip. This should help in terms of designing a sampling program that can meet specific goals. Once goals are identified

and the number of required sea days is estimated, the next step would be to design a sampling schedule for the fishing year based on current patterns of fishing effort.

The results illustrate the costs that would be associated with covering the fishery to sample “rare” bycatch events adequately enough to estimate bycatch with a CV of 20%. Based on available data, bycatch (discards) of Atlantic herring appear to be somewhat rare in the fishery and would therefore require a very high level of coverage (over 300 sea days) in order to sample enough to estimate the total bycatch with a 20% CV. A similar result is seen for estimating haddock bycatch on pair trawl vessels. The observed discard/kept ratios are low, which means that a high level of sea days would be required to achieve a CV of 20%. Likewise, when a sea day is allocated for the purposes of estimating river herring bycatch, available information suggests that no river herring will be encountered about 75% of the time.

While this exercise helps to illustrate tradeoffs and identify priorities for sampling, it really only provides some background and context for managers to consider what level of coverage may be necessary to achieve certain goals. It serves as a guideline and supplements the information and analysis provided in the SBRM amendment. **(ADD MORE ABOUT SBRM AMENDMENT)**

Because this analysis serves as a guideline for decision-making with respect to at-sea monitoring, it is important to remember that the results are dependent on observed discard/kept (D/K) ratios and how the variance around those ratios is estimated. Variance most likely does not carry forward from year to year, especially if management measures affect effort and/or fishing patterns. Also, this approach does not consider the magnitude of mortality of the species in question. The biological impact of bycatch that is occurring in the herring fishery is an important factor to consider when identifying priorities for at-sea monitoring.

Table 5 Designing an Observer Program for Midwater Trawl Vessels– Based on 2005 Bycatch Data for River Herring, Haddock, and Atlantic Herring

Single Midwater Trawl (2005)			
River Herring			
CV	# trips	# sea days	% Coverage (trips)
0.1	159	239	31
0.2	52	77	10
0.3	24	36	5
0.4	14	21	3
0.5	9	13	2
Haddock			
CV	# trips	# sea days	% Coverage (trips)
0.1	157	236	30
0.2	51	76	10
0.3	24	36	5
0.4	14	21	3
0.5	9	13	2
Atlantic Herring			
CV	# trips	# sea days	% Coverage (trips)
0.1	384	575	74
0.2	214	321	41
0.3	123	185	24
0.4	77	116	15
0.5	52	79	10

Table 6 Designing an Observer Program for Pair Trawl Vessels– Based on 2005 Bycatch Data for River Herring, Haddock, and Atlantic Herring

Pair Trawl (2005)			
River Herring			
CV	# trips	# sea days	% Coverage (trips)
0.1	92	138	35
0.2	31	47	12
0.3	15	22	6
0.4	9	13	3
0.5	6	8	2
Haddock			
CV	# trips	# sea days	% Coverage (trips)
0.1	242	364	93
0.2	200	299	76
0.3	154	231	59
0.4	117	176	45
0.5	89	134	34
Atlantic Herring			
CV	# trips	# sea days	% Coverage (trips)
0.1	242	364	93
0.2	200	300	77
0.3	155	232	59
0.4	118	176	45
0.5	90	135	34

3.3.4.2 Options For Further Discussion/Development

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

1. Provide accommodations and food that are equivalent to those provided to the crew.
2. Allow the sea sampler/observer access to and use of the vessel's communications equipment and personnel upon request for the transmission and receipt of messages related to the sea sampler's/observer's duties.
3. Provide true vessel locations, by latitude and longitude 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.

Additional management measures are being considered in Amendment 4 to enhance regulations pertaining to the current at-sea monitoring program. This should improve the vessel owner/operator's understanding regarding expectations and the collection of information by observers during a fishing trip, and ensure safe working conditions for observers on all fishing vessels. The Herring PDT supports inclusion of the management measures to ensure observer safety in Amendment 4, but recognizes that some of the measures to ensure accurate and complete collection of catch data may be problematic from an enforcement or compliance perspective. However, further discussion of all possible management measures is warranted at this time. The Council's Enforcement Committee will review the proposed management measures and provide feedback in May 2009, and the Herring Advisory Panel may also be able to provide substantive feedback regarding some of these measures.

Moreover, the Council may want to consider requiring an outreach program and/or working with the fishing industry to develop a clear Code of Conduct for trips carrying a fisheries observer. This approach may be particularly helpful to address issues that cannot be resolved through regulatory change and to reach some sort of agreement regarding any of the measures below that are eliminated from consideration due to enforcement, compliance, and/or practicability problems.

I. MEASURES TO ENSURE OBSERVER SAFETY

A. Provide the observer with a safe sampling station – this may include a safety harness (if grating systems are high above the deck), a safe method to obtain basket samples, and a storage space for baskets and gear

- At the very least, vessels should be required to provide a 3'x3' sampling station and a dry area for the observer to stow his/her gear and sampling tools (length-frequency boards, etc.)

Regulations for the North Pacific's Groundfish Observer Program (Section 679.50) state that an operator of a fishing vessel must:

---Maintain safe conditions on the vessel for the protection of observers including adherence to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel;

---Have on Board: a valid Commercial Fishing Vessel Safety Decal issued within the past two years that certifies compliance with regulations found in 33 CFR Chapter I and 46 CFR Chapter I; a certificate of compliance issued pursuant to 46 CFR 28.710; or a valid certificate of inspection pursuant to 46 U.S.C. 3311.

B. *Provide assistance in obtaining basket samples and sorted discards*

Regulations for the North Pacific's Groundfish Observer Program (Section 679.50) state that an operator of a fishing vessel must:

---Provide all other reasonable assistance to enable observers to carry out their duties, including, but not limited to:

- Measuring decks, codends, and holding bins;
- Providing the observers with a safe work area adjacent to the sample collection site;
- Collecting bycatch when requested by the observers;
- Collecting and carrying baskets of fish when requested by the observers;
- Allowing observers to determine the sex of fish when this procedure will not decrease the value of a significant portion of the catch; and
- Collecting all seabirds that are incidentally taken on the observer-sampled portion of hauls using hook-and-line gear or as requested by an observer during non-sampled portions of hauls.

II. MEASURES TO ENSURE THE ACCURATE AND COMPLETE COLLECTION OF CATCH DATA

A. *Requirement to bring closed codend on board whenever possible and open it onboard for the observer to inspect*

- The PDT recognizes that this requirement may be problematic for participants in the Atlantic herring fishery. Some questions to consider include: is this practical from all vessels' perspective? What is the impact on high-volume fisheries – interruption of operations because of requirements to sort on deck? Possible to do this on some vessels and not others? Size limitations for sorting on deck? What are the concerns with respect to vessel safety, and can they be addressed?

B. *Requirement to provide accurate details to the observer regarding why a bag may be partially pumped and fish released*

- Vessel operators could be required to provide information about whether a bag was partially/fully slipped, the reason for the slippage, and the estimated weight of fish that were released.

C. *Provide observer notice when pumping may be coming to an end*

Regulations for the North Pacific's Groundfish Observer Program (Section 679.50) state that an operator of a fishing vessel must:

---Notify observers at least 15 minutes before fish are brought on board, or fish or fish products are transferred from the vessel, to allow sampling the catch or observing the transfer, unless the observers specifically request not to be notified.

D. Notify the observer of any known marine mammal in the net**E. Requirement to use two observers on larger vessels and/or pair trawl operations**

- Doubles the cost of observer coverage/decreases available sea days to cover the fishery by 50%
- Helps to ensure that all bycatch will be accounted for, if this is a high priority for at-sea sampling; allows for sampling the entire catch in a situation where one observer may not be able to do so

F. In pair trawl operations, require additional communication between the boats if fish are being pumped to both vessels with only one observer**G. Require a flow scale on a processing vessel since there is no other method to estimate volume of catch**

- No at-sea processors engaged in the herring fishery at this time; potential for future at-sea processing vessels in the fishery may not be significant
- Costs must be considered.

3.4 CATCH MONITORING – NO ACTION ALTERNATIVE**DESCRIBE NO ACTION ALTERNATIVE**

The following outline characterizes the current program for monitoring the management area TACs in the Atlantic herring fishery. It represents the status quo with respect to quota monitoring and reporting and ultimately will be incorporated into the “no action alternative” for this amendment. NMFS Regional Office staff presented this outline to the Herring Committee as a starting point for discussion when considering measures to improve catch monitoring in this amendment. It is important to understand the current monitoring/reporting structure in order to identify strengths, weaknesses, and areas that require improvement.

Data Sources**Primary:**

- IVR reports from vessels – one report/week for limited access permit holders (including negative reports when no herring caught) and for open access permit holders that catch 2,000 lb or more on any trip in a week

Supplemented by:

- Dealer landing reports from SAFIS (dealer reporting system)
- Using VMS to attribute dealer landings to herring management area based on time spent in area by vessel on herring trips

Quality Control and Compliance

- IVR Database Quality Control and Compliance – FSO does compliance, corrections, and makes contact with vessels

- Weekly compliance report checking for duplicate reports, reviewing multiple trips per week, correcting negative entries, missing IVR reports, reviewing required permits to land, etc.
- SAFIS Dealer Database Quality Control and Compliance
 - FSO checks dealers landings against required permits, IVRs and VTRs from vessels checked against dealer reports
 - Atlantic Coastal Cooperative Statistics Program (ACCSP), FSO, and Northeast Fisheries Science Center (NEFSC) perform multiple levels of audits on all dealer-reported data and investigate issues as necessary.
- Ad hoc checks of trip declarations, trip limits, area fished, observer call-in, etc.
- Potential violations are sent to the Office of Law Enforcement

Area Fishery Monitoring

- FSO reviews multiple data sources to monitor the area herring TACs, including VMS, declared herring trips, observer program call-ins, herring pre-landing reports, port agent comments, IVR catch reports, and SAFIS dealer landing reports.
- FSO publishes a weekly herring monitoring report to the NERO website (http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm), which displays how much of the herring TACs has been caught based on preliminary data. This report is generated by:
 - Tabulating IVR reports of herring landings and discards
 - Supplementing with additional dealer landings for vessels where total dealer landings are greater than total IVR landings
 - Attributing these dealer landings to fishery management area based on
 - IVR, if available, if not then,
 - VMS - where vessel spent the most time - if available, if not then,
 - The fleet's activity for the week

Other Monitoring

- **Border Transfer (BT)** (TAC = 4,000 mt)
 - U.S. catcher vessels only; vessels report weekly through IVR
 - Foreign carrier vessels do not report
 - Foreign dealers report through SAFIS same as U.S. dealers do, entering the foreign country as the state and the U.S. catcher vessel permit number
 - BT landings are identified by selecting the foreign country as landing state in SAFIS
 - FSO identifies the corresponding IVR landings and includes these landings from area fishery landings for the purposes of quota monitoring
 - BT landings are not posted separately because of confidentiality restrictions, but are tracked separately by FSO and counted against the management area TACs

- FSO will report these on the weekly herring monitoring report on NERO website (http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm)
- **Maine Weir Fishery** (500 mt set-aside from Area 1A TAC)
 - Inshore, state fishery managed by Maine
 - Vessels will report weekly through IVR, as directed by Maine managers and using an identifying code
 - Dealers report through SAFIS
 - Maine weir landings will be identified by selecting the identifying code in IVR
- **Research Set-Aside (RSA)** (TAC = 3% from each management area TAC)
 - Vessels apply through NMFS Sustainable Fisheries Division
 - Vessels will report weekly through IVR using an identifying code for RSA
 - FSO will select these and corresponding dealer landings and exclude from the management area fishery TAC
 - FSO will report these on the weekly herring monitoring report on NERO website (http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm)
- **U.S. At-Sea Processing (USAP)** (TAC = 20,000 mt from Areas 2 and 3 only)
 - Processing vessels must be permitted as herring dealers
 - Catcher vessels report weekly through IVR
 - Processing vessels report through SAFIS as other dealers, entering “Domestic JD 970999” as the port code.
 - USAP landings are identified by selecting “Domestic JD 970999” port as landing port in SAFIS
 - FSO identifies the corresponding IVR landings and excludes these landings from area fishery landings
 - FSO will report these on the weekly herring monitoring report on NERO website (http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm)
- **Area 2 New York Inshore Herring Landings**
 - Non-federally permitted vessels land herring in NY and are not required to report through IVR
 - Federally permitted dealers report these herring through SAFIS as usual; herring management area is unknown
 - FSO identifies NY landings without federal permit numbers in SAFIS and attributes them to the Area 2 TAC
- **Total Allowable Level of Foreign Fishing** (TAC = 0 mt)
 - No fishing allowed
 - Not currently monitored by FSO

3.5 CATCH MONITORING ALTERNATIVE 1

This alternative was first discussed at the December 16, 2008 Herring Committee meeting. This alternative includes all of the management measures/options described in the following subsections.

3.5.1 Measures to Ensure Maximized Retention

This alternative will include management measures designed to ensure *maximized retention* of catch on all herring vessels, to the extent possible. Options under consideration for maximized retention under this alternative are described below.

- Measures for maximized retention based on CHOIR/Herring Alliance suggestions (while addressing industry concerns about the benefits of test tows, presorting issues (dogfish, for example), safety issues, etc.)

3.5.2 Measures to Standardize/Certify Volumetric Measurements for Herring Catch

This alternative will include management measures that require standardization and/or certification of volumetric measurements used to estimate herring catch. The options under consideration are described below.

- Measures for certified weighing/volumetric measurements standardized for the herring fishery (included in several proposals)

3.5.3 Measures to Establish a Port Sampling Set-Aside (PSSA)

Under this alternative, the Council, in consultation with the ASMFC, would set-aside up to **X%** (**3%? 5%?**) of the TAC from any management area(s) or the total TAC for the herring fishery to support portside monitoring and commercial catch sampling of herring landings. The Council would determine the specific percentages for the portside sampling set-aside (PSSA) and the management area(s) to which they apply during the fishery specification process.

- Measures to eliminate the research set-aside and instead establish a portside sampling set-aside (3%) to significantly increase sampling (based on ME DMR portside sampling program including specific protocols/standards, requirements for follow-up analysis re. relationship between portside and at-sea monitoring data, and possible extrapolation to the entire fishery)
- Identify/propose standards/protocols for port sampling, any additional requirements, describe process for allocating funds and who would be responsible (ME DMR/MA DMF) – add them to this section as part of the proposed action

3.5.3.1 PSSA Option 1 – Eliminate the Research Set-Aside and Replace it with a PSSA

Under this option, the current research set-aside (RSA) for the herring fishery would be eliminated, and a PSSA would be established.

Currently, the herring fishery closes in a particular management area when it is projected that 92% of the area TAC has been/will be caught. Five percent of the remaining TAC is set-aside for incidental catch in other fisheries (under a 2,000-pound trip limit) after the directed fishery is closed, and 3% is currently set-aside to support herring-related cooperative research. Similar to the RSA, the portside sampling set-aside is intended to be in addition to the current 5% set-aside for incidental catch once the directed fishery in a management area closes. Under this option, the RSA would be eliminated, and the herring fishery would close in a management area when it is projected that X% of the TAC is reached (100% minus the 5% incidental catch set-aside and the X% PSSA).

3.5.3.2 PSSA Option 2 – Establish PSSA in Addition to the RSA

Under this option, the current research set-aside (RSA) for the herring fishery would continue, and a PSSA would be established in addition to the RSA.

Currently, the herring fishery closes in a particular management area when it is projected that 92% of the area TAC has been/will be caught. Five percent of the remaining TAC is set-aside for incidental catch in other fisheries (under a 2,000-pound trip limit) after the directed fishery is closed, and 3% is currently set-aside to support herring-related cooperative research. Under this option, the herring fishery would close in a management area when it is projected that X% of the TAC is reached (100% minus the 5% incidental catch set-aside, the 3% RSA, and the X% PSSA).

3.5.4 Measures to Require Electronic Reporting

Under this alternative, electronic reporting would be required for Category A and B limited access herring vessels.

- Electronic reporting for limited access vessels (based on study fleet program with possible additions/modifications, including Frulla et al suggestions to utilize technologies to identify bycatch areas and slippage events)
- Council staff to meet with NEFSC staff in March/April 2009 to discuss study fleet work and potential applications in the herring fishery; anticipated presentation/discussion at March or April 2009 Herring Committee meeting

3.5.5 Measures to Improve Quota Monitoring, Modify IVR Requirements, and Address Transfers At-Sea (from Section 3.2)

This alternative will incorporate some of the measures proposed in this document to improve quota monitoring (Section 3.3.1, p. 36), modify IVR Reporting requirements (Section 3.3.1.2, p. 39), and measures to address transfers at-sea (Section 3.3.2, p. 44).

XXX

3.5.6 Measures to Address At-Sea Monitoring

At-sea monitoring in this alternative will be based on a sampling design that is intended to achieve a 20% CV for estimating bycatch of Atlantic herring, river herring, and haddock in the herring fishery. Based on available resources, observer days will be allocated to the herring fishery based on the sampling design that is ultimately adopted in this amendment (see Section 3.3.4.1 of this document for a detailed description of the sampling design – still under development, final details TBD). This amendment encourages and requires the maximum amount of observer coverage that available resources can support, within the bounds of the sampling program described in Section 3.3.4.1.

- Management measures to address at-sea monitoring are described in Section 3.3.4.2 of this document. The measures that are ultimately adopted by the Council to address/improve at-sea monitoring will be incorporated into this alternative.

3.5.7 Video Monitoring Pilot Program

This alternative will establish a pilot program to collect information and determine the most appropriate applications for video monitoring in the Atlantic herring fishery.

- Details TBD; reference information provided by CHOIR, Archipelago
- Incentives to participate? Cost recovery?

3.6 CATCH MONITORING ALTERNATIVE 2

This alternative was approved by the Committee and Council for further consideration/development at the January and February 2009 meetings. This alternative includes all of the management measures/options described in the following subsections.

3.6.1 Measures to Improve Catch Weighing

The intent of these measures is to move towards as close to 100% catch weighing as practicable. Proposed measures include:

- Volumetric catch weighing program with a provision for alternative catch weighing plans to be developed and submitted by herring fishermen for approval by NMFS – calibration of fish holds by recognized certification agencies (American Bureau of Shipping, etc.) so that tanks can be measured by captain and crew to determine the amount of fish in the hold
- Captain and crew work with observers and shoreside samplers to confirm volume and weight of fish whenever possible, and VTRs cross-checked with dealer reports for accuracy when not possible
- To estimate total catch for monitoring TACs/ACLs, NMFS would develop a protocol for estimating weight and species composition of slipped catch (measures to improve observer program and utilization of new technologies, described below, can help to improve accuracy of data regarding slipped tows)

3.6.2 Measures to Encourage Utilization of New Technology to Improve Information Collection

- Top priority for the current RSA to investigate the feasibility of using the Study Fleet technology in the Atlantic herring fishery – electronic monitors, net sensors measuring trawl depth, temperature, and other data, and GPS integrated into a vessel's major systems to collect information and transmit electronically – technology can be used to measure incidences of slipped hauls on unobserved trips and provide fine-scale effort data

Discussion

The amount and quality of the information collected can help managers and the industry to better assess conditions that may lead to higher levels of bycatch, thereby improving the ability of fishermen to avoid it. Ultimately, this technology may also prove to be a much more cost-effective means of monitoring the fishery than either additional at-sea observers or video monitors. This technology can also provide a tool for better enforcement.

3.6.3 Measures to Achieve at Least 20% CV for Bycatch Estimates in the Fishery from a Combination of At-Sea and Shoreside Sampling

The intent of this alternative is to achieve a level of accuracy that reflects at least a 20% coefficient of variation (CV), for estimates of bycatch in the herring fishery from a combination of at-sea and shoreside sampling. Given the volume of fish caught by midwater trawl vessels, there are no opportunities for sorting fish at sea. Fish are pumped directly from the net to the holds below the deck. Other than larger species that are excluded by grates, samples taken portside and those taken at-sea should yield identical results. High levels of precision for species of concern, like river herring and haddock, can therefore be obtained through a combination of at-sea and shore-based sampling. (Improving estimates for bycatch that is not brought on board is addressed through measures to improve at-sea monitoring in Section 3.6.4).

3.6.3.1 Portside Sampling Program

This measure would require NMFS, in cooperation with the States of Maine and Massachusetts, to establish a uniform and statistically-robust shore-based catch sampling protocol, including standard reporting forms, criteria for sampling (number of samples, methodology, etc), standards for species identification training, etc.. This will ensure that all information collected is comparable and rigorous, regardless of whom it is collected by (State, Federal, or other samplers).

This measure also would mandate the establishment of a shore-based sampling program – direct NMFS to use some existing resources to collect catch/bycatch information at the first point of landing or production, subject to the normal operation of the fishing company.

Discussion

NMFS, the States, and the herring industry should work jointly to establish the most effective and efficient means for gathering samples, develop a uniform methodology for collecting such samples, and establish provisions for working space that do not interfere with offload and processing operations, in addition to other operational details. The current call-in system would be used to provide ample notice to NMFS prior to landing, in order to arrange for port samplers when they may be available.

3.6.3.2 Increase Observer Coverage to SBRM Levels

This measure would require NMFS to increase observer coverage in the Atlantic herring fishery to levels required by the Standardized Bycatch Reporting Methodology (SBRM) amendment.

Discussion

The Council should insure that the full measure of observer coverage necessary to meet the standards in the SBRM is achieved. However, even if the provisions for at-sea monitoring target a 30% coefficient of variation (CV) for bycatch estimates, the Council could achieve higher levels of precision by utilizing an expanded shore-based sampling program, as proposed (see above).

3.6.4 Measures to Improve At-Sea Monitoring

Some of the measures to improve at-sea monitoring, data collection, and observer safety that are proposed Section 3.3.4 of this document would be incorporated into this alternative, including:

- Provide the observer with a safe sampling station – this may include a safety harness (if grating systems are high above the deck), a safe method to obtain basket samples, and a storage space for baskets and gear
- Provide assistance in obtaining basket samples and sorting discards, with utilization of diverter shoots or some other method (to the extent practicable)
- Provide accurate details to the observer regarding why a bag may be partially pumped and fish released (also joint effort by observers and crew to estimate weight and composition of released tows). Whenever possible releasing fish should be with the intention of returning them to the sea alive. Observer logs would be updated to accommodate this information with an opportunity for Captains to record their remarks.
- Provide observer notice when pumping may be coming to an end to assist in allowing a consistent stratification of basket samples
- Captains and crew to notify the observer when there is a marine mammal entanglement so that the observer can ensure that the incident is fully documented in the observed trip records and the animal can be biologically sampled when possible. Current requirements under the MMPA's Marine Mammal Authorization Program require the Captain to report serious injury and mortalities of marine mammals to NMFS Protected Resources after a trip.
- In pair trawl operations, ensure communication between the boats if fish are being pumped to multiple vessels with only one observer on the trip.
- ~~Strive to make an observer available for both vessels in pair trawl operations~~

This alternative would also encourage the development of a Code of Conduct by/for the herring fishing industry. The Code of Conduct would be designed to improve the working relationship between observer program and vessel personnel, as well as the quality and amount of information provided on unobserved trips. This Code would include standards for cooperation, pre-season meetings with observer program representatives to discuss problems, issues, and protocols for the fishing year, and, to the extent practicable, strive for pre-cruise meetings between the captain, officers, and observers to establish working protocols and methodologies for helping to improve data collection. This Code would also include standards for providing detailed information on unobserved trips, such as details regarding slipped hauls, including estimates of weight, species composition, and the reason for slipping the haul. Vessels will also commit to providing details on species that are excluded from catch due to size and other limitations. Adherence to the Code would be voluntary, and the Code would be established in addition to the measures proposed in this section. Placards to provide important information contained in the Code to crewmembers would be developed for distribution to the fleet.

3.7 CATCH MONITORING ALTERNATIVE 3

This alternative was approved by the Committee and Council for further consideration and development at the January and February 2009 meetings. This alternative includes all of the management measures/options/sub-options described in the following subsections.

This alternative has been designed specifically to meet the following objectives (additional information can be found in Appendix **XXX**):

- Eliminate unverified self-regulation (reliance on vessel reporting to monitor catch)
- Standardized measurement of discarded and landed weights which can be independently verified
- Provide data to facilitate implementation/enforcement of Annual Catch Limits (ACL) as mandated in the Magnuson-Stevens Reauthorization Act (MSRA)
- Eliminate or fully account for at-sea dumping (prohibit dumping of unsampled catch)
- Eliminate pre-sorting (removal of bycatch upstream of catch samplers, including mechanical pre-sorting within the cod-end) including implementation of systems to verify absence of pre-sorting
- Monitor all species including target species (Atlantic herring), incidental catch (landed bycatch), ASMFC species, and protected species
- Untangle past, present and future catch history in preparation for future allocation in the herring fishery
- Assure that all target quotas and bycatch caps can be monitored and enforced in real time
- Measure success or failure of effort controls implemented for bycatch reduction (i.e. time/area closures, days-out, spawning closures)
- Define *first receiver* and design monitoring measures to ensure all herring fishery catch is appropriately sampled by specifying that monitoring will take place at the level of the first receiver. This will help address complex fish-handling vectors in the herring fishery, both traditional ones (at-sea transfer, carriers, carrier-dealers) and newer ones (U.S. At-Sea Processing, pair-trawling, etc.)
- Maximize efficiency through utilization of existing resources (i.e. state port sampling programs); maximize data-quality by standardizing protocols of those programs through incorporation into new system
- Maximize efficiency and flexibility and minimize potential for regulatory workarounds by specifying mandated data elements and guidelines, and then allowing industry to design solutions and select tools to meet those guidelines
- Audit existing monitoring program and all sub-components top to bottom
- Address shortcomings of Framework 43 to the Multispecies FMP
- Examine a wide array of alternatives
- View fish-pumps as an opportunity, not an obstacle (pumps may present unique opportunity to facilitate advanced sampling techniques)
- Solicit advice on monitoring models from experts in other U.S. and foreign fisheries
- Discuss monitoring goals and objectives comprehensively, as opposed to separate discussions divided up by monitoring tools, as in the current discussion document (i.e. avoid separate goals and objectives for at-sea vs. shore-side)

- Adopt a step-wise approach as follows:
 - Design robust monitoring measures to meet data needs
 - Address funding through stand-alone measures

The primary elements of this alternative include Verified Maximized Retention (VMR), with verification via Video-Based Electronic Monitoring (VBEM) at 100% coverage and a target retention rate of 99.5% of total catch, and Dockside Monitoring (DSM) at 100% coverage. The measures proposed in this alternative are intended to apply to those vessels participating in the limited access directed fishery for Atlantic herring (Category A and B vessels).

3.7.1 Measures to Ensure Maximized Retention

This alternative would mandate maximized retention for the Atlantic herring fishery, targeting the landing of 99.5% of all catch. Herring vessels would be required to land all fish that are caught during their fishing operations, and discarding would be largely prohibited.

- Mandatory Maximized Retention (target of 99.5% of all catch landed)
 - Two Categories of Prohibited Species (not to be landed)
 1. Species protected under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) or subject to similar prohibitions will not be landed under any circumstances.
 2. Species for which the vessel is not permitted or is subject to landings limits may be addressed through a series of sub-options (see Section XXX for description of sub-options to address non-permitted landings).
- Mandatory Verification of Compliance with Maximized Retention Requirements
 - At-sea component of vessel-designed Catch Monitoring and Control Plan (CMCP, see below) will be required to outline procedures for the installation and operation of a Video-Based Electronic Monitoring (VBEM) system.
 - CMCP must include detailed procedures to demonstrate the absence of pre-sorting, including demonstration that the codend is empty after each haul and that no fish were slipped from the codend while the codend was in the water (see Section XXX for a description of options to address slippage).

VBEM systems will require two distinct types of support service. While these two service categories may be handled by the same vendor, it is also possible that they would be handled separately. For instance, when CCCHFA pilot-tested VBEM solutions in New England and planning discussions were held pending potential operational implementation, a model was considered in which a local non-governmental organization (NGO) might handle field service and Archipelago would handle analysis. (Needs more development)

- Field service
- Analysis service

3.7.2 Measures to Ensure Actual Weight Measurements or Verifiable Volumetric Proxies

The intent of this measure is to rely on independently-verifiable weights from certified scales (or an approved volumetric proxies) instead of estimates made by captains and dealers.

The tools, called flow scales or hopper scales, are specially designed to deliver an accurate weight for total landings in a fishery which pumps the fish from one place to another. These scales do not slow down or otherwise interfere with the offload process for the vessels or processors. Regulations mandating the installation, maintenance, and use of approved scales or other weighing techniques which can be verified by a shore-based observer for all pelagic fishery offloads forms the first key component of this measure.

Other methods which may also provide certified actual weights include truck scales or certified volumetric estimates based on vessel fish-hold surveys and calibrated measuring techniques. The industry will choose from a range of alternatives for providing a verifiable independent estimate of catch weight, including something as simple as “sticking” a calibrated fish hold or truck, and it will be up to them to choose their preferred techniques. This can be specified in their catch monitoring and control plan (CMCP, see below).

Needs more development re. methods/process for standardization

3.7.3 Measures to Ensure 100% Dockside Monitoring (DSM)

Rigorous sampling of the landed fish and certification of the offload weigh-outs (census of all landing events) by certified shore-based observers forms another critical component of this alternative. 100% coverage of offloads by certified shore-based fishery observers (SBOs) who execute a robust protocol to derive total species-level landings composition would be necessary in this alternative.

Participation in the 100% Dockside Monitoring Program would be mandated.

- Shoreside component of CMCP (see below) will be required to outline procedures for the following catch-handling elements upon landing:
 - Procedures to ensure the presence of a shore-based observer for all landing events;
 - Certification standards for shore-based observers;
 - Minimum data collection standards and protocol guidelines for shore-based observers, including those employed by states (see Section XXX for a description of options for DSM providers);
 - Verification that no pre-sorting takes place upstream of shore-based observers;
 - Procedures to provide a certified measurement of landed weight that is verifiable by the shore-based observer.

3.7.4 Options for Dockside Monitoring (DSM) Service Providers

This section describes a series of options for the provision of DSM services. It also lays out a framework whereby this alternative would maximize available resources by establishing innovative data-sharing agreements and cooperative standardization of protocols amongst existing government sampling efforts (State and Federal) and the anticipated private DSM vendors and NMFS.

Needs More Development

3.7.4.1 Option 1 – Standardize existing state port sampling programs and incorporate them into the proposed action by certifying them as approved DSM vendors

Under this option, the existing port sampling programs run by the States of Maine and Massachusetts would be incorporated into the new catch monitoring program, ensuring that the data they produce is utilized. Their protocols would be standardized and adjusted to meet the required data elements of the proposed action, and State port samplers would only monitor offloads for vessels with an approved CMCP in place. State port sampling data would be converted to landings reports which would in turn be submitted to NMFS-NERO-FSO.

Maine DMR Program

The State of Maine, through the Division of Marine Resources (DMR), has conducted a port sampling program in the herring fishery for several years. Historically, funding for the program, which employs one full-time port sampler and for which DMR contributes supervisory and analysis services, has come from the Atlantic Coastal Cooperative Statistics Program (ACCSP). The program has undeniable value, but would likely be more effective if sampling protocols were changed somewhat.

Under this alternative, the DMR port sampler(s) would implement a standardized sampling protocol that would allow them to certify a landings report for any landing they observed that included landed weights for all species. DMR port sampler(s) would also benefit from other requirements of the program including the requirement to provide a certifiable actual weight or approved proxy and the requirement to demonstrate the absence of pre-sorting.

Massachusetts DMF Program

Few details on the size, scope and sampling strategy of the DMF program are available at this time, in part because the program is quite new, but it is believed to consist of one full-time port sampler. It is also believed to be modeled on the DMR program and is, like that one, voluntary for vessels. It is not known whether the DMF sampler works outside Massachusetts.

Resources are currently available to support an expansion of this program. The Cape Cod Commercial Hook Fishermen's Association (CCCHFA) has recently assisted Massachusetts' fishery managers and state legislators in the development of progressive legislation that will enable the Division of Marine Fisheries (DMF) to build and implement a groundbreaking dockside monitoring system for the pelagic fishing industry. Specifically, a piece of state

legislation, H5054, also known as the Energy and Environmental Bond Bill (EEBB) was signed into law by the Governor in August 2008. The EEBB specifies that the Commonwealth will create a rigorous DSM program with verifiable landings weights and 100% sampling of landing, and also contains a provision to authorize the Governor to appropriate \$750,000 to support such a program.

XXX

3.7.4.2 Option 2 – Implement an immediate or phased-in use of NEFOP observers as shore-based observers for the proposed action, essentially certifying the NEFOP as a DSM vendor

Under this option, NEFOP observers, at currently projected staffing levels or perhaps under a future expansion, would be able to operate as shore-based observers and provide DSM services under the proposed program. While the NEFOP could simply continue to operate as it does now in terms of observing the herring fishery, even once the proposed program were implemented (if chosen by the Council), this option would allow for a more efficient use of resources on all fronts, provided NMFS was satisfied that the proposed program was adequate and therefore supportive of shifting NEFOP personnel from vessel to shore.

There would also be an option for NEFOP to employ a diverse approach to placing Federal observers into this fishery- sometimes on the vessels, sometimes on shore, depending upon data needs and resource availability. This option might allow for a highly efficient use of NEFOP personnel otherwise on “stand-by” for various reasons and thus unable to go to sea to observe the herring fishery (see Option 6 in Section XXX below for more information).

3.7.4.3 Option 3 – Implement a single-service provider plan for DSM operations which cannot be covered by shore-based observers employed by state or Federal agencies

XXX

3.7.4.4 Option 4 – Implement a multi-service provider plan for DSM operations which cannot be covered by shore-based observers employed by state or Federal agencies

XXX

3.7.5 Requirements for Catch Monitoring and Control Plans (CMCPs)

This component of this alternative is intended to assure that the industry retains control and flexibility over fishing, landing, and processing operations while still ensuring the delivery of a robust data collection program. **Pelagic fishery vessels and dealers would be required to design and submit for approval a Catch Monitoring and Control Plan (CMCP) that would outline in detail how they will meet the catch monitoring and control standards set by the Council and NMFS.**

The standards specified in this amendment would outline requirements for each CMCP to include the following: sorting and weighing all landings under the oversight of the shore-based observer (SBO), notification requirements in advance of a landing, use of approved scales or other weighing techniques, provision of safe and convenient access points and sampling locations for SBO, and procedures to ensure that no unobserved pre-sorting occurs, including at-sea through the installation and operation of a VBEM system.

Under this alternative, catcher vessels are defined as first receivers and are responsible for CMCP design and submission. CMCP must cover all possible offload scenarios, including cod-end handling and pump-out procedures between pair trawl vessels, and may include cooperative arrangements with dealers and/or carriers and/or receivers of at-sea transfers including USAP vessels if necessary and appropriate.

The Council will specify data collection standards that dockside monitoring (DSM) provider protocols must meet, including but not limited to the following:

- All catch will be sampled and/or sub-sampled for each landing event;
- Actual measured weights or certified volumetric estimates will be collected for all species;
- Landing estimates for all species will be produced for each landing event;
- A strictly census-style approach to catch sampling will not be permitted unless it is demonstrated that every fish is actually sorted and examined.

The Council will specify CMCP elements and design parameters:

- All CMCPs must outline fish handling procedures in detail such that the absence of pre-sorting can be verified or the pre-sorted fish can be clearly demonstrated to be retained and provided to the shore-based observer;
- All CMCPs must provide an explanation of how a certified, independently verifiable weight or volumetric conversion will be attained for all species;
- All CMCP must provide an outline of the VBEM system to be operated and its installation specifications.

Shoreside component of CMCP (see below) will be required to outline procedures for the following catch-handling elements upon landing:

- Procedures to ensure the presence of a shore-based observer for all landing events
- Certification standards for shore-based observers
- Minimum data collection standards and protocol guidelines for shore-based observers, including those employed by states (**see Section 4.4.4- options for DSM providers**)
- Verification that no pre-sorting takes place upstream of shore-based observers
- Procedures to provide a certified measurement of landed weight that is verifiable by the shore-based observer

NMFS will approve CMCP on an annual or semi-annual basis as part of fishery permit renewal procedures.

3.7.6 Reporting/Analysis Requirements

This component of the catch monitoring program will ensure that the information generated through the program enters into the management system quickly and accurately. Shore-based observers will certify and report the weight and species composition of each landing within 24 hours of its conclusion, providing real time data. Analysts will compile, audit, and summarize the data produced under this program, quickly generating hard numbers on landed catch and bycatch of all species. VBEM data will be checked subsequently to reconcile landings against fishing activity to verify compliance with maximized retention requirements.

Specification of Procedures for Centralized Analysis and Reporting

- Shore-based observers will submit certified landings reports to relevant supervisory entity (state/Federal agency or certified vendor).
- Supervisory entity will submit landings summary reports to the Fisheries Statistics Office (FSO) at the NMFS Northeast Regional Office (NERO) and the VBEM analysis vendor.
- FSO undertakes the same tasks they currently perform, only with higher-quality and more timely data than they currently use. Specifically, FSO tallies landings reports, including reconciliation against Dealer Electronic Reporting (DER) and vessel reporting, and produces summarized landings reports for all species which are publicly available. For quota and bycatch cap monitoring purposes, landings are assumed to equal catch until and unless analysis of VBEM data shows that a discard event has occurred, at which point catch estimates would be revised. Existing vessel and dealer self-reporting and Northeast Fisheries Observer Program (NEFOP) data may be used as a backup until and unless they are discontinued if and when they are demonstrated to be unnecessary.
- VBEM field service vendor collects VBEM data from vessels, performs system operation checks to verify that no data gaps are evident, which might indicate non-compliance or mask a discard event, and provides data including imagery to VBEM analysis vendor.
- VBEM field service vendor also performs maintenance and outreach services to assist vessels in ensuring continuous high-quality VBEM system operation.
- VBEM analysis vendor reconciles VBEM dataset with landings summary reports to certify compliance with maximized retention and provides a summary report to FSO.

3.7.7 Options to Address Non-Permitted Landings by Herring Vessels

This alternative may present a regulatory obstacle in that maximized retention provisions will likely require the landing of certain species for which herring vessels have landing limits or are not currently permitted to land at all. This section describes a series of options to potentially address this obstacle, as well as sub-options to address the disposition of the non-permitted landings.

3.7.7.1 Option 1 – Amend Other FMPs and Regulations to Allow Landings

Under this option, a number of other Fishery Management Plans would be amended to modify limits or prohibitions which might affect herring vessels attempting to participate in a maximized retention program. For instance, the Multispecies FMP would need to be amended to change landings limits for all other groundfish species except haddock, which has a separate, fishery-wide cap. Jurisdictional overlap may occur for species managed by the Atlantic States Marine Fisheries Commission (ASMFC), and ASMFC plans might need to be amended.

In order to be effective in a timely fashion, work on these amendments would likely need to begin concurrent to the development of Amendment 4. Thus a necessary precursor to this option might need to be a very early Council decision to pursue development of a maximized retention program so that the cross-fishery regulatory infrastructure could be built. Impact on these other species would clearly need to be capped at biologically and economically appropriate levels, thus there is a preferred sub-option for this option which would set bycatch caps on all species for the herring fishery.

Several sub-options are under consideration relative to this measure and the treatment of non-permitted or non-authorized catch. Additional sub-options address whether or not such fish landed outside current regulations could be sold, and, if so, how the revenues could be utilized.

- Sub-option 1A:** Allow landing of non-permitted catch, including in excess of current trip limits, with such landings subject to appropriate caps (Preferred);
- Sub-option 1B:** Allow landing of non-permitted catch, including in excess of current trip limits, without caps (Non-Preferred).
- Sub-option 2A:** Allow sale of catch landed outside of current regulatory allowances with revenues returned to NMFS for use in management of fishery targeting species in question;
- Sub-option 2B:** Mandate that catch landed outside of current regulatory allowances is donated to food banks;
- Sub-option 2C:** Mandate that catch landed outside of current regulatory allowances must be destroyed.

3.7.7.2 Option 2 – Annual Issuance of Exempted Fishing Permits

Under this option, the maximized retention program would operate under an Exempted Fishing Permit (EFP) issued by the Sustainable Fisheries Division (SFD) at NERO on an annual basis. Vessels would apply annually and NMFS would issue EFPs provided all program participation requirements were met and program elements were in place. The EFP would provide the regulatory relief necessary to allow the currently non-permitted landings to take place.

All of the Sub-options described above under Option 1 (Section XXX) would be applicable under Option 2 and would need to be considered by the Council if Option 2 is selected.

Discussion

The maximized retention program in the Pacific Council's shore-based hake fishery currently operates under an EFP, as it has for approximately seven years, although this fishery is fairly far along in the process of transitioning to a fully-approved program without annual EFPs.

3.7.7.3 Option 3 – Modified Maximized Retention: Use VBEM to Monitor Minimal At-Sea Discards

Under this option, modifications to the at-sea components of a CMCP would specify that any at-sea discards must be disposed of through a designated discard chute with monitoring through an additional camera close enough in range to distinguish species. The wide-angle deck-wide and rail-area cameras would essentially identify pre-sorting as they would under the maximized retention measures, and imagery analysis would be conducted to confirm that the pre-sorted piece count observed matched the piece count sent through the discard chute one at a time. Additional imagery analysis would be conducted to identify each discarded animal to its species and estimate its size and weight based on the high-quality look at it the closed circuit television (CCTV) cameras will be afforded as the animal passes through the discard chute.

This option could potentially be applied for specific species for which no regulatory relief is possible. It may also be necessary to implement this option for certain prohibited species, for instance marine mammals or birds.

3.7.8 Options for Net Handling to Address Slippage

This alternative may present a challenge in that rigorous protocols may have to be developed to address slippage (the dumping of catch directly from the codend without it being brought on board). Accommodation should be made to allow this practice for legitimate safety reasons, so the challenge is therefore to minimize and mitigate it. A further challenge will be to devise net-handling techniques to assure that slippage does not occur and demonstrate this fact adequately such that the VBEM can verify the absence/minimization of slippage.

Finally, particular attention should be paid to a subset of slippage events which are relatively low in volume on a tow-by-tow basis, but probably fairly significant overall given the number of tows in a fishing year. This would be the "operational discards," a term used to describe the fish that are left in the net at the conclusion of pumping. It is possible that these operational discards are not representative of what was pumped, so they must be sampled carefully. By its nature, slippage occurs underwater, and thus devising techniques to document it will be difficult.

The proposed requirement for a CMCP can address this. While this section will briefly outline (as sub-options) a series of suggested net handling techniques, the preferred alternative will be to place the burden on the herring industry to devise and document techniques to demonstrate that slippage has not occurred and secure approval for those techniques through the CMCP.

3.7.8.1 Option 1 – Maximized Retention Techniques Addressed Through CMCP

Under this option, vessels would have the flexibility to design their own plans for demonstrating compliance with maximized retention provisions. The vessels' plan would be described in the CMCP and approved by NMFS.

3.7.8.2 Option 2 – Maximized Retention Techniques Developed in Amendment 4

Under this option, the Council would develop standards and management measures to ensure compliance with maximized retention provisions. These standards would be implemented in Amendment 4 and would apply to all Category A and B vessels.

Sub-Options

Sub-option 2A – Interruption Prohibition: Under this sub-option, removal of the pump from the codend once pumping has been initiated would be prohibited unless the vessel was able to lift the net from the water and demonstrate in a visible way that the codend was either empty or was re-purged before being placed back in the water.

Sub-option 2B Codend Lifting: Under this sub-option, the vessel would be required to lift the codend from the water to visibly demonstrate that it was empty prior to re-setting the net.

Sub-option 2C Bring Codend Aboard: Under this sub-option, the vessel would be required to bring the codend aboard the vessel to visibly demonstrate that it is empty or that the catch remaining in the net was removed to the deck and either retained or visibly discarded.

3.7.8.3 Option 3 – Unobservable Fishery

Under this option, if no techniques to ensure that slippage does not occur or that slipped fish are measurable and identifiable are possible, the Council would declare the herring fishery “unobservable,” and the fishery would be suspended indefinitely until appropriate techniques could be developed to observe all of the catch.

3.7.8.4 Sub-Options to Address Non-Compliance with Maximized Retention

Sub-options 1 and 2: Suggestions for penalties/accountability measures specific to maximized retention non-compliance including failure to visibly demonstrate maximized retention compliance

Sub-option 1A: Apply **assumed** slippage event tonnage against at-sea discard cap

Under this sub-option, an assumed tonnage for each detected or suspected/inferred slippage event would be applied against an overall tonnage cap on at-sea discards in the fishery. The assumed amount would be set at the current best estimate for the average tow in the fishery (approximately 65 tons). Since the goal of the maximized retention program is to land 99.5 % of the catch, the total at-sea discard cap would be set at 0.5% of the TAC in the fishery (approximately 500 tons at current TAC levels).

Sub-option 1B: Apply estimated slippage event tonnage against slippage cap

Under this sub-option, an estimated tonnage for each detected slippage event would be applied against an overall tonnage cap on at-sea discards in the fishery. The estimated amount would be based on an independent measure of the total weight of the slipped discards. Captain's estimates would not be accepted. Therefore, this sub-option would only be practical in cases in which the VBEM dataset provided a clear and acceptable estimate of weight, or in which the vessel had additional EM technology such as catch-weight sensors in the CMCP, or in which an at-sea observer happened to be aboard. Since the goal of the maximized retention program is to land 99.5 % of the catch, the total at-sea discard cap would be set at 0.5% of the TAC in the fishery (approximately 500 tons at current TAC levels). Suspected/inferred slippage or discard events would still be subject to the assumed tonnage application because by definition, no actual data would exist for these events.

Sub-option 2A: Apply assumed slippage event tonnage against species specific bycatch caps (preferred)

Under this sub-option, an assumed tonnage for each detected or suspected/inferred slippage event would be applied against all target species quotas and against individual tonnage caps on all bycatch species in the fishery. The assumed amount would be set at the current best estimate for the average tow in the fishery. Individual species quotas would be set at biologically-appropriate levels for each species and in consideration of economic and other concerns of all other fisheries targeting those species. The multiple-jeopardy nature of this approach could be severe, but desirable in that it will have a strong likelihood of success at achieving the desired result of eliminating slippage and undetected at-sea discard events.

Sub-option 2B: Apply estimated slippage event tonnage against species specific bycatch caps

Under this sub-option, an estimated tonnage for each detected slippage event would be applied against all target species quotas and against individual tonnage caps on all bycatch species in the fishery. The estimated amount would be based on some independent measure of the total weight of the slipped discards. Captain's estimates would not be accepted. Therefore, this sub-option would only be practical in cases in which the VBEM dataset provided a clear and acceptable estimate of weight, or in which the vessel had additional EM technology such as catch-weight sensors in the CMCP, or in which an at-sea observer happened to be aboard. Individual species quotas would be set at biologically-appropriate levels for each species and in consideration of economic and other concerns of all other fisheries targeting those species. The multiple-jeopardy nature of this approach could be severe, but desirable in that it will have a strong likelihood of success at achieving the desired result of eliminating slippage and undetected at-sea discard events. Suspected/inferred slippage or discard events would still be subject to the assumed tonnage application because by definition, no actual data would exist for these events.

Sub-Option 3: Consequences of Quota or Bycatch Cap Overages

Under this sub-option, if an at-sea discard caused an overage, or an at-sea discard event is suspected/inferred based on VBEM data or absence of data, and the event is known or suspected to have caused resulted in a quota or bycatch cap overage, the offending vessel would be suspended from the herring fishery for the following fishing year, and all other vessels would be forced to pay back the overage. The offending vessel also would be forced to carry an at-sea

observer at its own expense, in addition to participating in the maximized retention and dockside monitoring program under the proposed action, for an additional probationary year.

Discussion

In addition to the schedule of penalties and violations that are specific to a failure to adequately demonstrate that no catch was slipped on every haul (i.e. demonstrate compliance with maximized retention requirements, described above), a schedule of general penalties should be created to discourage non-compliance with the overall catch monitoring program, including such violations as failure to adhere to the provisions of a CMCP, fishing without an operational VBEM system, failure to cooperate with a shore-based observer, etc..

Specification of Measures to Address Non-Compliance with Program Requirements

- Non-compliance with any or all of the following program elements must be considered a serious violation and strict measures must be in place to both punish violators and deter future infractions:
 - Failure to adhere to provisions of an approved CMCP;
 - Failure to adhere to maximized retention requirements; and
 - Deliberate interference with VBEM system operation.
- Accountability measures should be established to account for monitoring and/or quota/bycatch cap accounting errors caused by such non-compliance.

3.7.9 Options for Modifying This Alternative

If there is a need to modify the general approach proposed in this alternative, or to perhaps phase-in some of the measures, the following options are proposed for consideration.

3.7.9.1 Option 1 – 100% Verification by At-Sea Observers

Under this option, maximized retention would be verified by at-sea observers at a rate of 100%. At-sea observers would certify compliance with maximized retention requirements and sample any at-sea discards that did take place, but the vast majority of catch sampling would be done dockside, as would the certified weighing or certified volumetric estimation of landed weight.

3.7.9.2 Option 2 – Hybrid Option

Under this option, a combination of VBEM and monitoring by at-sea observers would be used to verify maximized retention. Potential sub-options include allowing industry to choose which verification vector to employ.

3.7.9.3 Option 3 – <100% Verification Coverage

Under this option, verification of maximized retention would not be done 100% of the time, and self-reporting would be relied upon for assurances that landed weight is equal to catch.

3.7.9.4 Option 4 – <100% Dockside Monitoring Coverage With Extrapolation

Under this option, shore-based observers would be present and sample at less than 100% of landing events, but the coverage would be statistically designed to allow for the extrapolation of observed landings, including bycatch and incidental catch rates, across the entire fleet such that unobserved landings had a bycatch rate applied.

3.7.9.5 Option 5 – <100% Dockside Monitoring Coverage Without Extrapolation

Under this option, shore-based observers would be present and sample at less than 100% of landing events, but the coverage rate and coverage design would not allow for the extrapolation of observed landings, including bycatch and incidental catch rates, across the entire fleet such that unobserved landings had a bycatch rate applied.

3.7.9.6 Option 6 – Phased-In Approach

Under this option, the proposed action would be implemented as proposed, but instead of full implementation of the maximized retention/VBEM/DSM program effective immediately with the implementation of Amendment 4, the program would be phased in. Full implementation of the proposed action presumes that program infrastructure will have been sufficiently developed concurrent to the development of final Amendment 4 measures. This may not be possible, and if so, under this option, the primary source of catch information would continue to be the current observer program and the existing State DSM programs during the phase-in period. As a result, the Council would mandate, and NMFS would implement provisions to ensure that during the phase-in period, sea sampling and/or state port sampling data are subject to fleet-wide extrapolation to provide total catch estimates for the fishery.

3.7.10 Possible Sources of Funding

XXX

Table 7 Preliminary List of Potential Funding Sources

Source	Potential Contribution
Maine DMR Program (ACCSP)	\$100,000
Mass DMF Program (existing)	\$100,000
Mass DMF Program (EEBB)	\$750,000
Congressional MSRA research appropriation	\$2,000,000
Herring RSA dedication (3% of 75,000 mt annual landings @ \$.10 per pound)	\$496,000
New quota set-aside program (1.5% of 75,000 mt annual landings @ \$.10 per pound)	\$248,000
Landings surcharge (\$0.01 per pound)	\$1,600,000
Industry cash payments (3% of average per trip ex vessel revenue)	\$600,000
Potential Total	\$5,894,000

The preliminary analysis in Table 7 does not assume any contribution from NMFS except an in-kind contribution of the following services:

- FSO will continue to act as the centralized processing entity for summarized catch, discard, and landings information and also make this information publicly available.
- NMFS will certify CMCP plans as designed and submitted by first receivers (vessels).
- NEFOP would continue to cover the fishery in some manner, including ongoing at-sea coverage, but possible also including shore-based coverage at some future point, and also possible including at-sea coverage during testing and/or phase-in periods for VBEM/MR/DSM when a control is needed in the form of at-sea observers.

The potential funding sources above represent a suggested array of mix and match options to draw from in order to finance the proposed monitoring program. Of the sources, two are one-time possibilities: the Massachusetts funding under the EEBB and the potential Congressional appropriation of funds authorized under the MSRA. The latter were written into the MSRA for the purpose of funding ecosystem research in the herring fishery.

All the other sources are annualized possibilities and could be mixed, matched or modified. The proposal assumes that Maine and Massachusetts continue their port sampling programs and fold them into the Amendment 4 monitoring program in an official capacity. The existing Research Set-Aside (RSA) could be prioritized towards monitoring and/or an additional RSA program could be created. A per-pound landings fee could be assessed.

Finally, assuming an average trip in the Category A and B herring fishery of 100 mt (based on data in the Amendment 4 Draft Discussion Document), and assuming an average ex-vessel price of \$.10 per pound, average per trip revenues are assumed to be about \$22,000 dollars. At a 3% cash contribution to monitoring for 1,000 trips per year in the fishery (taken from data presented to the Herring Committee by NEFOP on 5/22/08), approximately \$600,000 per year would be available for funding this program.

3.8 CATCH MONITORING ALTERNATIVE 4

This alternative was approved by the Committee and Council for further consideration/development at the January and February 2009 meetings. This alternative includes all of the management measures/options described in the following subsections.

- Determining the size composition of the herring catch will be an essential element of the program because of the importance of the catch of juvenile herring at certain times/places.
- Bycatch/discards of all other species caught while fishing for herring must be monitored and identified by gear type.
- Offshore January – March and April – June midwater trawl bycatch in the Mid-Atlantic region must be considered because of concerns about shad, river herring, and striped bass and to get a better handle on slippage events.
- Inshore areas off Gloucester and NH should be monitored, especially in October/November, which may be a “hotspot” for river herring/shad bycatch.
- Catch monitoring should be adequate to monitor the haddock catch cap.
- Midwater trawling access to groundfish closed areas will be incorporated into this alternative. Observer coverage linked to access to these areas (100%) will be part of the amendment, as well as criteria to determine what would lead to loss of access.
- More work needs to be done to improve accuracy of quota monitoring on a real-time basis.
- Industry-Funded Observer Program – development of an industry working group to determine the pros and cons of such a system and to develop details for the Council’s consideration. MA DMF can facilitate this discussion.
- Clear and unambiguous guidance from the Council is necessary.

XXX

4.0 MEASURES TO ADDRESS INTERACTIONS WITH THE ATLANTIC MACKEREL FISHERY AND RELATED BYCATCH CONCERNS

The limited access permit program implemented in Amendment 1 to the Herring FMP established three types of herring limited access permits: (1) a limited access directed fishery permit that allows access to all management areas with no possession limit (Category A); (2) a limited access directed fishery permit that allows access to Areas 2/3 only with no possession limit (Category B); and (3) a limited access incidental catch permit that allows access to all management areas with a possession limit of 25 mt (55,000 pounds) and a restriction of one landing per calendar day (Category C). The limited access Category C incidental catch permit was developed primarily to address the incidental catch of herring by mackerel vessels that do not qualify for a directed fishery permit in any of the management areas. Qualification criteria for the limited access incidental catch permit were less restrictive and spanned a longer qualifying time period (15 mt in any calendar year from 1988 – 2003).

Amendment 1 also established an open access incidental catch permit for vessels that do not qualify for either of the limited access permits (Category D). The possession limit associated with the open access incidental catch Category D permit is 3 mt per trip in all management areas, with a restriction of one landing per calendar day.

As of August, 2008, the following information is available about vessel permitting:

Table 8 Amendment 1 Limited Access Permits Issued as of August, 2008

2008 Permits Issued (LA = limited access)			
Category A (LA All Areas)	Category B (LA Areas 2/3)	Category C (LA Incidental)	Category D (Open Access)
41	4	42	2,219

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

At its April 30, 2008 meeting, the Herring Advisory Panel briefly discussed issues raised in the Amendment 4 Scoping Document regarding the interaction of the Atlantic herring and mackerel fisheries and the potential for herring bycatch on mackerel vessels that may not possess a limited access permit for herring. One advisor described the issue and suggested that there may be about

12 vessels in the southern New England/Mid-Atlantic region that may receive limited access mackerel permits but do not have a limited access herring permit and would therefore continue to be limited to 3 mt of herring per trip. The concern about herring bycatch on mackerel vessels appears to be primarily in Areas 2 and 3 where the herring TACs are not yet fully utilized, so the advisors agreed that there may be an opportunity to allow the vessels in these areas to retain additional amounts of herring.

HERRING AP MOTION (April 30, 2008): Jeff Reichle/Vito Calomo

To recommend that any vessels issued a limited access mackerel permit that do not have a limited access herring permit be allowed to retain up to 25 mt of herring as incidental catch in the mackerel fishery (Motion carried 9-0-3).

At its July 30, 2008 joint meeting with the Herring Advisory Panel, the Herring Committee discussed this issue and passed the following motion, directing the Herring PDT to draft management alternatives for consideration and provide additional information:

HERRING COMMITTEE MOTION (July 30, 2008): MIKE LEARY/DANA RICE

As an alternative in Amendment 4, that Area 2/3 Category D Incidental Limit be Raised to 25 mt (Motion carried unanimously).

Additional Discussion on the Motion: One advisor suggested that the Committee may want to consider limiting this measure to only vessels with mackerel permits. The mackerel fishery is an open access fishery now, but the Mid-Atlantic Council is in the process of developing a limited access program in an amendment. Another advisor asked about whether this could apply to vessels fishing for whiting in Area 1, but the Committee agreed that the intent of the motion is to consider increasing the trip limit only in Areas 2 and 3 because the Area 1A TAC is already fully utilized. The Committee also agreed that the PDT could develop options that incorporate the suggestion regarding possession of a mackerel permit.

4.1 PROPOSED MANAGEMENT ALTERNATIVES

The management alternatives currently under consideration in Amendment 4 to address this issue were developed by the Herring PDT based on Herring Committee and Advisory Panel guidance (see above) and are described below. Herring PDT comments/recommendations are included below for the Herring Committee's consideration as the alternatives are further refined. Background information and analysis used to develop the proposed measures are provided by the Herring PDT in Section 4.2 of this document.

Herring PDT Comments/Recommendations

The Herring PDT provides the following comments and recommendations at this time regarding the development of management alternatives to address this issue in Amendment 4:

- Available fishery data do not indicate that the current 3 mt possession limit of herring for open access permit holders is problematic at this time; it does not appear to be resulting in bycatch/regulatory discards for vessels fishing in any of the management areas and reporting their herring landings and discards through the logbooks.

- The overlap between the Atlantic herring and mackerel fisheries is universally recognized as an important fishery management issue that the Council has always intended to accommodate in the most appropriate manner. If the Category D vessels have not been targeting mackerel or taking trips where they may encounter a mix of herring and mackerel (and/or other species) more recently (for a variety of reasons), VTR records may not reflect a bycatch problem at this time and may not fully characterize the potential for this problem to exist in the future. The industry has stated that these vessels have not been fishing for mackerel as much in recent years because (1) they are smaller vessels, and the mackerel fishery shifted into offshore areas; and (2) concerns about encountering herring in quantities larger than 3 mt on “mixed” trips and consequently being in violation of the herring possession limit have influenced their decisions about taking these trips at all.
- Because the data do not indicate that a bycatch problem exists at this time, the Herring PDT expressed concern with increasing the open access incidental catch possession limit in Areas 2 and 3 to as much as 25 mt (55,000 pounds) at this time. This is the same amount of herring that is allowed under the current Category C limited access incidental catch possession limit, so increasing the limit for the open access permit to this amount essentially negates the benefit/effect of having a limited access incidental catch permit in Areas 2 and 3.
- Although the TACs are not fully utilized in Areas 2 and 3 at this time, the Herring PDT is concerned that increasing the open access possession limit to 25 mt, especially in Area 2, may create additional opportunities for vessels to target herring directly under the open access permit. This outcome could very well be likely given the (low) levels of landings that have been documented by open access permit holders in recent years. Increasing the possession limit for open access permit holders to 25 mt could create a “loophole” that is inconsistent with the intent of the herring limited access program, as well as the open access permit, implemented in Amendment 1. The Council created the open access possession limit permit in Amendment 1 to minimize the potential for directed herring fisheries to develop while still providing controlled opportunities for vessels in other fisheries to catch small amounts of herring and minimize their bycatch. Decisions regarding increased opportunities in these areas should be made with adequate consideration of overall fleet capacity and the long-term effects of over-capacity.
- Moreover, if additional opportunities for directed fishing in Areas 2/3 result from an increase in the open access possession limit, new vessels could create fishing history in these areas. This is a **very** important consideration if quota allocation programs are going to be developed for the herring fishery. Increasing the open access possession limit to a level that allows for directed fishing and the establishment of any substantial amount of fishing history could increase the number of participants to be considered in a sector allocation or individual quota allocation program, should the Council choose to develop one in the future.
- **Based on the concerns about increasing opportunities for directed fishing in Areas 2/3, the Herring PDT recommends the following:**
 - An additional alternative that proposes an increase in the open access possession limit for Areas 2/3 less than 25 mt (10,000 pounds is proposed, see Alternative 4, Section 4.1.4); an alternative like this would help to bound the range of alternatives under consideration in this amendment and would provide the Council with greater flexibility when selecting final measures;

- The possession limit associated with the open access herring permits could be added to the list of measures that can be implemented through a framework adjustment to the Herring FMP. This will provide a mechanism to modify the open access possession limit (increase or decrease) in a more timely manner in the future.
- Needs additional discussion with NMFS
- The Herring PDT seeks guidance from the Committee regarding the current draft alternatives (described below) as well as any additional alternatives that should be developed for further consideration. It is unclear at this time whether the Herring Committee is interested in exploring options for incidental catch in Areas 2/3 based on a percentage of total catch, a ratio of herring/mackerel landings, and/or TAC set-asides to address these issues. However, these approaches could be more complicated to administer and enforce than the current alternatives under consideration.

4.1.1 Mackerel Alternative 1 – No Action

Under this alternative, no action would be taken in Amendment 4 to address herring/mackerel fishery interactions and concerns about the potential for herring bycatch in the directed mackerel fishery.

- The open access incidental catch permit for herring (Category D) would continue to apply to all management areas.
- Vessels that obtain the open access incidental catch herring permit would continue to be restricted by a possession limit of 3 mt of herring per trip (6,600 pounds) in all management areas and limited to one landing per calendar day up to the 3 mt possession limit.
- When the TAC in a management area is projected to be reached and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.
- Open access permit holders catching more than 2,000 pounds of herring per week would continue to be required to report their catches on a weekly basis through the IVR reporting program.

4.1.2 Mackerel Alternative 2 – Increase the Open Access Possession Limit to 25 mt in Areas 2/3 Only

Under this alternative, two open access permits for herring would be created, one for Area 1 and one for Areas 2/3:

1. The current provisions for the Category D permit, including the 3 mt possession limit, reporting requirements, and landings restrictions, would apply to an open access permit for Area 1 (1A and 1B), as described in the no action alternative;
2. An open access incidental catch permit would be created to apply to Areas 2/3 only; this permit would be associated with a **25 mt (55,000 pounds)** possession limit for herring; all other provisions currently associated with the current open access Category D permit would apply:

- Vessels that obtain the open access incidental catch herring permit for Areas 2/3 only would be restricted by a **possession limit of 25 mt** of herring and limited to **one landing per calendar day** up to the 25 mt possession limit.
- When the TAC in a management area is projected to be reached and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.
- Open access permit holders catching more than 2,000 pounds of herring per week would continue to be required to report their catches on a weekly basis through the IVR reporting program.

4.1.3 Mackerel Alternative 3 – Increase the Open Access Possession Limit to 25 mt in Areas 2/3 for Vessels that also Possess a Federal Mackerel Permit

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

1. The current provisions for the Category D permit, including the 3 mt possession limit, reporting requirements, and landings restrictions, would apply to an open access permit for all management areas, as described in the no action alternative;
2. **A new open access incidental catch permit would be created for mackerel fishery participants in Areas 2/3 only**; this permit would be associated with a **25 mt (55,000 pounds)** possession limit for herring; all other provisions currently associated with the current open access Category D permit would apply:
 - Vessels that do not qualify for a limited access herring permit and possess a federal permit for Atlantic mackerel would be eligible for this herring permit. *(The Atlantic mackerel fishery is currently an open access fishery, but it is assumed that once a limited access program is implemented for the mackerel fishery, this alternative would require possession of a federal limited access mackerel permit.)*
 - **Vessels that obtain the open access incidental catch herring permit for mackerel fishery participants in Areas 2/3 would be restricted to fishing for herring in Areas 2/3 only, under a possession limit of 25 mt (55,000 pounds) of herring and limited to one landing per calendar day up to the 25 mt possession limit.**
 - When the TAC in a management area is projected to be reached and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.
 - Open access permit holders catching more than 2,000 pounds of herring per week would continue to be required to report their catches on a weekly basis through the IVR reporting program.

Additional Discussion – Mackerel Limited Access Program

While the mackerel fishery is currently an open access fishery, the Mid-Atlantic Council is in the process of developing Amendment 11 to the Squid, Mackerel, and Butterfish FMP, which will implement a limited access program for mackerel. The Mackerel Committee is close to

finalizing a range of alternatives for the proposed mackerel limited access program and is resolving outstanding issues so that the document can move forward through the public hearing process. The Draft EIS for Mackerel Amendment 11 is scheduled to be approved by the Council in late 2008 or early 2009, with implementation anticipated for late 2009 or early 2010. If this schedule is met, the mackerel limited access program would likely be implemented prior to the measure in Amendment 4 to the Herring FMP, so this alternative would apply to vessels that possess a limited access permit for mackerel.

Alternatives under consideration for the limited access program for the Atlantic mackerel fishery are based on a multi-tiered approach to a limited access permit structure, with each tier specifying different criteria for limited access qualification. Proposed qualification for a “Tier 3” mackerel permit, for example, include poundage thresholds for herring and/or possession of a herring limited access permit in order to address the overlap between the two fisheries and minimize problems that may result if herring vessels do not receive limited access permits for mackerel. Additional information will be made available as the Mid-Atlantic Council finalizes the limited access alternatives under consideration in Amendment 11.

4.1.4 Mackerel Alternative 4 – Increase the Open Access Possession Limit to 10,000 Pounds in Areas 2/3 Only

Under this alternative, two open access permits for herring would be created, one for Area 1 and one for Areas 2/3:

1. The current provisions for the Category D permit, including the 3 mt possession limit, reporting requirements, and landings restrictions, would apply to an open access permit for Area 1 (1A and 1B), as described in the no action alternative;
2. An open access incidental catch permit would be created to apply to Areas 2/3 only; this permit would be associated with a **10,000 pound** possession limit for herring; all other provisions currently associated with the current open access Category D permit would apply:
 - Vessels that obtain the open access incidental catch herring permit for Areas 2/3 only would be restricted by a **possession limit of 10,000 pounds** of herring and limited to **one landing per calendar day** up to the 10,000 pound possession limit.
 - When the TAC in a management area is projected to be reached and the directed fishery closes, incidental catch in the area would be limited to 2,000 pounds per trip, as it is currently.
 - Open access permit holders catching more than 2,000 pounds of herring per week would continue to be required to report their catches on a weekly basis through the IVR reporting program.

4.2 BACKGROUND INFORMATION/ANALYSIS

4.2.1 Trends in the Atlantic Mackerel Fishery

The Atlantic mackerel fishery continues to evolve. U.S. commercial landings of Atlantic mackerel from 1982 to 2006 and annual quotas (1994-2006) are summarized in Table 9 and Figure 2. U.S. commercial landings of Atlantic mackerel increased gradually from less than 3,000 mt in the early 1980s to around 10,000 mt in 1990. In the 1990s, U.S. management policy eliminated the directed foreign Atlantic mackerel fishery in the EEZ. Atlantic mackerel landings by U.S. vessels in the 1990s ranged from 4,700 mt in 1993 to 15,500 mt in 1996 and 1997. U.S. landings were approximately 12,500 mt in 1999 and declined to 5,600 mt in 2000. After 2000, Atlantic mackerel landings increased markedly from 12,300 mt in 2001 to 59,000 mt in 2006.

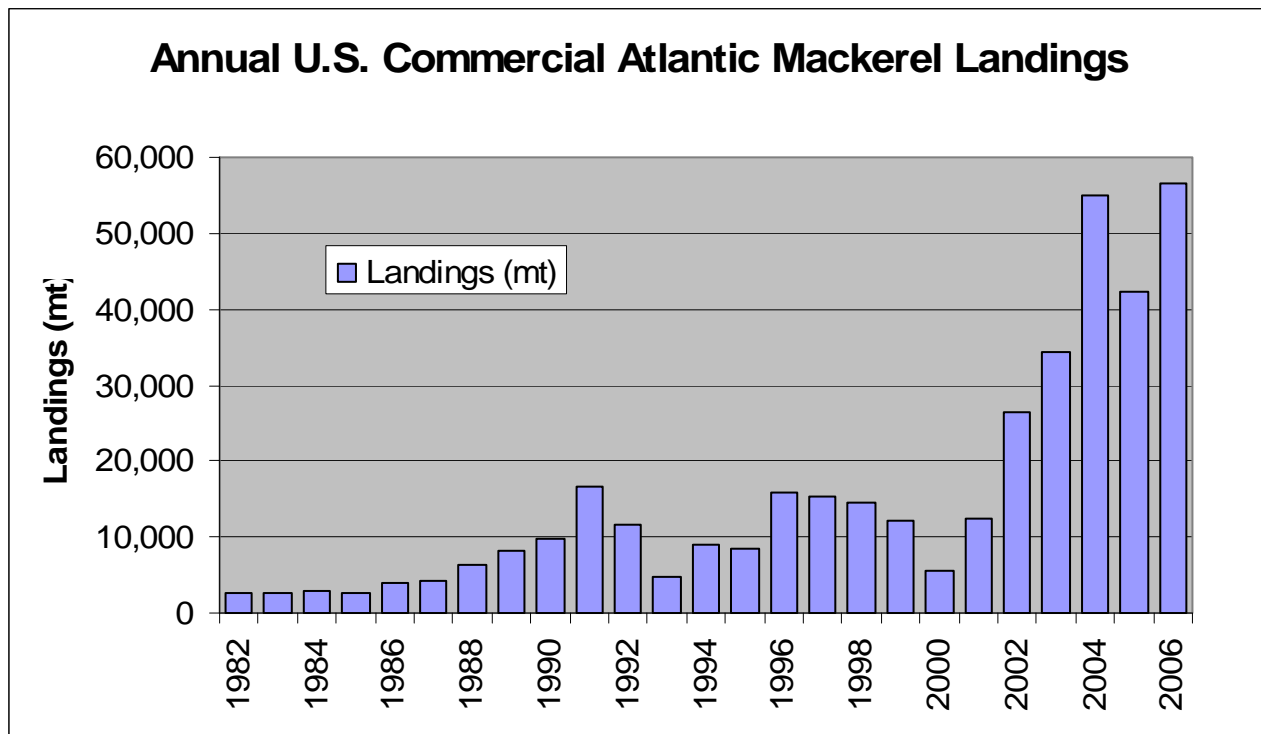
Preliminary information suggests that mackerel landings dropped significantly in 2007 to about 25,545 mt valued at about \$6.6 million.

Based on data from the Northeast Region Dealer Weighout database, the vast majority of commercial Atlantic mackerel landings are taken by trawl gear (Table 9). Among trawl types, midwater otter trawls and paired midwater otter trawls have become increasingly important in recent years. From 2002-2006, paired midwater trawls comprised 38% of commercial Atlantic mackerel landings, while unspecified midwater trawls also accounted for 40% of the landings, and bottom otter trawls comprised only 14% of the landings. By comparison, from 1996-2000, paired midwater trawls landings comprised only 2% of the total commercial Atlantic mackerel landings, while unspecified midwater trawls accounted for 22% of the landings, and bottom otter trawls accounted for 71% of the landings.

Table 9 U.S. Commercial Atlantic Mackerel Landings (mt) 1982 – 2006, by Major Gear Type and Recent Quota Specifications

YEAR	BOTTOM TRAWL	MIDWATER TRAWL	PAIR TRAWL	ALL OTHERS	TOTAL	INITIAL OY (IOY)	% of IOY LANDED
1982	1,908		19	744	2,671		
1983	890		410	1,342	2,642		
1984	1,235	118	396	1,045	2,795		
1985	1,481		249	905	2,635		
1986	3,436		2	514	3,951		
1987	3,690		0	649	4,339		
1988	5,770		0	562	6,332		
1989	7,655		0	589	8,245		
1990	8,847		0	1,031	9,878		
1991	15,514	564	223	285	16,585		
1992	11,302		1	458	11,761		
1993	3,762	479		412	4,653		
1994	8,366	1		551	8,917	120,000	7%
1995	7,920	50		499	8,468	100,000	8%
1996	13,345	1,295		1,088	15,728	105,500	15%
1997	13,927	628		847	15,403	90,000	17%
1998	12,095	571	1,363	495	14,525	80,000	18%
1999	11,181	99		752	12,031	75,000	16%
2000	4,551	736		362	5,649	75,000	8%
2001	584	11,396		360	12,340	85,000	15%
2002	4,008	11,669	10,477	376	26,530	85,000	31%
2003	5,291	17,212	11,572	222	34,298	175,000	20%
2004	5,884	23,170	20,499	5,440	54,993	170,000	32%
2005	5,437	8,410	18,894	9,468	42,209	115,000	37%
2006	10,349	24,413	19,360	2,519	56,640	115,000	49%

Source: Unpublished NMFS dealer weighout data.

Figure 2 Annual U.S. Commercial Atlantic Mackerel Landings (mt) 1982-2006

Source: Unpublished NMFS dealer weighout data.

4.2.2 2007 Fishery Data

To begin to evaluate the extent to which there may be a problem with herring bycatch on non-permitted mackerel vessels, permit data were queried for all vessels that reported landings of Atlantic mackerel in logbooks during the 2007 fishing year. 2007 was the year during which Amendment 1 to the Herring FMP was implemented, including the limited access permit program. However, it should be noted that Amendment 1 did not become effective until June 1, 2007, after the majority of the 2007 mackerel fishery season had already occurred (Jan-April).

Table 10 summarizes the Amendment 1 (herring) permit category and the average herring landings for vessels that participated in the mackerel fishery during 2007, based on vessel trip reports (VTRs). Note that since Amendment 1 to the Herring FMP was not implemented until June 1, 2007, there are three vessels with no herring permits in 2007 (they possessed open access permits for herring prior to the implementation of the Amendment 1 limited access permit program). Herring landings were insignificant and mackerel landings were less than 1,000 mt for these vessels during 2007.

According to Table 10, every vessel that landed more than 1,000 mt of Atlantic mackerel during 2007 qualified for and obtained a limited access directed fishery permit to fish in all management areas for herring (Category A). These vessels are therefore allowed to fish for and land herring in unrestricted amounts until a TAC is reached in a management area and the area closes. All other vessels with mackerel landings (71) reported less than 1,000 mt total for the fishing year.

Thirteen of these vessels qualified for an unrestricted herring limited access permit for all areas (Category A), two qualified for unrestricted limited access permits in Areas 2/3 only (Category B), and two qualified for limited access incidental catch permits with a 25 mt possession limit restriction. There were 51 vessels that reported mackerel landings in 2007 that did not qualify for a limited access permit but obtained the open access incidental catch permit with an associated herring possession limit of 3 mt. These 51 vessels averaged 17 mt of herring landings total during the 2007 fishing year. It is important to keep in mind that this analysis considers activity during the 2007 fishing year only, and 2007 saw a substantial reduction in the Atlantic mackerel fishery (see Section II of this document for additional information).

Table 10 Amendment 1 Permit Category for Vessels with Reported Mackerel Landings in 2007

2007 Mackerel Landings		Herring Permit Category					Total
		A	B	C	D	None	
< 1,000 mt	Number of Vessels	13	2	2	51	3	71
	Avg 2007 Herring Landings (mt)	2,043	Cannot report	Cannot report	17	0	401
1,000 - 2,000 mt	Number of Vessels	8					8
	Avg 2007 Herring Landings (mt)	2,119					2,119
2,000 - 4,000 mt	Number of Vessels	5					5
	Avg 2007 Herring Landings (mt)	3,395					3,395
Total number of vessels		26	2	2	51	3	84
Overall Avg 2007 Herring Landings (mt)		2,326	Cannot report	Cannot report	17	0	743

The Amendment 1 limited access permit program was implemented on June 1, 2007.

Herring permit data were also queried to characterize the location of the vessels that reported Atlantic mackerel landings in their logbooks during 2007 (Table 11). Table 11 describes the same set of vessels that are described above in Table 10. The majority of Category A mackerel vessels (limited access herring permits for all management areas) are homeported in Massachusetts, New Jersey, and Rhode Island. The majority of Category D mackerel vessels (open access herring permit for 3 mt) are homeported in New Jersey, New York, and Rhode Island, which is consistent with trends in participation and activity in the Atlantic mackerel fishery. It is likely that the Category D vessels from NY, NJ, and RI are some of the vessels for which there may be concern about potential herring bycatch, especially if their activity in the mackerel fishery increases.

Table 11 Amendment 1 Permit Category and Home Port State for Vessels with Reported Mackerel Landings in 2007

Home Port State	Herring Permit Category					
	A	B	C	D	None	Total
CT				3		3
MA	12			6	1	19
ME	1			2		3
NC	1			2		3
NE	1					1
NH	2				1	3
NJ	5			7		12
NY				17	1	18
RI	4	2	2	14		22
Total	26	2	2	51	3	84

The Amendment 1 limited access permit program was implemented on June 1, 2007.

Observer data from 2007 also were queried to see the extent to which vessels fishing without a limited access herring permit may be discarding herring (primarily Atlantic mackerel vessels). Of all the observed trips which landed and/or discarded herring or mackerel, there were only two trips by vessels without a limited access herring permit in 2007. In neither case were herring discards larger than a couple hundred pounds. However, with so few observations, little can be drawn in the way of conclusions from this data set.

2007 Landings from Bottom Trawls in Area 2

During the 2007 fishing year, a total of 19,535 metric tons of Atlantic herring were landed from Area 2. Table 12 characterizes the Area 2 landings by gear type. In 2007, bottom trawl gear accounted for 36% of the herring landings from Area 2 (7,009 mt). This is a significant increase over 2005 and 2006 levels, which were approximately 1,500 metric tons. However, it is important to note that about one half of the 7,009 metric tons Area 2 bottom trawl landings are from one vessel. For data confidentiality reasons, details about this vessel cannot be reported.

Table 13 characterizes the 2007 Area 2 bottom trawl landings by the remaining 60 bottom trawl vessels, which landed 3,415 mt, based on vessel trip report (VTR) data. Table 13 breaks out the number of vessels that landed less than 10 mt of herring and those that landed greater than 50 mt of herring by State landed. Included in the count of vessels that landed greater than 50 mt of herring are seven (7) vessels that landed greater than 100 mt of herring during 2007. The majority of the bottom trawl vessels are landing small quantities of herring (less than 10 mt total in 2007), suggesting that the herring may be incidental catch while fishing in Area 2 for other species.

The majority of Area 2 herring landings from bottom trawl trips occur in New Jersey and Rhode Island. While some vessels land in more than one port (this is why the total vessel count in Table 13 is 63 versus the overall vessel count of 60), the vessel counts of 19 for New Jersey and 10 for Rhode Island are unique to these ports.

Of the 3,429 metric tons of herring landed by the bottom trawl vessels described in Table 13, 2,763 mt (81%) were landed by seven vessels with Category A limited access permits and two vessels with Category B limited access permits. Three Category C limited access vessels landed a total of 357 metric tons, but two of these vessels landed less than 5 mt each. Of the Category D (open access) permit holders, 38 accounted for the remaining 124 mt of Area 2 bottom trawl landings of herring during the 2007 fishing year. Nearly all of the Category D landings from this group appear to be incidental catch, since the amount landed per vessel was less than 10 metric tons. Landings by 11 vessels with no herring permit totaled 185 metric tons. Two of these vessels landed greater than 50 metric tons during 2007, while the remaining vessels landed less than 10 mt each.

With the exception of one vessel, all of the seven Category A bottom trawl vessels with Area 2 landings landed greater than 50 mt during the 2007 fishing year and appear to have been directing on Atlantic herring. Landings by four of these vessels range from 250 mt to 1,000 mt, with one vessel landing greater than 3,500 mt (as mentioned above). Two of these vessels also had significant Area 2 landings using midwater trawl gear, so it is unclear whether or not they were actually fishing for herring with bottom trawls. One of these two vessels also had significant landings from Area 1A using purse seine gear.

The majority of trips on which Atlantic herring is landed by Category A and B bottom trawl gear fishing in Area 2 are considered directed herring trips. Atlantic mackerel are landed on some of these trips, and loligo squid was landed on some of the other trips.

Table 12 2007 Area 2 Landings by Gear Type

Gear Type	Herring Landed (mt)
Midwater Trawl	2,589
Paired Midwater Trawl	9,934
Bottom Trawl	7,009
Other	3
Total	19,535

Table 13 2007 Area 2 Bottom Trawl Herring Landings by State Landed (one vessel with > 3,500 mt landings excluded)

State Landed	Herring Landed (mt)	Number of Vessels Landing Herring	Number of Vessels Landing < 10 Metric Tons	Number of Vessels Landing > 50 Metric Tons
CT	13	3	3	0
MA	79	4	3	1
MD	cannot report	1	cannot report	cannot report
NC	cannot report	1	cannot report	cannot report
NJ	1,369	19	15	4
State UNK	5	6	6	0
NY	89	19	18	1
RI	1,861	10	5	5
VA	cannot report	1	cannot report	cannot report
Total	3,429	63		

Source: Vessel Trip Reports.

4.2.3 2008 Fishery Data

The industry has suggested that the 2007 mackerel fishery was different than previous years in that the mackerel were located offshore, and opportunities were consequently reduced for smaller and mid-sized boats, which are the boats of particular concern with respect to potential herring bycatch. Preliminary 2007 landings data do suggest that activity in the mackerel fishery was substantially lower than previous years. The industry maintains that the shift in the distribution of mackerel to offshore areas precluded smaller vessels from participating in the mackerel fishery. Some of these smaller boats did not qualify for a limited access herring permit; without a permit that allows them to retain any herring they may catch and with reduced opportunities inshore, many of these vessels did not fish for mackerel during the 2007 fishing year. It was noted during several Herring Committee/Advisory Panel discussions of this issue that many vessels are so concerned about being found in violation of the possession limit that they are not taking the risk and fishing for mackerel. Some industry members suggested that the fishery has shifted again during 2008 and that available information for the 2008 fishing year should be investigated to better characterize mixing and overlap between the two fisheries.

4.2.3.1 Permit and Monthly/Annual-Level Data for 2008

To begin to evaluate the extent to which there may be a problem with herring bycatch on mackerel vessels, permit data were queried for all vessels that reported landings of Atlantic mackerel in logbooks during the 2008 fishing year. Since Amendment 1 was implemented on June 1, 2007 and the Atlantic mackerel fishery occurs primarily from December through April, 2008 is the first year in which a full mackerel season occurred while under Amendment 1 regulations. This year is used to provide some perspective on recent activity in the Atlantic

mackerel fishery, including activity by vessels that may not have qualified for herring limited access permits.

The 2008 data are preliminary, so all trips may not have been entered into the database, and fishing activity during December has obviously not occurred. Table 14 reports the total landings of herring and mackerel by month through July 2008.

Table 14 2008 Monthly Landings of Atlantic Herring and Mackerel Through July 2008

January 2008	Herring landed (mt)	7,105
	Mackerel landed (mt)	11,539
February 2008	Herring landed (mt)	7,897
	Mackerel landed (mt)	2,442
March 2008	Herring landed (mt)	3,441
	Mackerel landed (mt)	2,513
April 2008	Herring landed (mt)	2,922
	Mackerel landed (mt)	5,511
May 2008	Herring landed (mt)	4,179
	Mackerel landed (mt)	27
June 2008	Herring landed (mt)	5,473
	Mackerel landed (mt)	13
July 2008	Herring landed (mt)	6,143
	Mackerel landed (mt)	1
Total	Herring landed (mt)	37,160
	Mackerel landed (mt)	22,047

Table 15 summarizes the 2008 herring permit category and the average herring landings for vessels that participated in the mackerel fishery during 2008, based on vessel trip reports (VTRs). According to Table 15, every vessel that landed more than 1,000 mt of Atlantic mackerel during 2008 qualified for and obtained a limited access directed fishery permit to fish in all management areas for herring (Category A). These vessels are therefore allowed to fish for and land herring in unrestricted amounts until a TAC is reached in a management area and the area closes. All other vessels with mackerel landings (183) reported less than 1,000 mt total for the fishing year. Nine of these vessels qualified for an unrestricted herring limited access permit for all areas (Category A), three qualified for unrestricted limited access permits in Areas 2/3 only (Category B), and 10 vessels qualified for limited access incidental catch permits with a 25 mt possession limit restriction.

There were 128 Category D vessels that reported mackerel landings during the 2008 fishing year to date; these vessels did not qualify for a limited access permit but obtained the open access incidental catch permit with an associated herring possession limit of 3 mt. While it is possible that some individual trips may have encountered larger amounts of herring, the Category D vessels landed one (1) metric ton of herring, on average, in 2008. It is important to keep in mind

that this analysis considers activity during the 2008 fishing year through July 2008 only, and there is likely to be additional fishing activity in the mackerel fishery towards the end of the year (December).

Table 15 Amendment 1 Permit Category for Vessels with Reported Mackerel Landings in 2008

2008 Mackerel Landings		2008 Herring Permit Category					
		A	B	C	D	None	Total
< 1,000 mt	Number of Vessels	9	3	10	128	33	183
	Avg 2007 Herring Landings (mt)	2,166	266	0	1	0	398
1,000 - 2,000 mt	Number of Vessels	7					7
	Avg 2007 Herring Landings (mt)	989					989
2,000 - 4,000 mt	Number of Vessels	3					3
	Avg 2007 Herring Landings (mt)	1,163					1,163
Total number of vessels		19	3	10	128	33	193
Overall Avg 2007 Herring Landings (mt)		1,541	266	0	1	0	515

NMFS permit data were queried to characterize the location and average length of all vessels with herring permits (Table 16). The average length of category C vessels (62 feet) and Category D vessels (47 feet) is quite a bit smaller than the vessels with limited access directed fishery permits. This is consistent with the industry's claims that the open access permit holders are dominated by smaller and mid-sized vessels; if the mackerel did in fact move offshore during 2007, these vessels may have experienced reductions in their fishing opportunities. The 2008 data summarized in Sections 4.2.3.1 and 4.2.3.2 of this document (below) do not suggest that mackerel fishing activity by this group of vessels has increased substantially during the 2008 fishing year.

Table 17 reports the average length and principal port state of the vessels which landed mackerel in 2008. The majority of Category A mackerel vessels (limited access herring permits for all management areas) have principal ports in Massachusetts, and New Jersey. The majority of Category D mackerel vessels (open access herring permit for 3 mt) have principal ports in New Jersey, New York, and Rhode Island, which is consistent with trends in participation and activity in the Atlantic mackerel fishery. It is likely that the Category D vessels from NY, NJ, and RI are some of the vessels for which there may be concern about potential herring bycatch, especially if their activity in the mackerel fishery increases in the future.

Table 16 2008 Herring Permit Category and Principal Port State

Principal Port State		2008 Herring Permit Category				
		A	B	C	D	Total
AK	Number of vessels				2	2
	Average length				139	139
CT	Number of vessels			2	41	43
	Average length			83	53	54
DE	Number of vessels				20	20
	Average length				41	41
FL	Number of vessels				13	13
	Average length				50	50
GA	Number of vessels				2	2
	Average length				68	68
LA	Number of vessels				1	1
	Average length				75	75
MA	Number of vessels	17		6	816	839
	Average length	111		67	46	47
MD	Number of vessels				34	34
	Average length				55	55
ME	Number of vessels	10		9	307	326
	Average length	78		48	37	38
NC	Number of vessels			3	82	85
	Average length			75	64	65
NH	Number of vessels	2		6	111	119
	Average length	122		46	36	38
NJ	Number of vessels	6		7	341	354
	Average length	91		75	54	55
NY	Number of vessels			2	213	215
	Average length			72	44	44
PA	Number of vessels				2	2
	Average length				55	55
RI	Number of vessels	5	4	7	145	161
	Average length	96	70	61	51	53
SC	Number of vessels				1	1
	Average length				33	33
TX	Number of vessels				2	2
	Average length				64	64
VA	Number of vessels	1			86	87
	Average length	80			64	65
Total	Number of vessels	41	4	42	2,219	2,306
	Average length	98	70	62	47	48

Table 17 2008 Herring Permit Category and Principal Port State (Vessels with Mackerel Landings)

Principal Port State		2008 Herring Permit Category					Total
		None	A	B	C	D	
CT	Number of vessels					4	4
	Average length					87	87
MA	Number of vessels	4	8		1	20	33
	Average length	43	126		57	44	64
MD	Number of vessels	1					1
	Average length	44					44
ME	Number of vessels	6	2			3	11
	Average length	35	105			30	46
NC	Number of vessels					2	2
	Average length					66	66
NH	Number of vessels	5	2			2	9
	Average length	53	122			49	67
NJ	Number of vessels	4	4		1	29	38
	Average length	52	102		75	56	61
NY	Number of vessels	2			3	37	42
	Average length	33			73	59	59
RI	Number of vessels	3	3	3	5	30	44
	Average length	40	114	68	62	64	66
VA	Number of vessels	1				1	2
	Average length	40				74	57
No Federal Permit	Number of vessels	7					7
	Average length						
Total	Number of vessels	33	19	3	10	128	193
	Average length	43	116	68	66	58	62

4.2.3.2 Trip-Level Data for 2008

Since vessels with any type of herring permit (including Category C and D) are required to submit vessel trip reports (which should include the reporting of discards), logbook data were queried to find all trips where either herring or mackerel was reported as landed or discarded in 2008. Table 18 summarizes the 2008 logbook data by categorizing trips according to mackerel landings and permit type. The reason for creating the mackerel landings categories in Table 18 is to characterize the proportion of current trips that may be approaching the trip limits specified by the Category C and D herring permits. Information for Categories A and B is shown for purposes of comparison.

As shown in Table 18, all of the trips greater than 100 metric tons of mackerel were landed by vessels with Category A herring permits. Vessels with Category B, C, or D permits landed less than 100 metric tons – many with no mackerel landings. Of the 35 Category C trips in the less than 100 metric ton mackerel landing category, the average amount of herring landed is very small, and the average herring discards are zero. A similar scenario holds for the 530 Category

D trips and the 154 trips by vessels with no herring permit. This indicates that the Category C and D vessels did not encounter large amounts of herring while fishing for mackerel (or encountering both herring and mackerel while fishing for something else) during the 2008 fishing year (to date). Had the average herring landings on the Category C trips been at the 25 metric ton level, or the herring landings on the Category D trips been at the 3 metric ton level, and/or high levels of herring discards, this would have provided clear evidence that these vessels were reaching their respective trip limits.

However, as indicated by industry representatives, some vessels may have chosen not to make a mackerel trip at all because they thought it would be difficult to remain under the trip limit. This type of information would not be revealed by an examination of the logbook data. An indication that this may be occurring is shown through the decrease in Atlantic mackerel landings by Category C and D vessels relative to the overall recent decline in mackerel landings. Category C and D mackerel landings dropped by 85% between 2006 and 2008, whereas overall mackerel landings dropped by 63.5%.

Table 19 reflects the same data that is embedded in Table 18 but it is displayed by categories of herring landings rather than categories of mackerel landings. The relevant landings range to consider for Category C permit holders is 30,000 to 55,000 pounds. The data in Table 19 show that there have been no trips reported in that range during the 2008 fishing year. If there had been many trips with average landings approaching 55,000 pounds and high herring discards reported, this would have indicated that Category C vessels were reaching the possession limit and being forced to discard.

For open access permit holders (Category D, 3 mt), there has only been one trip reported in the 3,300-6,600 pound range and one trip in the 6,600 to 30,000 pound range during 2008 (which exceeded the 3 mt trip limit). This suggests that at least for trips taken by Category D vessels, very few have reported landings of herring greater than 50% of the current possession limit. For the 748 trips with herring landings that were less than 50% of the 3 mt trip limit (0 to 3,300 pounds), the average herring landings reported by these vessels are only 50 pounds, and average herring discards reported are only 22 pounds.

Table 18 2008 Herring Landings and Discards by Permit Category and Mackerel Landings Category (All Logbook Trips with Herring or Mackerel Catch)

Mackerel Landings Category		2008 Herring Permit					
		A	B	C	D	None	Total
No landings	Number of trips	233	27	34	220	51	565
	Average herring landed (mt)	119	17	0.148	0.055	1	50
	Average herring discarded (mt)	0	17	0.003	0.061	0.008	1
	Maximum herring discarded (mt)	0	446	0.017	6.250	0.179	446
Less than 100 mt	Number of trips	85	4	35	530	154	808
	Average herring landed (mt)	80	13	0.005	0.025	0.005	8
	Average herring discarded (mt)	0	0	0	0	0.0001	0.011
	Maximum herring discarded (mt)	4	0	0	0	0.0112	4.464
100 to 200 mt	Number of trips	30					30
	Average herring landed (mt)	55					55
	Average herring discarded (mt)	0					0
	Maximum herring discarded (mt)	0					0
200 to 300 mt	Number of trips	17					17
	Average herring landed (mt)	5					5
	Average herring discarded (mt)	0					0
	Maximum herring discarded (mt)	0					0
300 to 400 mt	Number of trips	15					15
	Average herring landed (mt)	20					20
	Average herring discarded (mt)	2					2
	Maximum herring discarded (mt)	18					18
400 to 500 mt	Number of trips	11					11
	Average herring landed (mt)	3					3
	Average herring discarded (mt)	0					0
	Maximum herring discarded (mt)	0					0
Total	Number of trips	391	31	69	750	205	1,446
	Average herring landed (mt)	93	17	0.076	0.033	0.314	26
	Average herring discarded (mt)	0.108	14	0.001	0.018	0.002	0.348
	Maximum herring discarded (mt)	18	446	0.017	6	0.179	446

Table 19 2008 Herring Landings and Discards by Herring Landing Category

Herring Landings Category		2008 Herring Permit					
		A	B	C	D	None	Total
0 to 3,300 lbs	Number of trips	96	3	69	748	204	1,120
	Average herring landed (lbs)	52	0	169	50	21	52
	Average herring discarded (lbs)	531	333,333	3	22	5	954
	Maximum herring discarded (lbs)	35,000	1,000,000	38	10,000	400	1,000,000
	Average mackerel landed (lbs)	342,565	84	174	922	136	30,014
3,300 to 6,600 lbs	Number of trips	1	1		1		3
	Average herring landed (lbs)	6,000	5,000		5,000		5,333
	Average herring discarded (lbs)	0	0		0		0
	Maximum herring discarded (lbs)	0	0		0		0
	Average mackerel landed (lbs)	420,000	0		400		140,133
6,600 to 30,000 lbs	Number of trips	11	8		1		20
	Average herring landed (lbs)	18,884	14,500		14,000		16,886
	Average herring discarded (lbs)	0	0		14,000		700
	Maximum herring discarded (lbs)	0	0		14,000		14,000
	Average mackerel landed (lbs)	199,327	0		0		109,630
30,000 to 55,000 lbs	Number of trips	25	11				36
	Average herring landed (lbs)	45,859	42,636				44,874
	Average herring discarded (lbs)	0	0				0
	Maximum herring discarded (lbs)	0	0				0
	Average mackerel landed (lbs)	148,536	182				103,205
55,000 to 75,000 lbs	Number of trips	10	5				15
	Average herring landed (lbs)	64,300	66,400				65,000
	Average herring discarded (lbs)	0	0				0
	Maximum herring discarded (lbs)	0	0				0
	Average mackerel landed (lbs)	0	0				0
75,000+	Number of trips	248	3			1	252
	Average herring landed (lbs)	321,964	83,333			140,000	318,402
	Average herring discarded (lbs)	177	0			0	175
	Maximum herring discarded (lbs)	40,000	0			0	40,000
	Average mackerel landed (lbs)	38,064	400			0	37,464
Total	Number of trips	391	31	69	750	205	1,446
	Average herring landed (lbs)	209,349	37,806	169	75	704	57,565
	Average herring discarded (lbs)	243	32,258	3	40	5	779
	Maximum herring discarded (lbs)	40,000	1,000,000	38	14,000	400	1,000,000
	Average mackerel landed (lbs)	124,430	111	174	920	135	34,153

4.2.4 Fishery Information Considered in Amendment 1 to the Herring FMP

During the development of the limited access alternatives in Amendment 1, the Herring PDT examined vessel logbook data from 2000 to 2002 to show how many trips may be affected by trip limits of 15 and 25 metric tons, which were considered as part of the incidental catch permit options. The following information is useful to illustrate the overlap between the herring fishery and other small mesh (whiting) and pelagic fisheries (squid, mackerel) occurring throughout the region. This information provides a somewhat more historical perspective on the nature and degree of overlap between the herring fishery and other small mesh fisheries.

In Table 20 – Table 22, incidental herring landings are summarized for directed mackerel, squid (loligo and illex combined), and whiting trips. In the following analysis, a *directed* trip is defined as one in which 50% or more of the landings consisted of the species in question. For the Atlantic mackerel trips, only trips with more than 1 metric ton were included in the analysis.

Table 20 shows that in 2002, nine (9) of the 254 directed mackerel trips greater than 1 mt had greater than 25 mt of herring landed on the same trip. No directed mackerel trips landed between 15 and 25 metric tons of herring, and six (6) trips landed between 0 and 15 mt of incidental herring landings during 2002. In 2001, nearly all directed mackerel trips landed no herring with the exception of three (3) trips that landed between 0 and 1 mt of herring. In 2000, three (3) of the 95 directed mackerel trips greater than 1 mt landed greater than 25 mt of herring on the same trip. No directed mackerel trips landed between 15 and 25 mt of herring, and two (2) trips had between 0 and 15 mt of incidental herring landings during 2000. Therefore, at the time this analysis was conducted, the incidental catch of herring on directed mackerel trips appeared to be low. It was noted that this issue may become more of a concern if/when the Atlantic mackerel fishery expands beyond levels observed in the early 2000s.

Table 21 shows that for the directed squid trips, there were only three (3) trips in 2000 in which more than 25 mt of herring was landed. The rest of the directed squid trips during that year as well as all directed squid trips in 2001 and 2002 landed less than 15 mt of herring. Most directed squid trips landed no amount of herring. The trips that did land herring landed less than 600 pounds of herring.

Table 22 shows that all for all the directed whiting trips in 2000 to 2002, none had greater than 15 metric tons of incidental herring landings. Most directed whiting trips had no herring landings. The trips that did land herring landed less than 1.4 mt of herring.

Table 20 Incidental Catch of Herring on Directed Mackerel Trips

	2000	2001	2002
Number of directed trips with greater than 1 mt of mackerel	95	122	254
Number of trips with herring catch > 0 and < 15 mt	2	3 (maximum of 1 mt of herring)	6
Number of trips with herring catch between 15 and 25 mt	0	0	0
Number of trips with herring catch > 25	3 (maximum of 120 mt of herring)	0	9 (maximum of 109 mt of herring)

Table 21 Incidental Catch of Herring on Directed Squid (Loligo and Illex Combined) Trips

	2000	2001	2002
Number of directed trips	5,624	3,394	3,377
Number of trips with herring catch > 0 and < 15 mt	32 (maximum of 400 LBS)	26 (maximum of 500 LBS)	8 (maximum of 600 LBS)
Number of trips with herring catch between 15 and 25 mt	0	0	0
Number of trips with herring catch > = 25	3 (maximum of 36 mt)	0	0

Table 22 Incidental Catch of Herring on Directed Whiting Trips

	2000	2001	2002
Number of directed trips	1,777	1,933	1,131
Number of trips with herring catch > 0 and < 15 mt	52 (maximum of 1 mt)	76 (maximum of 625 LBS)	68 (maximum of 1.4 mt)
Number of trips with herring catch between 15 and 25 mt	0	0	0
Number of trips with herring catch > = 25	0	0	0

5.0 MEASURES TO ADDRESS INTERACTIONS WITH RIVER HERRING AND MINIMIZE RIVER HERRING BYCATCH

At the September 30/October 1, 2008 Herring Committee meeting, the Committee received a presentation summarizing a recent report prepared for the ASMFC river herring stock assessment regarding the bycatch of river herring (blueback herring, alewife) in the Atlantic herring fishery. While the report highlighted the variability associated with the data and the resulting bycatch estimates, it does show that river herring is caught as bycatch in the Atlantic herring fishery, particularly seasonally in certain areas. Some Committee members expressed concern about the declining status of the river herring resource and felt that management action should be taken to try to protect the important runs in the southern area. While the data are clearly limited, the Committee acknowledged that mortality is occurring and suggested that management action should be considered to prevent further declines. As a result, the Committee passed the following motions:

- (1) That the Council request that the Herring PDT craft alternatives for time/area closures to protect the SNE/MA runs of river herring (including Cape Cod area)
- (2) That the Council collaborate as much as possible with ASMFC and the MA Council regarding the management of the river herring resource

The Council unanimously approved the same motions at its October 7-9, 2008 meeting.

Since that time, the Herring PDT has been reviewing and further analyzing available observer and other bycatch data. The data are limited and quite variable, however, and the PDT's work on this issue is not yet complete. The PDT will discuss this issue further and work towards providing a report that responds to the Council directive to develop management alternatives to address this issue in Amendment 4.

6.0 MEASURES TO ADDRESS HERRING VESSEL ACCESS TO GROUND FISH CLOSED AREAS

At the November 18-20, 2008 New England Fishery Management Council meeting, the Council approved the following two motions:

“That the Council request NMFS review recent herring midwater trawling observer data from groundfish Closed Area I to determine if Council requirements for continued access have been met. If criteria have not been met, access should be prohibited.”

And...

“To include criteria for midwater trawler access to groundfish closed areas in the list of 2009 herring management actions.”

The Herring Committee discussion on December 16, 2008, was general and preliminary, and focused primarily on the second motion and the alternatives that may be considered in Amendment 4 to establish criteria for midwater trawl access to groundfish closed areas. The Herring Committee discussed the Council’s motion and provided additional details and guidance so that more specific measures can be developed. Some questions the Committee considered during the discussion included:

- What specific kinds of criteria should be considered in Amendment 4 for allowing or prohibiting midwater trawl access to groundfish closed areas?
- To which groundfish closed areas would these criteria apply?
- How would the closed area access criteria and the associated review process be structured? For example, would Amendment 4 prohibit midwater trawl access to the groundfish closed areas and establish criteria and a process to evaluate whether access should be granted in the future? Or, would Amendment 4 continue to allow access to the closed areas and establish criteria that would prohibit access in the future, once a review occurs?
- How would the process for reviewing these criteria be structured? Who would be responsible for evaluating the criteria and determining the appropriate course of action regarding midwater trawl access to the closed areas?
- How often would the review process occur, and what management action(s) would be required to modify either the criteria or provisions for access to the groundfish closed areas? Would Council action be required to allow/prohibit access to the closed areas, or would NMFS be responsible for the review and any related management adjustments?

The Committee developed a general approach to be included in at least one alternative for consideration in this amendment. In addition, two alternatives have been proposed by the Herring Alliance and included by the Committee for further discussion/development. Under both alternatives proposed by the Herring Alliance (described in the subsections below), access to closed areas by midwater trawl vessels (single or paired) would be prohibited except with an experimental fishing permit (EFP) meeting specific requirements. Future access without an EFP

along with minimum criteria for access may be reconsidered and established through a framework action after consideration of the data obtained through any EFPs.

6.1 ALTERNATIVES UNDER CONSIDERATION (NEEDS MORE WORK)

6.1.1 Alternative 1 (Herring Committee)

At its December 16, 2008 meeting, the Herring Committee passed the following motion, which will form the basis of at least one alternative developed in Amendment 4 to address this issue (the Committee agreed that additional alternatives may be developed):

That if, on any given trip, a vessel targeting herring in a groundfish closed area has regulated groundfish exceeding 1% of the catch of herring, that vessel will be required to have 100% observer coverage for one year as a condition to gain further access to the closed areas. If the 1% bycatch allowance is exceeded again, that vessel would be denied access for one year.

XXX

6.1.2 Alternative 2 (Herring Alliance)

Under this alternative, access to groundfish closed areas by midwater trawl vessels (single or paired) would be prohibited except with an experimental fishing permit (EFP) meeting the following requirements:

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

- Other groundfish – Regional Administrator determines bycatch to be 0.5% of TAC for stock – one year exclusion

6.1.3 Alternative 3 (Herring Alliance)

Under this alternative, access to groundfish closed areas by midwater trawl vessels (single or paired) would be prohibited except with an experimental fishing permit (EFP) meeting the following requirements:

- Full observer coverage (one or more observers per vessel, as necessary to ensure that every haul is observed)
- Electronic monitoring systems to augment observer data
 - Tow characteristics (total catch, GPS, height of foot-rope)
 - Video record of catch pre-sorted on deck for observer analysis
- Monitoring protocols including mandatory reporting of vessel electronics information and shoreside gear inspections to determine depth fished by midwater trawl gear and whether contact with the bottom has occurred

7.0 ADDITIONAL BACKGROUND INFORMATION TO SUPPORT THE DEVELOPMENT OF AMENDMENT 4 MANAGEMENT ALTERNATIVES

7.1 UPDATED STOCK/FISHERY INFORMATION

The following stock/fishery information is updated through the 2007 fishing year, and the 2008 fishing year if possible. The Herring PDT will continue to enhance/update this information throughout the development of Amendment 4; more detailed information will be provided in the Draft EIS for Amendment 4.

7.1.1 Stock Information

7.1.1.1 NMFS Trawl Survey – All Strata

Table 23 summarizes data (mean weight per tow in kilograms and mean number per tow) from the NMFS spring and autumn bottom trawl surveys from 1990 – 2008. Table 24 summarizes data from the NMFS winter bottom trawl survey from 1992 – 2008.

The NEFSC trawl survey samples the range of the Atlantic herring resource in the U.S. Exclusive Economic Zone (EEZ). The 2007 fall survey numbers were slightly lower, but not substantially different from those seen in 2005 and 2006. The 2007 spring survey numbers dropped from 2006 levels but also are similar to those in 2005. The winter survey increased slightly from 2006 to 2007. Overall, no trend is apparent in any of the surveys in recent years, although the long-term trend over the survey time series has been upwards.

Table 23 NMFS Trawl Survey – Herring Catch Per Tow (Mean Number and Weight in kg), 1990-2008

YEAR	SPRING SURVEY		AUTUMN SURVEY	
	number/tow	kg/tow	number/tow	kg/tow
1990	8.98	0.92	13.98	1.64
1991	25.40	2.29	20.75	2.95
1992	39.30	2.76	56.61	9.25
1993	68.52	7.68	16.81	2.51
1994	35.40	3.88	13.71	2.15
1995	27.57	3.14	125.75	13.12
1996	58.58	3.81	37.65	4.64
1997	64.66	4.08	37.06	4.87
1998	50.62	4.73	20.63	2.84
1999	84.52	9.45	13.52	1.84
2000	32.02	2.80	20.65	3.18
2001	33.72	3.22	25.33	3.69
2002	40.92	2.63	77.99	10.74
2003	19.71	1.87	94.76	6.23
2004	48.00	2.22	40.70	5.04
2005	19.87	1.49	25.70	3.37
2006	27.72	2.89	28.16	3.48
2007	17.34	1.72	22.97	3.17
2008				

Table 24 NMFS Winter Trawl Survey – Herring Catch Per Tow (Mean Number and Weight in kg), 1992-2008

YEAR	WINTER Number/Tow	WINTER KG/Tow
1992	35.42	3.19
1993	49.77	6.56
1994	4.39	0.51
1995	17.60	2.60
1996	112.25	6.86
1997	54.53	8.47
1998	57.29	6.05
1999	56.01	6.77
2000	66.20	3.54
2001	77.09	7.56
2002	74.66	9.45
2003	42.78	4.49
2004	34.26	2.16
2005	98.06	9.08
2006	50.87	4.80
2007	55.26	6.37
2008		

7.1.1.2 NMFS Trawl Survey – Inshore GOM Strata

(Update for 2008)

When examining the inshore Gulf of Maine survey strata separately, the NMFS fall survey and the spring survey were relatively flat, averaging very few fish per tow during the late 1960s through the early 1980s (Figure 3 – Figure 6). In the late 1980s, the indices increased significantly, and although variable, have remained relatively high.

The number of fish per tow from the survey in the inshore Gulf of Maine increased to a record high in the 2004 spring survey. A similar peak was observed in the fall survey in the previous year. Another relatively significant increase in numbers and weight per tow occurred during the fall of 2006, but this was not observed in the spring survey; the following 2007 spring survey increased slightly from very low levels. Throughout the more recent time series, the surveys in the inshore Gulf of Maine have been quite variable, and no trend is apparent. Overall, survey tows in the inshore GOM since 2004 are not as high in number or weight as those observed during the late 1990s and early 2000s. It should be noted that while the fall survey might be construed to represent mostly the Gulf of Maine spawning component, the same cannot be said for the Spring inshore survey.

Figure 3 Herring Catch/Tow (Number) Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore), 1963-2007

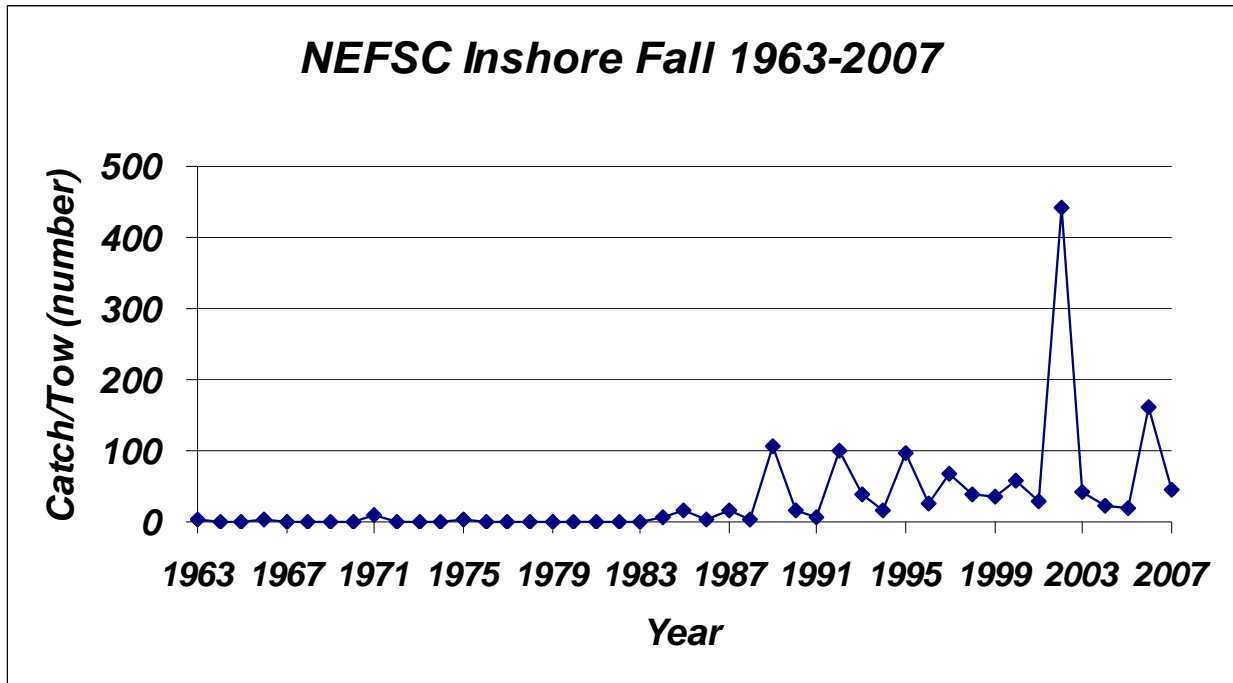


Figure 4 Herring Catch/Tow (Kilograms) Indices from the NMFS Autumn Bottom Trawl Survey Strata 26-27,38-40 (Inshore), 1963-2007

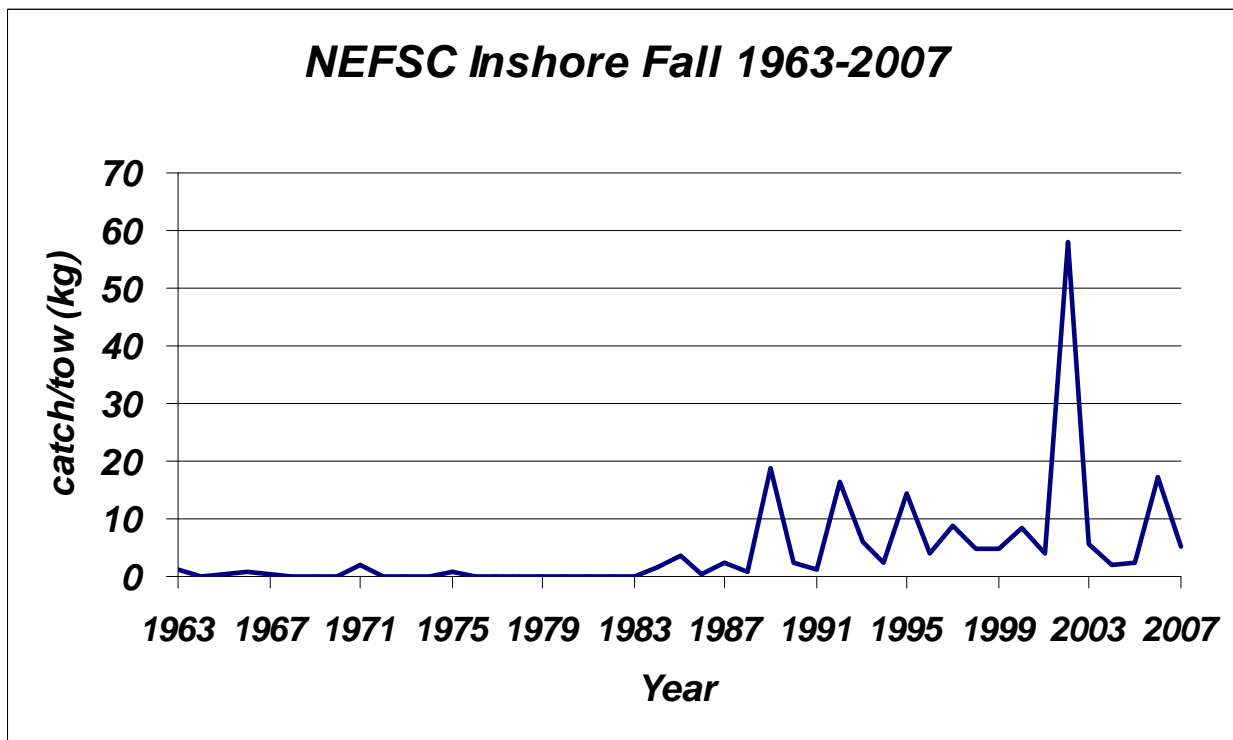


Figure 5 Herring Catch/Tow (Number) Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore), 1968-2007

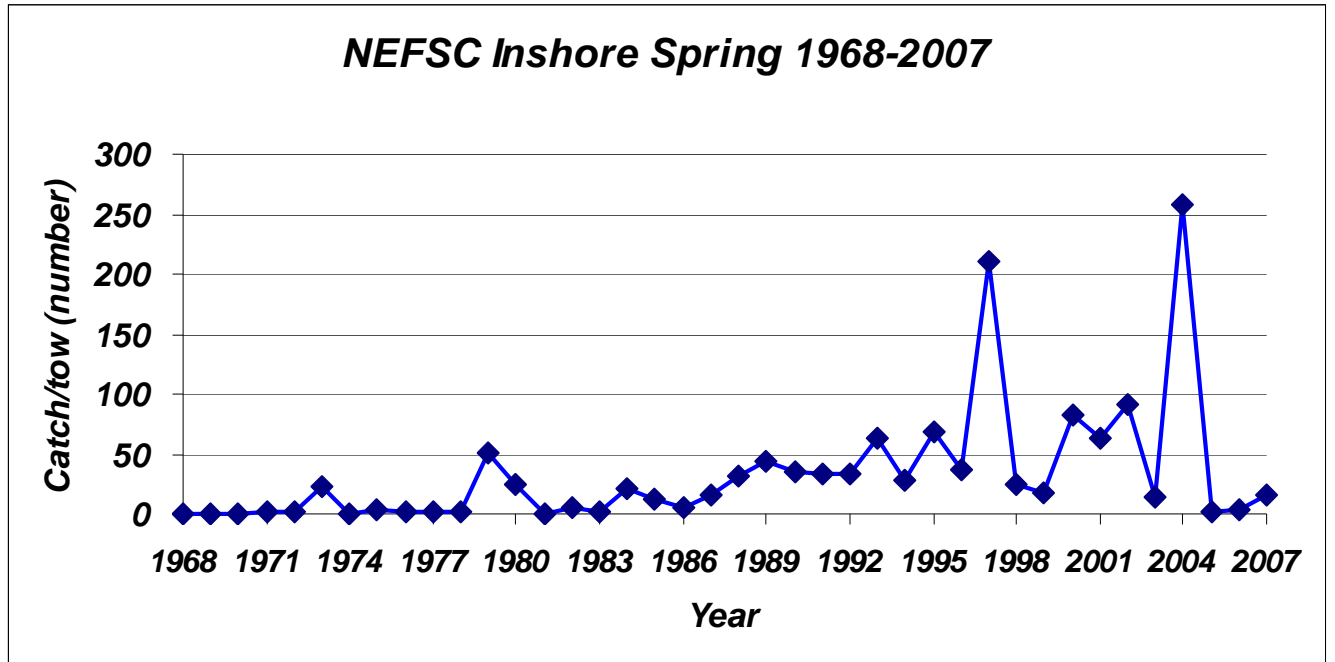
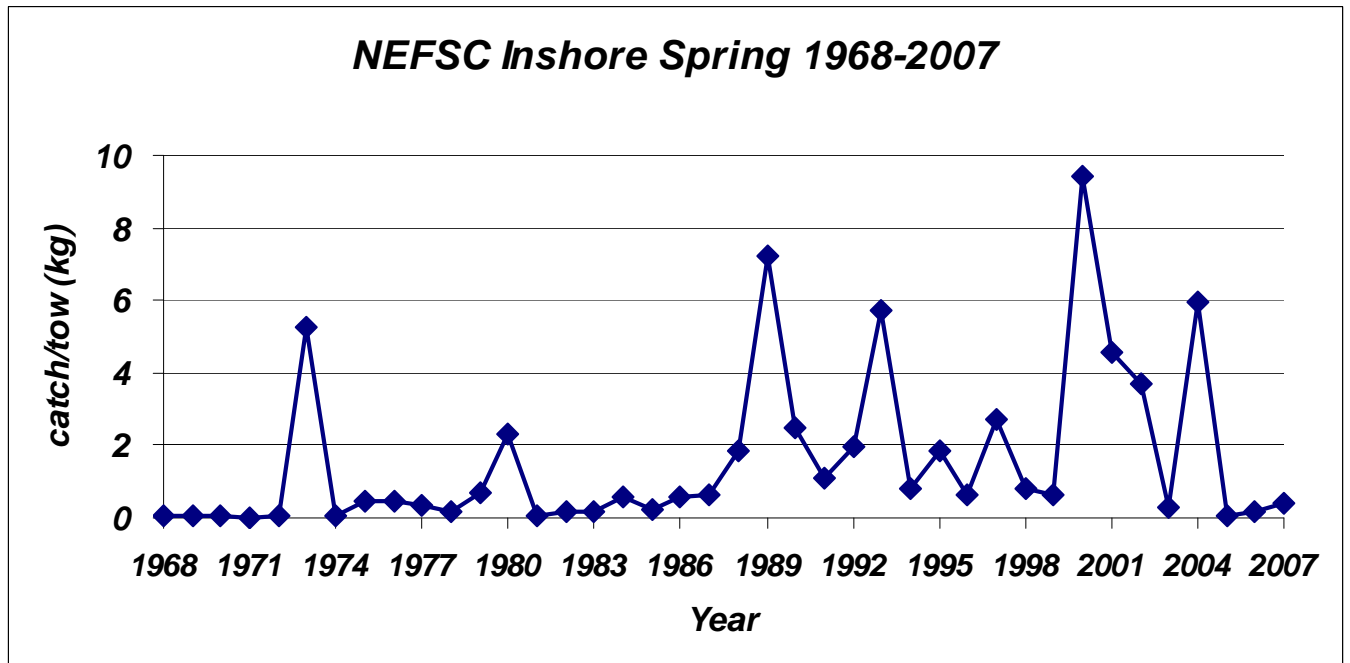


Figure 6 Herring Catch/Tow (Kilograms) Indices from the NMFS Spring Bottom Trawl Survey Strata 26-27,38-40 (Inshore), 1968-2007



7.1.1.3 Stock Assessment Schedule for Atlantic Herring

At this time, the next stock assessment for Atlantic herring is scheduled for June 2009 in Woods Hole, Massachusetts. It will be a joint assessment with Canada, conducted through the Transboundary Resource Assessment Committee (TRAC).

7.1.2 Fishery Information

7.1.2.1 IVR Landings

The main reason for utilizing the interactive voice response (IVR) system in the Atlantic herring fishery is to monitor the Total Allowable Catch (TAC) limits set for the four Federal management areas. As part of the herring FMP, each management area is annually assigned a TAC (in metric tons). Although harvesters are required to also report catches with vessel trip report (VTR) forms, near real-time data is obtained through the IVR system allowing the TACs to be monitored. As of the 2008 fishing year, the 3% research set-aside established in Amendment 1 requires that when the catch in a management area is projected to reach 92% of its specified TAC, the Regional Administrator closes the area to all directed herring fishing. The 2008 fishing year was the eighth year of mandatory IVR reporting for the Atlantic herring fleet.

Table 25 Total Allowable Catches (TACs) for 2008 Fishing Year

Management Area	TAC (mt)	92% of TAC (mt)
Area 1A (Jan 1 st – May 31 st)	5,000	N/A
Area 1A (June 1 st – Dec 31 st)	40,000	N/A
Area 1A TOTAL	45,000	41,400
Area 1B	10,000	9,200
Area 2	30,000	27,600
Area 3	60,000	55,200

Table 26 Total IVR Landings of Atlantic Herring, 2000-2008

Year	Total IVR Landings (MT)
2000	107,387
2001	121,569
2002	91,831
2003	100,544
2004	93,722
2005	96,895
2006	99,185
2007	78,172
2008	80,800

Table 27 provides IVR catches for the 2008 fishing year. Overall, the IVR reports totaled 80,800 mt of herring across all management areas, which represents about 56% of the OY for the U.S. fishery (145,000 mt) . Consistent with previous years, the majority of the landings were taken from Area 1 (1A and 1B). Part of the reduction in total landings since 2006 is attributable to a 15,000 mt decrease in the TAC for Area 1A. Overall, the timing of the fishery appears to have been consistent with previous years (Figure 7). However, fishing effort in Area 1A was distributed over the year in a more step-wise fashion due to adjustments to the days out provisions that are intended to slow the pace of the fishery (Figure 8). In 2008, the Area 1A fishery closed on November 14, 2008.

Table 27 IVR Herring Catch for 2008 Fishing Year

Management Area	IVR Catch (mt)	% of TAC
Area 1A (Jan 1 st – May 31 st)	0	N/A
Area 1A (June 1 st – Dec 31 st)	41,640	N/A
Area 1A TOTAL	41,640	92.5%
Area 1B	8,104	81%
Area 2	19,256	64.2%
Area 3	11,800	19.7%
Total	80,800	55.7%

Figure 7 Cumulative Total Catch of Atlantic Herring in All Management Areas by Week, 2004-2008 (IVRs)

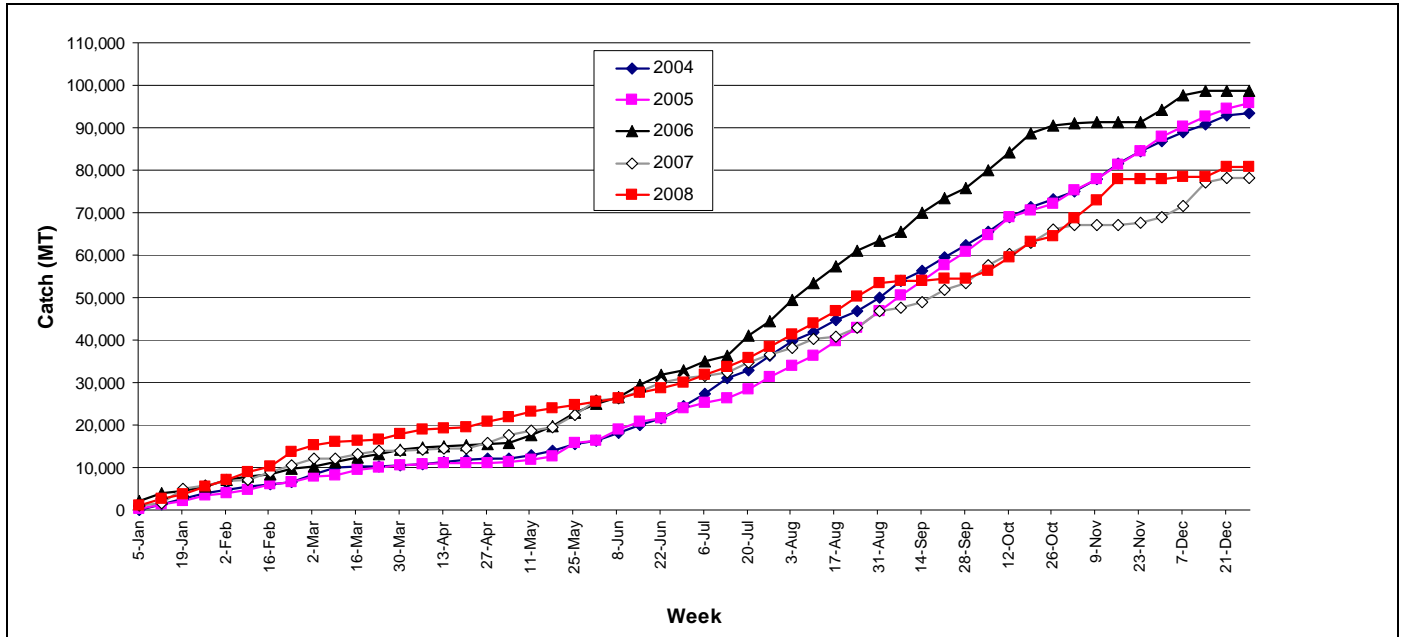


Figure 8 Cumulative Total Catch of Atlantic Herring in Area 1A by Week, 2004-2008 (IVRs)

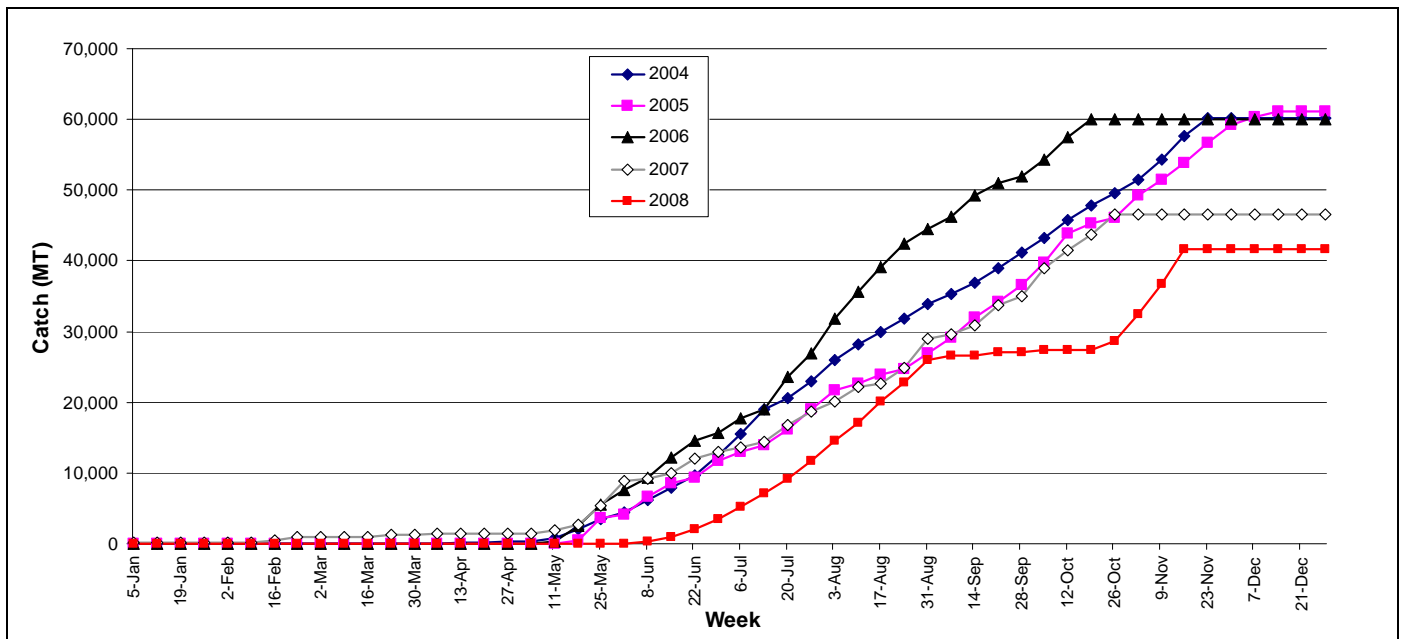


Table 28 shows the differences in IVR-reported herring catch by management area from 2007 to 2008. The decrease in Area 1A catch corresponds with the additional 5,000 mt decrease in the 1A TAC from 50,000 mt in 2007 to 45,000 mt in 2008. Catch from Area 1B increased to compensate, in part, for the catch reduction in Area 1A. The Area 2 fishery increased substantially. Landings from Area 3 increased as well but remain far lower than the 60,000 mt TAC for that area. Overall, landings increased from 2007 to 2008 by 2,628 metric tons (+3.4%) but remain considerably lower than years prior to 2007 and well below the total available OY for the U.S. Atlantic herring fishery.

Table 28 Differences in IVR Herring Catch by Management Area, 2007-2008

Management Area	2007 Catch (mt)	2008 Catch (mt)	Difference (mt)
1A	46,870	41,640	-5,230
1B	6,859	8,104	+1,245
2	14,687	19,256	+4,569
3	9,756	11,800	+2,044
Total	78,172	80,800	+2,628

7.1.2.2 VTR Landings

TBD

7.1.2.3 Economic Factors

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

With the implementation of the limited access permit program in Amendment 1, the following numbers of vessels applied for and received permits in 2007 (estimates provided as of December 2008):

- Category A – 43 vessels;
- Category B – 3 vessels;
- Category C – 44 vessels; and
- Category D – 2,558 vessels.

Not all of the vessels that received Amendment 1 herring permits were active during the 2007 fishing year. Table 29 classifies all *active* vessels – those that reported landing herring by principal gear (based on the gear which earned the most revenue for the vessel in a given year) and permit category (in 2005 and 2006, there were two open access permit categories based on intended level of herring catch). The majority of the vessels that had Category 1 permits in 2005 and 2006 qualified for either the all-areas limited access permit or the limited access Areas 2 and 3 only permit. The majority of Category 2 permits in 2005 and 2006 obtained either the limited access incidental catch permit or open access permit. However, there were a few vessels in which these patterns were reversed. The vessels in the “no permit” category did not obtain any kind of permit for herring after the implementation of Amendment 1 and do not have significant landings.

Table 30 shows the 2007 landings by gear used, management area, and permit category. Nearly 95% of the total 2007 landings are landed by vessels with an all-areas limited access permit. Approximately 36% of the total landings in 2007 were from limited access purse seine vessels landing herring from Area 1A.

2007 Atlantic Herring Revenues

Based on dealer weighout reports, herring revenues by permit category during the 2007 fishing year were:

- Category A - \$15.7 million;
- Category B – cannot report, less than three vessels;
- Category C - \$485,000;
- Category D - \$207,000.

Table 29 Number of Vessels by Principal Gear and Permit Category (VTR Data, 2005-2007)

		2005 Permit Category				Total	
		Category 1	Category 2	No Permit			
2005	PURSE SEINE	4				4	
	MIDWATER TRAWL	5	6			11	
	PAIR TRAWL	12				12	
	BOTTOM TRAWL	7	45	6		58	
	SEINE/WEIR			1		1	
	OTHER		42	16		58	
	TOTAL	28	93	23		144	
	2006 Permit Category						
		Category 1	Category 2	No Permit	Total		
2006	PURSE SEINE	4	2			6	
	MIDWATER TRAWL	6	5			11	
	PAIR TRAWL	14	1			15	
	BOTTOM TRAWL	9	50	9		68	
	SEINE/WEIR			1		1	
	OTHER		37	20		57	
	TOTAL	33	95	30		158	
	2007 Permit Category						
		All Areas	Areas 2/3	LA Inc. Catch	Open Access	No Permit	Total
2007	PURSE SEINE	6			5		11
	MIDWATER TRAWL	4			3		7
	PAIR TRAWL	13			1		14
	BOTTOM TRAWL	5	2	11	56	14	88
	SEINE/WEIR				36	14	50
	TOTAL	28	2	11	101	28	170

Table 30 2007 Herring Landings (mt) by Gear and Amendment 1 Permit Category (VTR Data)

	Management Area	Amendment 1 Permit Category					Total
		All Areas	Areas 2/3	LA Inc. Catch	Open Access	No Permit	
PURSE SEINE	1A	29,171			349		29,520
	1B	1,200			52		1,252
	3X	54					54
	Unknown	193					193
MIDWATER TRAWL	1A	3,088					3,088
	1B	1,474					1,474
	2X	1,827			762		2,589
	3X	1,043					1,043
PAIR TRAWL	1A	11,533					11,533
	1B	2,949			c		c
	2X	9,359			c		c
	3X	8,746					8,746
	Unknown	50					50
BOTTOM TRAWL	1A			420	291	5	716
	2X	5,288	c	357	124	185	c
	3X			2			2
OTHER	1A				5		5
	1B						
	2X				1	2	3

Table 31 summarizes the number of trips and days absent by management area and permit category for the 2007 fishing year. **XXX**

Table 31 Number of Trips and Days Absent by 2007 Permit Category

GEAR TYPE	AREA		2007 PERMIT CATEGORY					2007 TOTAL
			A	B	C	D	#N/A	
PURSE SEINE	1A	Number of trips	312			17		329
		Total days absent	376			17		393
		Average trip length	1.205			1		1.195
	1B	Number of trips	9			2		11
		Total days absent	11			2		13
		Average trip length	1.222			1		1.182
	3X	Number of trips	1					1
		Total days absent	2					2
		Average trip length	2					2
4X	Number of trips	1					1	
	Total days absent	1					1	
	Average trip length	1					1	
(blank)	Number of trips	2					2	
	Total days absent	2					2	
	Average trip length	1					1	
Total	Number of trips	325			19		344	
	Total days absent	392			19		411	
	Average trip length	1.206			1		1.195	
MIDWATER TRAWL	1A	Number of trips	55					55
		Total days absent	79					79
		Average trip length	1.436					1.436
	1B	Number of trips	12					12
		Total days absent	25					25
		Average trip length	2.083					2.083
	2X	Number of trips	35			58		93
		Total days absent	121			106		227
		Average trip length	3.457			1.828		2.441
	3X	Number of trips	14					14
		Total days absent	45					45
		Average trip length	3.214					3.214
	(blank)	Number of trips	14					14
		Total days absent	23					23
		Average trip length	1.643					1.643
Total	Number of trips	130			58		188	
	Total days absent	293			106		399	
	Average trip length	2.254			1.828		2.122	

Table 31 Number of Trips and Days Absent by 2007 Permit Category

GEAR TYPE	AREA		2007 PERMIT CATEGORY					2007 TOTAL
			A	B	C	D	#N/A	
PAIR TRAWL	1A	Number of trips	82					82
		Total days absent	151					151
		Average trip length	1.841					1.841
	1B	Number of trips	25			1		26
		Total days absent	51			1		52
		Average trip length	2.04			1		2
	2X	Number of trips	83			3		86
		Total days absent	278			11		289
		Average trip length	3.349			3.667		3.360
3X	Number of trips	52					52	
	Total days absent	154					154	
	Average trip length	2.962					2.962	
(blank)	Number of trips	2					2	
	Total days absent	6					6	
	Average trip length	3					3	
Total	Number of trips	244			4		248	
	Total days absent	640			12		652	
	Average trip length	2.623			3		2.629	
BOTTOM TRAWL	1A	Number of trips			227	285	41	553
		Total days absent			228	285	41	554
		Average trip length			1.004	1	1	1.002
	2X	Number of trips	58	C	28	272	97	513
		Total days absent	197	C	28	329	100	718
		Average trip length	3.397	C	1	1.210	1.031	1.400
	3X	Number of trips			3			3
		Total days absent			3			3
		Average trip length			1			1
Total	Number of trips	58	C	258	557	138	1069	
	Total days absent	197	C	259	614	141	1275	
	Average trip length	3.397	C	1.004	1.102	1.022	1.193	

Table 31 Number of Trips and Days Absent by 2007 Permit Category

GEAR TYPE	AREA		2007 PERMIT CATEGORY					2007 TOTAL
			A	B	C	D	#N/A	
OTHER	1A	Number of trips				68	40	108
		Total days absent				69	45	114
		Average trip length				1.015	1.125	1.056
	1B	Number of trips				2		2
		Total days absent				10		10
		Average trip length				5		5
	2X	Number of trips				108	49	157
		Total days absent				108	49	157
		Average trip length				1	1	1
	(blank)	Number of trips				1		1
		Total days absent				1		1
		Average trip length				1		1
	Total	Number of trips				179	89	268
		Total days absent				188	94	282
		Average trip length				1.050	1.056	1.052

Table 32 and Table 33 summarize the number of trips and the amount of Atlantic herring landings, respectively, by fishing port and permit category, for the 2007 fishing year. **XXX**

Table 32 2007 Trips by Port and Permit Category

NUMBER OF TRIPS		2007 PERMIT CATEGORY			
STATE	PORT	A	B	C	D
	Fall River	13			
	Gloucester	160		14	77
	New Bedford	83			70
	Other MA			7	35
MA Total		256		21	182
	Portland	76			13
	Prospect Harbor	65			5
	Rockland	141			
	Other ME	116			112
ME Total		398			130
	Portsmouth	3			107
	Other NH			206	
NH Total		3		206	135
	Belford				53
	Cape May	37			8
	Long Beach				
	Point Pleasant				48
	Other NJ				78
NJ Total		37			187
	Montauk Total				42
	Shinnecock Total				71
	Other NY				27
NY Total					140
RI Total		61	C	29	3
CT Total					26
Other States		2			14

Table 33 2007 Atlantic Herring Landings by Port and Permit Category

MT HERRING LANDED		2007 PERMIT CATEGORY			
STATE	PORT	A	B	C	D
	Fall River	1,189			
	Gloucester	19,742		10	100
	New Bedford	11,120			1,215
	Other MA			1	37
MA Total		32,052		10	1,353
	Portland	8,535		0	6
	Prospect Harbor	5,937			146
	Rockland	14,684			
	Other ME	7,290			280
ME Total		36,446		0	432
	Portsmouth	101		0	171
	Other NH			409	15
NH Total		101		409	186
	Belford				5
	Cape May	2,573			195
	Long Beach				
	Point Pleasant				1
	Other NJ				
NJ Total		2,573			202
	Montauk Total				5
	Shinnecock Total				9
	Other NY				1
NY Total					15
RI Total		4,789	C	358	8
CT Total					12
Other States		14			5

7.2 DOCKSIDE MONITORING – BACKGROUND INFORMATION

The Council may consider implementing a shore-based monitoring program for landings that includes some form of third party verification, perhaps in the form of what is commonly referred to as a “weighmaster.” Some general information about DFO’s Canadian Dockside Monitoring Program (DMP) is provided with this document to give some perspective on how a DMP may be structured. Canada’s DMP is called a “weighmaster” program, but the individuals/companies involved do not weigh the fish; they provide independent, third party verification of landings for DFO and the industry. There are six approved Dockside Monitoring Companies that provide weighmaster services for DFO and the industry. DFO approves these companies, but the fishermen may select which company they want to employ.

Summary of Canadian Dockside Monitoring Program (DMP)

Agency Responsibilities:

- The Canadian Department of Fisheries and Oceans (DFO) will oversee Dockside Monitoring Companies (DMCs) participating in the DMP
- DFO will certify DMCs eligible to participate in the DMP
- DFO will review/approve training programs developed by DMCs
- DFO will develop protocols to increase accuracy of landings data

DMCs must:

- Submit corporate paperwork
- Be in good financial standing
- Develop a plan to operate on a 24-hour basis
- Develop a training plan for dockside observers, including:
 - Industry fish-handling practices, offloading methods, and weigh-out practices and protocols
 - Role and purpose of data in fisheries management
 - Fish identification
 - Ethics
 - DMP policies and procedures
 - Recording and reporting procedures
 - Weights and measures
 - Data quality
 - Communication skills and conflict management
- Establish criteria to prevent perceived conflicts of interest
- Establish a plan to ensure data quality
- Reapply for certification every 2 years
- Submit to routine audits to ensure accurate and timely data
- Deploy dockside observers to monitor offloading and record deployment levels
- Document and forward incident reports (e.g., failure to offload catch)

- Protect the confidentiality and privacy of data
- Maintain all hail reports and landings records for 2.5 years
- Facilitate collection of logbook data
- Report data to DFO on a weekly basis

Dockside observers must meet several requirements, as follows:

- Successfully complete high school education or equivalent
- Be a Canadian citizen or legal equivalent
- Submit to a background check and have no fisheries-related convictions
- Be independent from vessels they observe (to prevent conflicts of interest)
- Be physically fit
- Successfully complete DMC training
- Conduct a minimum number of landings observations each year
- Obtain a dockside observer license
- Duties:
 - Arrive at landing station at least 15 minutes before scheduled offloading
 - Record gear type, logbook weight by species, product type, area fished, vessel number, and weight of fish using certified scales.
 - Confirm that all fish are offloaded by checking holds
 - Confirm that landings match logbook entries
 - Maintain a line-of-sight at all times during offloading procedures
 - Verify and record weigh-out information

Vessel requirements:

- Call the IVR system 6 hours before departure
- Submit a hail report to the DMC at least 3 hours before returning to port:
 - Vessel and captain name
 - Vessel permit number
 - Logbook page number
 - Accurate weight of fish on board by species
 - Date and time of landing and offloading
 - Location of offloading
 - Dealer purchasing fish

Additional Considerations Re. Weighmaster Programs (Modified from Groundfish Amendment 16 Discussions)

The Council has recently developed measures for shoreside monitoring of sector landings for consideration in Amendment 16 to the Multispecies (Groundfish) FMP. The proposed provisions are somewhat different than those in Canada and are described below, following some general discussion regarding objectives, scope, questions to consider, and NMFS recommendations.

Objectives: In considering a weighmaster program, the Council should define its objectives for the program. These objectives would shape the scope and detail of any program implemented. Objectives could include:

- To provide accurate and timely landings information for all or a portion of landed catch;
- To validate dealer landings reports through independent, third-party observation of landings; and/or
- To ensure compliance with offloading and reporting requirements.

Scope: The Council should evaluate whether a weighmaster program should observe all herring landings, or a representative subset of all herring landings.

Questions the Council Should Consider When Developing a Weighmaster Program

- How will a weighmaster program be implemented?
- How involved can/should NMFS be with the implementation of a weighmaster program?
- How would weighmasters operate?
- Should weighmasters apply for certification to operate from NMFS?
- Should weighmasters operate in specific ports or across the entire region (e.g., through area coordinators who distribute weighmasters similar to the Observer Program)?
- What is the payment mechanism for an industry-sponsored weighmaster program?

NMFS Recommendations (Groundfish):

1. Weighmasters should validate dealer landings, but not actually weigh fish, unless necessary to accommodate ports without adequate facilities.
2. All landings should be observed at the point of first offload, regardless where the product is finally sold – some accommodation must be made to weigh fish at point of first offload.
3. Vessels should coordinate landing operations with the weighmaster:
 - Via hail report at least 6 hours prior to landing, including date/time and port of landing, landings amount, area fished, and other pertinent data, as appropriate, or
 - During landings window (e.g., 6 am to 6 pm)

Amendment 16 – Standards for Sector Monitoring and Reporting Service Providers (Draft as of November 10, 2008)

The following standards would be used by NMFS to evaluate service providers employed by sectors to comply with the dockside and at-sea monitoring and reporting requirements outlined in this section. NMFS will certify/approve service providers and associated dockside, roving, and at-sea 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 APA. In its yearly operations plan, each sector must demonstrate that its sector monitoring program adheres to the sector monitoring and reporting requirements outlined in this section, including the use of an approved service provider for sector reporting and dockside, roving, and

at-sea monitoring services before the operations plan can be approved by NMFS. The following standards and criteria for approval can be further modified by a future Council action.

Sector monitoring program service providers, including those providing dockside, roving, and at-sea monitor services, 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 sector 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 fishery monitoring/reporting services provider and the arrangements to be used.
- Evidence of adequate insurance to cover injury, liability, and accidental death for dockside, roving, and at-sea monitors (including during training). Workers' Compensation and Maritime Employer's Liability insurance must be provided to cover the dockside, roving, and at-sea monitors; vessel owner; and service provider. Service providers shall provide copies of the insurance policies to dockside, roving, and at-sea monitors to display to the vessel owner, operator, or vessel manager, when requested.
- Proof that its dockside, roving, and at-sea monitors, either contracted or employed by the service provider, are compensated with salaries that meet or exceed the U.S. Department of Labor (DOL) guidelines for fishery observers. Dockside, roving, and at-sea monitors shall be compensated as a Fair Labor Standards Act (FLSA) non-exempt employees. Service providers shall provide any other benefits and personnel services in accordance with the terms of each monitor's contract or employment status.
- Proof that the service provider's dockside, roving, and at-sea 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 (EAP) describing its response to an emergency with a dockside, roving, and at-sea monitors, including, but not limited to, personal injury, death, harassment, or intimidation.
- Evidence that the company is in good financial standing.

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

- A comprehensive plan to deploy NMFS-certified dockside, roving, and at-sea monitors, or other at-sea monitoring mechanism, such as electronic monitoring equipment that is approved by NMFS, 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 dockside, roving, and at-sea monitors, or other approved at-sea monitoring mechanism to all ports in which service is required.
 - A service provider must report dockside, roving, and at-sea monitors and other approved at-sea monitoring mechanism deployments to NMFS and/or the sector manager in a timely manner to determine whether the predetermined coverage levels are being achieved for the appropriate sector.
 - A service provider must assign dockside, roving, and at-sea monitors and other approved at-sea monitoring mechanisms without regard to any preference by the sector manager or representatives of vessels other than when the service is needed and the availability of approved/certified monitors and other at-sea monitoring mechanisms.
 - A service provider's dockside, roving, and at-sea monitor assignment must be representative of fishing activities within each sector and must be able to monitor fishing activity throughout the fishing year.
 - A service provider must be able to determine an estimate of discards for each trip, compare the estimated discard weights to reported discard weights on VTRs to utilize the most accurate source of discard data, and provide such information to the sector manager and NMFS, as appropriate and required by this section.
- The service provider must ensure that dockside, roving, and at-sea monitors remain available to NMFS, including NMFS Office for Law Enforcement, for debriefing for at least 2 weeks following any monitored trip.
- The service provider must report possible dockside, roving, and at-sea monitor harassment; discrimination; concerns about vessel safety or marine casualty; injury; and any information, allegations, or reports regarding dockside, roving, or at-sea monitor conflict of interest or breach of the standards of behavior to NMFS and/or the sector manager, as specified by NMFS.

- Service providers must submit to NMFS, if requested, a copy of each type of 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., sectors and participating vessels) and between the service provider and specific dockside, roving, or at-sea 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 dockside, roving, or at-sea monitor or other approved at-sea monitoring mechanism on a requesting fishing vessel for any reason including, but not limited to, the following:
 - If the service provider does not have an available dockside/roving monitor prior to a vessel's intended date/time of landing, or if the service provider does not have an available observer or other at-sea monitoring mechanism approved by NMFS within 72 hours of receiving a request from a vessel.
 - 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 dockside, roving, or at-sea monitors other approved at-sea monitoring mechanism.
- 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, sectors, sector managers, 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.
- A system to record, retain, and distribute the following information for a period specified by NMFS:
 - Dockside/roving monitor deployment levels
 - 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.

For an individual to be certified as a dockside, roving, or at-sea monitor, the service provider must demonstrate that each potential monitor meets the following criteria:

- Candidates must possess a Bachelor's degree with a major in one of the biological sciences from an accredited four-year college or university with at least 30 semester hours in any combination of scientific or technical courses. The education requirement may be waived, based on specialized experience, on an individual basis, with approval by NMFS.
- Successful completion of all NMFS-required training and briefings before deployment.

- Physical and mentally capacity for carrying out the responsibilities of a dockside, roving, or at-sea monitor on board fishing vessels, pursuant to standards established by NMFS such as being certified by a physician to be physically fit to work as an at-sea monitor or dockside monitor. The physician must understand the monitor's job and working conditions. Physical considerations include, but are not limited to the following:
 - Susceptibility to chronic motion sickness;
 - Ability to live in confined quarters;
 - Ability to tolerate stress;
 - Ability to lift and carry heavy objects up to 50 pounds;
 - Ability to drag heavy objects up to 200 pounds; and
 - Ability to climb a ladder.
- A current Red Cross (or equivalent) CPR/first aid certification.
- 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

7.3 PRELIMINARY ASSESSMENT OF POTENTIAL COSTS OF SOME ELEMENTS OF STAKEHOLDER CATCH MONITORING PROPOSALS

The purpose of this discussion is to provide preliminary feedback to the Herring Committee on the potential costs associated with some components of the CHOIR and Herring Alliance monitoring proposals. Estimates of costs were provided in each proposal, but the preparers' access to recent information about the fishery may have been limited. This section provides information regarding some of the assumptions about herring fishing activity as it relates to monitoring costs.

This discussion does not represent a detailed analysis of each proposal. As alternatives are developed by the Herring Committee and the Council for the Draft EIS, more detailed analyses of monitoring costs will be provided. This discussion also provides some qualitative discussion of potential costs.

7.3.1 Census vs. Sample

In general, the over-riding feature of both proposals is that a census (very high level of sampling) is required to estimate with confidence the level of bycatch in the Atlantic herring fishery. This is somewhat separate from the need to ensure that all catch of herring is accurately recorded for purposes of quota monitoring and/or is available for inspection by either at-sea or land-based samplers.

From the assumption that the current level of sampling for bycatch is inadequate, the question then becomes *what amount of sampling provides managers with a reasonable level of confidence when estimating bycatch in the Atlantic herring fishery?* The Standardized Bycatch Reporting Methodology (SBRM) amendment provides guidance on this issue. Moving beyond the SBRM

level and approaching census levels raises the question of benefits versus costs. That is, does the marginal benefit of increased precision of bycatch estimates outweigh the marginal increase in sampling costs (regardless of who pays)?

Also at issue is whether increasing the sample size is a more appropriate course of action versus developing measures to improve how representative the current sample is of the population (for example, are observer days or port sampling occurrences appropriately stratified over gear/area/season?). In this case, gains in precision might be obtained from better sampling methods without the associated costs of increasing sample size.

7.3.2 Full/Maximized Retention of Catch

The CHOIR proposal advocates full/maximized retention of catch on herring vessels to ensure that any bycatch that might normally be discarded at sea (and possibly not observed) will be documented through a land-based sampling program.

For the Atlantic herring fishery, one significant impact of full/maximized retention may relate to handling unwanted herring. Herring that is determined to be of low quality and unsuitable for sale would have to be disposed. This is further complicated by the regulatory prohibition on direct mealing. This potential cost may be mitigated somewhat by the demand for lobster bait or other non-human uses, but this is likely to be seasonal.

Unwanted herring may also be a result of landing more herring than is needed by the market. Often, captains begin a trip with a market order for a certain quantity. If they are unable to precisely fill their holds with that quantity, they may be forced to arrive in port with an excess that they must either sell to another buyer or dispose it. This could have the effect of suppressing prices.

Disposal of unwanted non-herring catch may also be an issue. The extent of this will be determined by market conditions for those species (and the authority to land them) and the degree of bycatch (which is the issue currently under debate). In addition, a requirement to keep unwanted non-herring catch could be problematic if the unwanted fish compromise the quality of herring catch (dogfish, for example), or if sorting the catch during pumping operations increases fishing/handling time (which could affect operating costs). Participants in the herring fishery have cited in the past as one reason that they try to avoid non-target species. These issues should be explored in detail if full/maximized retention is considered in this amendment, and approaches to mitigate/minimize costs should be considered.

An extensive review of the literature regarding realized costs of full retention programs has not yet been conducted, but the following excerpt from the Federal Register pertaining to a full retention program in the Pacific groundfish and halibut fisheries provides an indication of the kinds of costs that may be associated with such a program.

Federal Register, January 21, 2004 Proposed Rule:

Fisheries of the Exclusive Economic Zone off Alaska; Full Retention of Demersal Shelf Rockfish in the Southeast Outside District of the Gulf of Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS issues a proposed rule that would require full retention of demersal shelf rockfish (DSR) by certain vessels fishing in the Southeast Outside District (SEO) of the Gulf of Alaska (GOA). This proposed rule would require that the operator of a federally-permitted catcher vessel using hook-and-line or jig gear in the SEO must retain and land all DSR caught while fishing for groundfish or for Pacific halibut under the Individual Fishing Quota program (IFQ) in the SEO. Under existing Federal and State of Alaska regulations, all landed fish must be weighed and reported on State of Alaska fish tickets or, in the case of fish landed in a port outside of Alaska, on equivalent Federal or State documents. Current maximum retainable amounts (MRAs) for DSR in the SEO would be eliminated for catcher vessels but would remain in place for catcher/processors (CPs) in the SEO. This action is necessary to improve estimates of fishing mortality of DSR. This proposed rule is intended to further the goals and objectives of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP).

...

Under this proposed rule, small entities may experience increased costs associated with handling the additional DSR, storing them on the vessel until it reaches port, and unloading and disposing of the fish. Some fishermen may incur additional costs as a result of changing their fishing patterns for their target species in order to avoid DSR bycatch. Handling and delivery costs would take the form of increased work effort required on the vessel, but would not affect the operation's cash flow. Costs may be higher on smaller vessels using refrigerated sea water (RSW) that lack deck space for special DSR totes, or on vessels that would otherwise have filled their holds with their target fish, but that are unable to given the need to retain a larger amount of DSR. Fishermen will also face costs of disposing of the excess DSR on shore since they will not be allowed to sell the excess. Fishermen may only use the excess DSR for personal use, donate it for charitable purposes, or discard it. Small processors would face the costs of weighing and recording additional DSR that may be landed. They are likely to play a role in helping vessel owners to dispose of DSR in excess of the amount that could be sold. These actions could include allowing employees to fillet and take excess DSR, adding DSR waste to the processors' waste streams, or coordinating with donation programs to take excess DSR. Processors would no longer be able to sell excess DSR from federal waters. In 2001, excess DSR totaled approximately ten metric tons (the largest annual volume listed), equivalent to about \$16,000 in gross revenues from this source.

7.3.3 Video-Based Electronic Monitoring (VBEM)

Setup and infrastructure costs such as VBEM system purchase, equipment, or service costs are not addressed in this discussion at this time but will be evaluated if these measures are proposed in an alternative in this amendment. Additional information is provided below regarding the ongoing costs once VBEM systems are implemented.

The CHOIR proposal estimates that the ongoing cost for VBEM is \$290 per sea day. In 2007, the 30 active Category A and B vessels were at sea for a total of 1,586 days. At a cost of \$290 per day, the total annual cost would be approximately \$460,000 or \$15,000 per active vessel.

7.3.4 Dockside Monitoring

Infrastructure costs including flow scales and vessel surveying costs are not addressed in this discussion at this time but will be evaluated if these measures are proposed in an alternative in this amendment. The CHOIR proposal estimated \$10,000 per vessel. For 46 vessels, the total cost would be \$460,000.

The CHOIR proposal utilizes two methods for calculating dockside monitoring costs. The first is a \$300 per landing event cost. In 2007, the Category A vessels landed herring 757 times, and the Category B vessels landed herring 58 times for a total of 815 landing events. The vast majority of these landing events were in the ports of Gloucester MA, New Bedford MA, Portland ME, Prospect Harbor ME, and Rockland ME. At a rate of \$300 per landing event, the total dockside monitoring costs would be \$244,500 or an average of \$8,150 per active vessel (30 of the 47 vessels with Category A or B permits were active in 2007). The average cost per vessel with Category A/B permits is \$5,315 per vessel.

The second method uses a rate of \$3,300 per month for one to two roving monitors based on conversations with service providers. For twelve months, this is a total of \$39,600 or \$860 per permitted vessel.

Further investigation into the costs associated with dockside monitoring will be conducted as the Council develops the management alternatives in Amendment 4.

7.3.5 100% Observer Coverage of Category A and B Vessels

The Herring Alliance proposal advocates 100% observer coverage for Category A and B herring vessels. The proposal estimates that a third-party observer program could operate at a cost of \$600 to \$700 per sea day (as opposed to a cost of approximately \$1,200 per day for a federally-provided observer). In 2007, the 30 active Category A and B vessels were at sea for 1,586 days. If the rate of observer coverage is 100%, at \$700 per day, the total annual cost would be just over \$1.1 million. On a per active vessel basis, the cost would \$37,000 per vessel.

To put this into a total-revenue perspective, the Herring Alliance concludes that based on the estimate of costs provided in the proposal, this level of observer coverage represents 3% to 3.5% of total fishery revenues. A similar comparison is made here. However, since there were only two active vessels with Category B permits in 2007, for data confidentiality reasons, the Category B vessel revenues cannot be reported. Instead, only Category A vessels are examined. Total Category A days at sea in 2007 were 1,522, resulting in a total cost of \$1.06 million based on an assumed observer cost of \$700 per day. Total revenues were \$15.7 million for Category A vessels in 2007, so this represents a cost of nearly 7% of revenues annually. While these comparisons provide some perspective, the true measure of economic impacts will be the impact on profits. As management alternatives develop, available cost data will be queried to estimate what these costs represent as a percent of profits.

Note that for 2009, the total observer days available for monitoring *all fisheries* in the Northeast region equate to approximately 1,500 sea days.

7.3.6 Impacts on Vessel Operations

Both the CHOIR and Herring Alliance proposals have aspects in their plans that have the potential to impact vessel operations. The extent of these costs is not fully understood and are not estimated in either proposal. As monitoring alternatives develop, the Herring PDT will further evaluate the potential costs to vessels, in terms of how vessel operations might change (and the associated costs) in order to comply with the new measures. Some potential costs could include (not an exhaustive list):

- Increased fuel costs from returning to port if transfer of catch to a carrier vessel is not allowed because it was not observed;
- Longer trips (and associated higher costs) if the flow of product from the net to the hold is significantly interrupted to accommodate sampling.