



Coalition for the Atlantic Herring Fishery's Orderly, Informed and Responsible Long-Term Development

December 5, 2008

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

Re: Herring Amendment 4 Catch Monitoring Program

Dear Lori,

I am submitting the following herring Catch Monitoring Proposal on behalf of the CHOIR Coalition. CHOIR is an industry coalition made up of commercial and recreational fishing organizations, fishing and shore side businesses, and eco-tourism companies. CHOIR is recognized as a stakeholder in the herring fishery and is a leading voice for the proper management of herring.

We are submitting the following proposal because we feel that it will help improve the monitoring system in the herring fishery and, in turn, to improve overall management of this resource. We have laid out a system that we think will allow for adequate monitoring while also allowing for it to be done in the most economically feasible manner.

While we feel this method can be effective, it will require the herring industry to help develop it into a program that works. The key is that in the long run, electronic monitoring should yield cost and efficiency savings over human observers, but if the industry are unwilling to do this work, then we will revert back to demanding 100% human observer coverage. We hope that the managers and herring industry will see the benefits of our proposal and work together towards implementing such a system.

Thanks for your time,

A handwritten signature in blue ink that reads "Stephen B. Weiner".

Steve Weiner, Chair

Herring Amendment 4 Catch Monitoring Program

CHOIR Coalition Response to NEFMC Request for Proposals

Proposed Action: Implementation of a Maximized Retention and Dockside Monitoring Program for the Atlantic Herring Fishery

For further information:

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1.0 Executive Summary

This document outlines a comprehensive catch monitoring program as designed by the CHOIR Coalition for the Atlantic herring fishery in New England, to be implemented through Amendment 4 to the Fishery Management Plan (FMP), currently under development by the New England Fishery Management Council (NEFMC). This program would monitor the herring fishery using cutting edge technology and in a highly efficient manner by conducting most of the laborious catch sampling on shore. It would also eliminate the current reliance on self-reporting and good-faith catch weigh estimates in the fishery by ensuring independently verifiable landings reports that include actual weights for all fish, or approved verifiable volumetric proxies.

Specifically, this plan would implement Maximized Retention (MR) in the herring fishery, mandating that the vast majority of catch is landed. Video-Based Electronic Monitoring (VBEM) would be used at-sea to verify compliance with MR requirements and thus ensure the desired percentage of catch is brought to shore. Once on shore, 100% of landings events would be subject to Dockside Monitoring (DSM), that is, they would be observed by a shore-based fishery observer (SBO) who would census and/or subsample the entire landing to provide a certified landings reporting including landed weights for all species.

The proposed action will rely heavily on a tool to be imported from Alaska called the Catch Monitoring and Control Plan (CMCP), which each first receiver (catching vessel) of herring would be required to design and submit for approval. Under a CMCP model, managers do not micromanage fishermen. Instead, managers lay out specific data elements that must be provided and specific monitoring guidelines that must be met and industry is given the freedom and responsibility to choose its own tools and craft its own solutions.

This proposal outlines the preferred alternative described above in detail, and where appropriate provides a series of options within that framework. In addition, it provides preliminary estimates of impacts, including costs and possible funding mechanisms. Finally, it lays out alternatives to the proposed action for comparative purposes.

CHOIR advances this proposal to use MR/VBEM/DSM because we believe that in the long-run the high-volume catch in this fishery is best sampled on shore provided at-sea discards are all but eliminated. We further believe that the most cost effective long-term way to verify MR at 100% certainty is with VBEM.

However, use of VBEM in this manner will be challenging, especially in the beginning. If the industry is unwilling or unable to do the hard work necessary to build and maintain a VBEM program that will truly verify compliance with maximized retention, CHOIR will revert back to supporting 100% at-sea observer coverage with strong protocol improvements to end at-sea dumping of unsampled catch.

2.0 Background and Introduction

2.1 Management Context

The New England Fishery Management Council (NEFMC) has undertaken Amendment 4 (Am. 4) to the Atlantic Herring Fishery Management Plan (FMP), in part to address longstanding concerns about the shortcomings of the existing catch monitoring program in the fishery.

As part of ongoing work on Amendment 4, the NEFMC issued a Request for Proposals (RFP) on October 16, 2008 inviting fishery stakeholders to draft and submit proposals for a new, comprehensive catch monitoring program for the herring fishery. The recommendations and ideas in the proposals will be used to help draft the range of alternatives for catch monitoring that the Council will consider in Amendment 4.

The CHOIR Coalition submits the following proposal and has endeavored to lay out our recommendations according to NEFMC management document structure, in order to ensure the proposed program elements can be easily translated into alternatives for Am. 4 by Council staff and transferred to the Draft Supplemental Environmental Impact Statement (DSEIS) if approved by the Council.

2.2 CHOIR Coalition

The CHOIR Coalition is an industry coalition made up of commercial and recreational fishing organizations, fishing and shore side businesses, and eco-tourism companies. CHOIR was formed in 2002 by five charter members (East Coast Tuna Association, North Shore Community Tuna Association, General Category Tuna Association, the Cape Cod Commercial Hook Fishermen's Association, and the Recreational Fishing Alliance).

Since its founding, CHOIR has increased its membership to include ecotourism businesses and other concerned ocean user groups and marine businesses. Our most recent sign-on letter, submitted in June 2008 for Am. 4 Scoping, was endorsed by nearly 280 marine business signatories from all 5 coastal New England states. In joining these traditionally disparate groups, CHOIR has gained credibility with decision makers on both regional and national levels, and is recognized as a stakeholder in the herring fishery and a leading voice for the responsible management of herring.

CHOIR fully supports a sustainable herring fishery. Herring is an important resource: as a source of bait in the lobster, longline, and tuna fisheries, as product for canneries and freezer plants, and as forage for important fish stocks and marine mammal populations. CHOIR has supported and worked together with purse seine, fixed gear, and midwater trawl herring fishermen. Our concern is about specific gear types- midwater trawling and pair trawling- being used as they are now, with poor monitoring and in the inshore area.

2.3 Archipelago Marine Research LTD.

This proposal includes extensive use of Video-Based Electronic Monitoring (VBEM). Archipelago Marine Research LTD., a Victoria, B.C. corporation, is the leading provider of this technology and the expertise necessary to effectively utilize it. They have extensive experience in the field including management of a fully operational VBEM and maximized retention program in a midwater trawl fishery in the U.S. - the Pacific Fishery Management Council (PFMC) shore-based hake (whiting) fishery. In addition, they have successfully partnered in the past with CHOIR founding member CCCHFA on VBEM studies in New England, including one with the herring industry in which VBEM was successfully tested on a midwater trawl vessel.

Archipelago is not the only possible provider of VBEM services as envisioned under the proposed action; however they are, in CHOIR's opinion, the best choice to help develop a VBEM program if the Council and industry choose to do so. Therefore we reference their expertise and past work repeatedly throughout the document, and operate under the assumption that their advice and cooperation would be welcome.

Furthermore, while Archipelago personnel have reviewed this proposal, there are two important disclaimers to present. First, Archipelago supports this proposal to the extent that they believe the technology and methodology are sound to achieve the desired monitoring goals. However, Archipelago has little experience with this fishery and therefore is not in a position to provide opinion on the specific regulatory suggestions or policy solutions contained in the document. Instead, and as the Council RFP suggests, Archipelago is willing to help further develop the ideas contained herein and other monitoring solutions as Am. 4 moves forward, working not just with CHOIR or any other stakeholder, but with the Council and all interested parties.

Second, Archipelago cannot simply hand over the keys to a VBEM program upon implementation of Am. 4. Building a VBEM program takes hard work and time, a united, proactive and fully bought-in industry, and a supportive Council and Agency. Instead, Archipelago is willing to help those willing to help themselves through the development of innovative partnerships and cooperative agreements that will allow their equipment and expertise to make a difference on the ground in New England.

2.4 Relationship to Previously Submitted Policy Statement (CCCHFA)

The Cape Cod Commercial Hook Fishermen's Association (CCCHFA), a charter member of CHOIR, submitted a white paper on Dockside Monitoring (DSM) to the Council in September of 2008, in response to a Council staff request that CCCHFA further develop ideas on DSM it had worked up for the state of Massachusetts. CCCHFA reworked those ideas into a paper entitled **"Shore Based Monitoring in the Atlantic Herring Fishery: Translation of Successful U.S. Models to New England including Context of Dockside Tools within Comprehensive Catch Monitoring Programs"** which is available through the NEFMC website (http://www.nefmc.org/herring/council_mtg_docs/Oct2008/Doc8_CCCHFA_White%20Paper_Shore%20Based%20Monitoring_Final%20for%20NEFMC.pdf)

This CCCHFA white paper, which was well received by the NEFMC Herring Oversight Committee (OSC) at its meeting on 9/30/08 and 10/1/08, explained key concepts of robust DSM and the need to place DSM in the context of equally robust at-sea measures in order to estimate total catch in a fishery. One example of a robust at-sea companion solution explored in the white paper is Verified Maximized Retention (VMR), under which all catch except prohibited species is brought to shore for sampling.

This CHOIR Coalition Am. 4 monitoring proposal is a logical evolution of that CCCHFA white paper and is intended to incorporate the ideas it contains. CCCHFA fully endorses this CHOIR Coalition proposal and its advancement of the previously submitted ideas.

2.5 Statement of Purpose and Need

This proposal focuses only on the monitoring portions of Am. 4. Monitoring is a primary focus of Am. 4 and the amendment was partially initiated in response to ongoing stakeholder objections to the inadequate existing monitoring program. The implementation of the Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment did not adequately address these concerns. The following excerpt from the Am. 4 scoping document outlines the Council's stated purpose and need for a monitoring overhaul:

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.

A more in-depth discussion of the flaws of the existing monitoring program may be found in Section 5 of this document, under the description of the Status Quo Alternative, but a brief summary taken from the CHOIR Coalition Am. 4 Scoping Comments will highlight some of those flaws and illustrate specific reasons CHOIR maintains the proposed action is needed and thus the purpose of that action:

The current system is entirely inadequate and must be replaced for the following reasons:

- Observer coverage is far too low and erratic.
- Observed catch is not extrapolated fleet-wide against quotas and bycatch caps
- There is not enough coverage, consistency, rigor or transparency in the existing shore-side monitoring programs
- Landings and discard data are neither accurate nor timely
- Fishery has a Total Allowable Catch (TAC) of Atlantic herring, but is managed to a TAL (Total Allowable Landings)
- There is too much reliance on unverified industry reporting: most landings and discards are never actually weighed or their quantities independently verified through some kind of standardized measurement technique
- Catch is not clearly defined to include the entire contents of the net. Thus, loopholes in the regulations allow for partial or whole cod-ends to be dumped at sea without being sampled, even on observed trips (slippage)
- Other loopholes allow vast quantities of catch to go unobserved on observed trips, including ongoing failure to properly observe pair trawl effort by placing observers on both vessels, and other at-sea transfers
- Pre-sorting of fish takes place on observed trips. Vessel crew and mechanical devices remove bycatch upstream of observers, severely biasing the data
- The herring fishery is permitted to fish in high risk times and areas in terms of bycatch, for instance groundfish closed areas, and the risk is often managed through caps or tolerances (1% in groundfish closed areas) which are not meaningful under the current monitoring system because the data are inadequate

2.6 Summary of Scoping Comments

The RFP calls for stakeholders to outline goals and objectives for a herring fishery monitoring program. Indeed, to date the Herring OSC and Council have not articulated these important foundations that will eventually lead to the creation of alternatives. Prior to the October NEFMC meeting, CHOIR and CCCHFA representatives suggested that this critical step needed to be taken, and further suggested that the Scoping Period of the amendment was conducted for the very purpose of soliciting stakeholder and public input on the subject. In order to facilitate interpretation of the scoping comments and incorporation of the ideas they contain into Am. 4, CCCHFA staff prepared a memo summarizing all Am. 4 written and verbal scoping comments which was submitted to the NEFMC on 10/7/08. Table 1 below is excerpted from that memo and contains a comment analysis specific to catch monitoring.

Table 1: Long term monitoring Comment:	Written Comment From:			Verbal Comment From:		
	Individual	Groups/ Organizations	Total	Individual	Groups/ Organizations	Total
No change				1		1
Support objective 1 as written			1			1
Concerned with current low level of monitoring	8983		9	8992		
At-Sea Observer Coverage						
Increase at-sea observer coverage			1	1	2	4
Increase at-sea observer coverage (100%)	3830		2	3832	6	11
Increase at-sea observer coverage (200%)			1	1		
Increase at-sea observer coverage (50%)	6			6		
Observer levels should be consistent throughout all fisheries and determined following guidelines from the SBRM document	1		3	4	1	2
Clearly define goals of observer program						1
Observer sampling should be prior to any presorting by grates			2	2	1	1
Consider third parties as possible sources for funding observer coverage			3	3		3
Support industry funded observer program	7		4	11		
Do not support industry funded observer program			3	3		
Alternative Monitoring Methods						
Design monitoring program which provides 100% catch monitoring	6854		7	6861	2	5
Expand & develop shoreside monitoring program to weigh all catch and certifies the offloads			3	3	2	4
Support electronic monitoring program			7	7	3	4
Increase port sampling (rather than shoreside monitoring)				1	1	2
Develop real time landing reporting system to assist management	654		5	659		
Develop program to certify offloads	635		3	638		
Develop program that provides actual weights at first point of offloads	635		4	639		1
Develop shoreside monitoring	3694		4	3698		
Investigate Alaskan models for catch monitoring	1		2	3		
Reporting						
Develop real time catch reporting and quota tracking for all species including bycatch	5663		4	5667	1	2
Develop tow by tow catch reporting through VMS			1	1		
General Comments						
Prohibit dumping of live or dead fish	8080		2	8082	3	6
Implement measures to quantify and reduce river herring bycatch						1
Improve catch monitoring & reporting	3332		5	3337	3	6
Improve real time monitoring such as on a trip by trip or daily basis	2768		5	2773		3
Concerns about bycatch of river herring	45		7	52	1	3
Concerns about bycatch of groundfish and other species	1938		5	1943	4	7
Develop joint mid-water pelagic call in code to ease reporting burden			1	1		
Shoreside monitoring is less costly than at-sea monitoring			1	1		1
Monitor contact of trawling gear with sea floor			1	1		

Table 1: Summary of Amendment 4 Scoping Comments on catch monitoring
Source: CCCHFA Analysis and Memo to NEFMC 10/7/08

The information in Table 1 clearly shows that an overwhelming number of the stakeholders and members of the public who participated in the scoping process support a major overhaul of the monitoring program in the herring fishery. Most have requested a program that will sample far more, if not all of the catch, including an end to at-sea dumping of unsampled catch. Most want real-time, transparent quota and bycatch tracking. Many want the current system in which good-faith weight estimates from captains and dealers are accepted to be replaced with a system that provides certified, actual measurements of catch and landing weights.

This analysis is confirmed by similar work done by Council staff for the October meeting. Figure 1 below is a slide excerpted from a PowerPoint presentation to the Council by Lori Steele on 10/8/08 summarizing Council staff analysis of the Scoping Comments on monitoring

Catch Monitoring (Scoping)

- General agreement to improve catch monitoring and make it more real-time/transparent
- Industry suggestions for improving reporting and real-time TAC monitoring
- Widespread support for 100% monitoring through a combination of at-sea and shoreside
- Industry support for expanding dockside monitoring and port sampling (cost effectiveness, efficiency)
- Consider comments/suggestions from Herring Advisory Panel
- Long-term funding is a major issue/concern

Figure 1: Council staff summary of Amendment 4 Scoping Comments on catch monitoring
Source: NEFMC 2008,

(http://www.nefmc.org/herring/council_mtg_docs/Oct2008/081008_Herring%20AM%204_Progress_STEELE.pdf)

In addition, the same presentation presented additional bullets on bycatch monitoring suggestions culled from the scoping comments, which included the following: redirection of funds for more observer coverage, require all catch and landings to be sorted and weighed by species, full retention (no dumping) and examination of models from other regions for weighing, sorting and certifying high-volume catch.

3.0 Goals and Objectives of the CHOIR-Proposed Monitoring Program

Please note that for fishery monitoring purposes, the term “census” may be used in two different ways with regards to catch monitoring: to describe a fishing-event coverage approach (wherein census=100% of fishing-events) or to describe a catch-sampling technique in which all animals are counted (as opposed to subsampling, for instance through the use of basket-sampling). The term “census” is used below in the former sense (i.e. an observer works up the catch for 100% of fishing-events, sampling or subsampling 100% of the catch).

To illustrate the reason for this clarification, choosing to take a non-census approach to monitoring, on any level and in any sense of the word, requires the eventual use of extrapolation to derive total catch. A non-census approach to fishing-event coverage requires extrapolation to unobserved events. A non-census approach to catch sampling requires extrapolation to the unobserved portion of that haul.

To further illustrate this point, under current NEFOP protocols, catch sampling consists of a combination approach (basket sampling is used to subsample individual hauls and the subsample is extrapolated up to the haul level, and an unextrapolated census of larger animals is added to this). Since NEFOP covers less than 100% of fishing-events in the herring fishery, deriving total catch estimates essentially requires a double extrapolation.

Goal:

Near real-time catch accounting with one of the following:

- Preferred Alternative: 100% sampling (census-style approach which samples all fishing-events) **or**,
- Highly transparent, publicly-available information demonstrating the application of extrapolation techniques to derive clear estimates of fishery impacts on all species to a 20% Coefficient of Variation (CV).

Objectives:

- 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 workaround 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

4.0 Proposed Action (Preferred Alternative)

Under the preferred alternative, the herring fleet will fish with 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.

VBEM can be successfully used to identify at-sea discard events in violation of maximized retention requirements. VBEM as designed and operated by Archipelago consists of an onboard data-logging computer (control box) which accepts and stores data from an array of fishing activity sensors including a Global Positioning System (GPS), hydraulic pressure sensors, and winch-drum rotation sensors that together provide a time-date-location stamped record of fishing activity. The activity sensors also automatically trigger imagery recording by up to four (4) closed-circuit television (CCTV) cameras based on pre-set trigger points. The CCTV cameras provide a high-resolution record of deck activity that, when analyzed against the fishing-activity sensors provides a clear record showing the presence or absence of discarding events. The entire system is tamper-evident and tampering is a violation, as is fishing while the system is disabled or otherwise not operational. User interfaces are provided so that vessel operators can verify operation and troubleshoot the system. The system is not designed to measure size and species composition of discard events at high precision or accuracy. Instead, it is designed to identify that an event has taken place in order to trigger accountability measures and/or ultimately eliminate the behavior.

4.1 Introduction:

Dockside monitoring (DSM) is a powerful solution to the problem of adequately monitoring high-volume fisheries, although it is not a robust solution in and of itself- it must be paired with measures to monitor or eliminate at-sea discards. Properly monitoring these fisheries is a challenge and the opportunity to face it on dry land instead of a cramped, heaving deck should not be lightly dismissed. Furthermore, proper monitoring required some degree of sorting at some point, and in most cases product quality concerns for high-volume forage fisheries demand that the fish are quickly transferred from net to hold. Laborious and time-consuming catch sampling at sea is difficult. This section will describe the proven tools and technologies for dockside monitoring that should be imported to New England from other U.S fisheries, and also place dockside monitoring in the larger context of a robust catch monitoring plan for the New England herring fishery as a whole.

Dockside monitoring is a powerful tool that should form a cornerstone of Amendment 4, but only as part of a larger system that delivers accurate and precise accounting of all catch by also addressing at-sea discards in a robust fashion. The assumption, based on fishermen's reports, that landings can be equated with catch in this fishery is troublesome and unfounded because at-sea discards are not sufficiently sampled by observers. While additional sampling of any discards actually brought on board is needed, even more important are measures to quantify and qualify at-sea dumping of unsampled catch that is not currently brought on board (slippage).

A potentially better alternative to measuring discards at sea, including slippage, is to eliminate them, by mandating that all possible catch must be brought to shore for sampling. Under such a scenario, dockside monitoring would be combined with a maximized retention program that has a verification system to ensure all catch (with the exception of prohibited species and any discards necessary due to vessel safety concerns) is brought to shore, weighed and sampled by shore-based fishery observers (SBO). Video-Based Electronic Monitoring (VBEM) is the preferred verification system. It should be noted that the CCCHFA has conducted successful feasibility testing of VBEM for this purpose in the New England herring fishery (report previously submitted to NEFMC and available in the Am. 4 Scoping Comments).

Dockside monitoring alone cannot deliver the information on herring fishery impacts sought by the Council, the industry, the government, or the public. Under this proposed action, it will be paired with at-sea companion measures mandating that 99.9% of the catch is brought to shore for DSM, verifying that this is achieved, and imposing penalties and accountability measures for non-compliance. Shore based monitoring represents the most efficient and cost-effective option for quantifying and qualifying landings, as long as it is paired with at-sea measures to quantify, qualify or eliminate discards, including slipped discards.

4.2 Proposed Action Summary

Other U.S. fisheries have encountered, and solved, all the unique monitoring challenges of a high-volume, high-throughput, and fish-pump dependent fishery like the New England herring fishery. By copying the best rules, regulations, and tools from these programs, managers in New England will quickly be able to build a program that independently quantifies and qualifies all herring fishery landings (including incidental catch and bycatch) instead of relying on estimates

provided by vessels and dealers. The plan is modeled on demonstrated success in similar U.S. fisheries, in which government and industry cooperate and pool resources to preserve flexibility, yet also meet performance standards. (*See Appendix A: Monitoring Models*)

The proposed action will require modest investments in technology, personnel and infrastructure, coupled with Council and NMFS mandated standards for landings monitoring and reporting. The program has five parts: actual weight measurements, 100% DSM coverage by shore-based observers, industry-designed monitoring plans, analysis summaries, and at-sea companion measures (100% VBEM). *Appendix A (Monitoring Models)* outlines two examples of high-volume U.S. fisheries that achieve robust monitoring of landed catch, and also directs the Council towards the regulatory language that codifies these successful programs. These examples are suggested as models which illustrate the availability of technology, expertise, and technical and legal language. This knowledge can in turn help create monitoring systems that meet scientific criteria yet maintain industry flexibility.

4.3 Elements of the Proposed Maximized Retention and Dockside Monitoring Program:

- 1) **Actual Weight Measurements or Verifiable Volumetric Proxies:** It is more accurate to rely on independently verifiable actual weights from certified scales (or an approved volumetric proxy) instead of good-faith estimates made by captains and dealers. Proven technology is readily available that can deliver these data without great interference to vessel offloading operations. The preferred 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 place to place. These scales do not slow down or otherwise layer inefficiency into the offload process for the vessels or processors. The scales eliminate uncertainty inherent in the reliance on industry-generated estimates of landings and will provide scientists with accurate data. Regulations mandating the installation, maintenance and use of approved scales or other weighing techniques which can be verified by an SBO for all pelagic fishery offloads forms the first key component of this program. 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. It is important to reiterate that while some stakeholders and managers have expressed alarm over a perceived need under this scenario to “weigh every fish” this is not the case. Instead, the industry will be presented a wide 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 techniques. The NEFMC should use Amendment 4 to convert herring landings monitoring to 100% certified actual weight measurements or verifiable volumetric proxies.
- 2) **100% DSM Coverage:** Rigorous sampling of the landed fish and certification of the offload weigh-outs (census of all landing events) by certified shore-based observers forms the second critical component of the program. Previous efforts at dockside sampling undertaken by state agencies, Federal agencies, and enforcement personnel have been hampered by inconsistent funding, coverage, and protocols, lack of species-level sampling, a reliance on industry-

generated weight estimates, and voluntary participation. As a result, most data is not statistically viable for extrapolation of total impacts. 100% coverage of offloads by certified shore-based fishery observers who execute a robust protocol to derive total species-level landings composition is necessary in this fishery due to the episodic but significant nature of the bycatch events. The NEFMC should use Amendment 4 to require compliance with the 100% coverage provision, and mandate that dockside observers are granted the same access, assistance and cooperation as at-sea observers.

- 3) **Catch Monitoring and Control Plan (CMCP):** The third component will assure that the industry retains critical 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 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 NEFMC. CMCP's are currently required for the following fisheries in Alaska: American Fisheries Act Pollock, Aleutian Islands directed Pollock and certain Rockfish programs. The Council mandated standards, in turn, would outline requirements for each CMCP to include the following: sorting and weighing all landings under the oversight of the 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 most important, procedures to ensure that no unobserved pre-sorting occurs, including at-sea through the installation and operation of a VBEM system.
- 4) **Analysis and Reporting:** Finally, the fourth component 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. This will support overall efforts to better understand the impacts of the pelagic fisheries, as high-quality, real-time information will be available to scientists and managers at all levels.
- 5) **At-Sea Companion Measures:** A dockside monitoring system such as the one described herein, is a powerful tool but cannot meet the goals and objectives of Amendment 4 in and of itself. Amendment 4 will fail without a strong companion system to quantify and qualify all at-sea discards in the herring fishery, or verify that all catch is brought to shore where it can be measured and sampled by the dockside infrastructure. Amendment 4 will fail if it is based on the fishermen's word that landings equals catch. Recent examinations of at-sea observer data, especially new insights into at-sea dumping of catch (slippage) in the herring fishery, confirm this conclusion and clearly debunk the assertion that landings equal catch. The preferred alternative will mandate maximized retention and specify that all CMCP include operation of a VBEM system to verify compliance. It will also include a strict schedule of penalties for non-compliance with maximized retention or for VBEM system tampering.

4.4 Specific Management Measures for the Proposed Action

The Council would contemplate a preferred alternative for catch monitoring in the Atlantic herring fishery that would include the following measures:

- Mandatory maximized retention (target of 99.5% of all catch landed)
 - 2 categories of prohibited species
 - 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
 - Species for which the vessel is not permitted or is subject to landings limits will be addressed through a series of sub-options (**see Section 4.4.1- options to address non-permitted landings**)
- Mandatory verification of compliance with maximized retention
 - At-sea component of vessel-designed Catch Monitoring and Control Plan 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 cod-end is empty after each haul and that no fish were slipped from the cod-end while the cod-end was in the water (**see Section 4.4.2- options to address slippage**)
 - CMCP must be approved by NMFS on an annual or semi-annual basis
- Mandatory participation in 100% dockside monitoring
 - Shore-side component of CMCP 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
- 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 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 datagaps 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
- Specification of Minimum Data Standards and CMCP Approval Procedures
 - The Council will specify data collection standards that DSM provider protocols must meet, including but not limited to the following
 - All catch will be sampled and/or subsampled 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. Census-style catch sampling in a high-volume, high-throughput fishery is not adequate in and of itself. For instance, it is clearly impossible to identify all clupeids to species unless each fish is examined and thus some sort of subsampling and extrapolation will be required unless the vessel and/or dealer are sorting to the individual fish level.
 - The Council will specify CMCP elements and design parameters
 - All CMCP 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 CMCP 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
 - NMFS will approve CMCP on an annual or semi-annual basis as part of fishery permit renewal procedures

- 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
 - Deliberate interference with VBEM system operation
 - Accountability measures must be in place to account for monitoring and/or quota/bycatch cap accounting errors caused by such non-compliance.
 - See **Section 4.4.3- Options for Penalties/Accountability Measures to Address Non-Compliance**

4.4.1 Options to address non-permitted landings

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

In all scenarios under which landings of previously non-permitted catch would be allowed, it will be necessary to implement robust chain-of-custody and financial accounting procedures to ensure that the herring industry does not benefit financially from the sale of such fish in any way. Other programs have addressed this through careful program design which may include involvement of law enforcement personnel in order to essentially treat such fish the same as seized catch.

Option 1: Amend regulations, including other FMP's, to permit the 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 likely 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 Am. 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.

While this option might seem highly ambitious, it is worth mentioning that Annual Catch Limit (ACL) requirements under the MSRA likely come very close to requiring this type of cross-fishery impact measurement and mitigation already, and thus the concept of an omnibus Council solution incorporating this concept is not out of the question.

Additional sub-options address whether or not such fish landed outside current regulations could be sold, and, if so the eventual use of the revenues

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)

Sub-option 1B: Allow landing of non-permitted catch, including in excess of current trip limits, without caps (Not 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

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. The maximized retention program in the PFMC shore-based hake fishery currently operates under an EFP, as it has for approximately 7 years, although this fishery is fairly far along in the process of transitioning to a fully-approved program without annual EFP's.

Vessels wishing to participate would apply annually and NMFS would issue EFP's 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 the sub-options described above under option 1 would be applicable under option 2 and would need to be considered

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 done through a designated discard chute that is also subject to close-range CCTV scrutiny. The existing wide-angle deck-wide and rail-area cameras would essentially identify pre-sorting as they would under maximized retention, and imagery analysis would be done 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 done to identify each discarded animal to species and estimate its size and weight based on the high-quality look at it the 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 mammals or birds.

4.4.2 Options for Net Handling to Address Slippage

The preferred alternative will present a challenge in that rigorous protocols will have to be developed to address slippage (the dumping of catch directly from the cod-end without it ever being brought on board). Slippage has long been identified as one of the most serious problems in this fishery by stakeholders and the public. Recent data has not only confirmed that the practice is widespread, but that it often occurs for the specific purpose of preventing bycatch from coming aboard, even when an observer is aboard. While the classic explanation for slippage has typically been vessel safety, data seem to show that this is actually an uncommon reason for the practice. Nevertheless, accommodation must be made to allow the practice for legitimate safety reasons, and the challenge is therefore to minimize and mitigate it.

A further challenge will be to devise net-handling techniques that assure slippage does not occur and demonstrate this fact adequately such that the VBEM can verify the absence of slippage. Finally, particular attention must 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 effective pumping. These operational discards are almost certainly disproportionately high in sampling importance. They are pre-sorted because the fishery typically employs a mechanical sorting device on the pump itself, which is in turn within the cod-end, and because stratification of species has been documented in the cod-end. Therefore it is highly likely that these operational discards are not representative of what was pumped, and they must therefore be sampled carefully. By its nature slippage occurs underwater, and thus devising techniques to document it will be difficult.

Fortunately the 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.

Option 1: Each herring vessel owner designs and implements, through the CMCP, maximized retention demonstration technique for that vessel (preferred alternative)

Option 2: Industry-wide maximized retention demonstration techniques are developed by the Council and mandated through Am. 4

Option 3: Un-observable 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 fishery unobservable and the fishery would be suspended indefinitely until techniques could be developed

Sub-option 1 for Options 1 and 2: Suggestions for maximized retention demonstration

The following may be mixed, matched and combined

Sub-option 1A Interruption Prohibition

Under this sub-option, removal of the pump from the cod-end 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 cod-end was either empty or was re-purged before being placed back in the water.

Sub-option 1B Cod-end lifting

Under this sub-option the vessel would be required to lift the cod end from the water to visibly demonstrate that it was empty prior to re-setting the net

Sub-option 1C Bring Cod-end aboard

Under this sub-option the vessel would be required to bring the cod-end 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.

Section 4.4.3 Options for Penalties/Accountability Measures to Address Non-Compliance

In addition to the schedule of penalties and violations outlined above 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) a schedule of general penalties will need to be created to discourage non-compliance with the overall 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.

Many are under the mistaken impression that recent discard events in the PFMC shoreside hake fishery that led to a bycatch cap overage on certain limiting bycatch species constituted a failure of the VBEM system. This is not correct. The vessel captain apparently did manually power down the VBEM system in order to conceal a discard event, but the tamper-evident nature of the VBEM system did allow it to do its job and the data showed the power down. The key is making certain that strict regulations specify that such an incident is a violation and mandating consequences that will prevent future occurrences, and thus prevent future attempts to conceal discard events.

Option 1: Description of violations and suggested penalties/accountability measures (Preferred Alternative)

Under this option violations would be specified and penalties imposed. The following would be considered violations under the proposed action

- VBEM system tampering
- Vessel found to have been in the EEZ without an operational VBEM system
- Interference with a shore-based observer in the performance of his or her duties

- Unreported discarding and/or pre-sorting
- Failure to comply with any elements of a CMCP, including but not limited to the provision of certified landings weights or alternate measurements of landed weight.
- Fishing without an approved CMCP

Penalties must be stiff, but the exact schedule is best left up to industry and NOAA Fisheries to determine. CHOIR does suggest, however, that the proposed action is meant to provide strong assurances that landings may be safely assumed to equal catch in the fishery in the future, thereby allowing managers to track quotas and bycatch caps in near real time by simply tallying landings. Therefore any violation that leads to the discovery of a discard event after the fact and which is found to have caused a quota or cap overage must be punished in a particularly harsh manner and strong accountability measures must be in place to ensure the overage is paid back. Therefore any unreported and/or undetected discard or gap in VBEM coverage that may conceal a discard as discovered through subsequent analysis of VBEM data should result in the application of an estimated and/or assumed tonnage to all quotas and bycatch caps in the fishery, as outlined below under sub-options for option 1.

Furthermore, if the discard caused an overage, the offending vessel should be suspended from the fishery for the following fishing year and all other vessels should be forced to pay back the overage. In addition, the offending vessel should be forced to carry an at-sea observer at its own expense, in addition to participating in all aspects for the program in the proposed action, for an additional probationary year.

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

The following may be mixed, matched and combined

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 have to be based on some independent measure of the total weight of the slipped discards. Captain's good faith 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 option)

Under this preferred 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 (approximately 65 tons). 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 is harsh 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 have to be based on some independent measure of the total weight of the slipped discards. Captain's good faith 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 is harsh 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 fishery for the following fishing year and all other vessels would be forced to pay back the overage. In addition, the offending vessel would be forced to carry an at-sea observer at its own expense, in addition to participating in the maximized retention ad dockside monitoring program under the proposed action, for an additional probationary year.

Section 4.4.4 Options for Dockside Monitoring Service Providers

This section describes a series of options for the provision of DSM services. It also lays out a framework whereby this preferred 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.

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 plugged into the new monitoring program, ensuring that the data they produce is both useable and used. 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 DMR, has run 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. Specifically, it is believed that the DMR program employs a census-only catch sampling strategy, which is markedly different from the combined census and subsample approach used by NEFOP observers and is probably not adequate to identify all bycatch to species, especially those animals closely resembling Atlantic herring in size, shape and color (especially river herring and juvenile haddock). Under the proposed program's preferred 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 fortunately available to support a dramatic expansion of this program, thanks to the foresight and support of the Massachusetts legislature and Governor Deval Patrick. 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. CCCHFA and state officials hope that this program will form a critical piece of a revamped regional monitoring infrastructure for these unique fisheries.

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.

The Massachusetts program currently lacks at-sea companion measures because it was largely designed by the legislature to assist in enforcement of state landings regulations; furthermore the state has the authority to address landings, while it cannot control discards in Federal waters. As such it makes sense to create a cooperative agreement between NMFS and DMF whereby the aforementioned resources can be used to maximum effectiveness as part of a holistic monitoring plan for the fishery.

The NEFMC is presented with a unique opportunity to build upon the infrastructure Massachusetts will create by developing a preferred alternative based on dockside monitoring and verified maximized retention. Tremendous potential exists for the Amendment 4 process to encourage the development and assimilation of programs like the one in Massachusetts in the other New England states where herring is landed. The resulting collaboration and pooling of resources between state and Federal governments will create the monitoring infrastructure needed for this important fishery and the public resource on which it depends.

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 as far as the herring fishery goes, 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 Alternative 7 below for more information..

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

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

These two options describe the general process by which NMFS would permit herring vessels to contract with and thus ensure the presence of a shore-based observer if and when the government was unable or unwilling to provide one. NMFS would certify approved DSM vendors and their data management and delivery models according to recent guidelines developed for the multispecies fishery.

4.5 Narrative Explanation of Preferred Alternative

This proposal will not provide detailed explanations of VBEM technology for two reasons.

First, we assume a basic understanding at the Council level of the technology and the fact that it has undergone extensive pilot testing in New England, including a successful pilot on a herring vessel. There does, however, seem to be some confusion in that managers and fishery stakeholders do not understand the distinction between two very different uses of VBEM, one being catch identification/quantification and the other being verification of maximized retention requirements. While the former is not particularly applicable to mobile gear vessels, including midwater trawl vessels and purse seine vessels, the latter certainly is. Use of VBEM to identify, quantify, reduce and eliminate at-sea discarding on trawl vessels is both proven and efficient. It is used for that exact purpose in at least one U.S. midwater trawl fishery (Pacific Fishery Management Council shore-based whiting) and has been tested in at least several others around the world, again including the New England herring fishery.

Second, such explanations of VBEM technology are easily available in various published reports and papers, including several that have been submitted to the NEFMC as part of ongoing Am. 4 proceedings already. These reports do a far better job of not only explaining the technology, but of explaining and analyzing its use, including such difficult “soft” issues as data ownership, privacy, confidentiality, law enforcement overlap, and administrative relationships.

Those “soft” issues are sure to require time and serious discussion involving all parties. Likewise the on-the-ground technical issues of VBEM installation, operation, and training are also certain to require investments of time and effort. VBEM can’t simply be installed on the day the amendment is implemented and sent to sea. Under the preferred alternative, the industry would begin the process of further testing VBEM equipment and service models immediately, following up on the pilot work conducted by CCCHFA in 2006-2007. Infrastructure would be built slowly but steadily over the next two years so that a mature program was in place by the expected implementation date of the amendment (1/1/2009).

While the task of implementing a VBEM program is certainly challenging, a bought-in industry with strong partners can accomplish this with two years lead time.

Likewise, detailed management documents, policy analyses, and examples of regulatory language on maximized retention are available from the Pacific Fishery Management Council (PFMC) and NMFS Northwest Regional Office (NWRO) as relates to the shore-based hake fishery, and on CMCP from the North Pacific Fishery Management Council (NPFMC) and NMFS Alaska Regional Office (ARO), as well as the Electronic Code of Federal Regulations (CFR) and the Federal Register. Some examples may be found in *Appendix A (Monitoring Models)*.

Finally, and in the same spirit, additional background literature on other proposed program elements or related subjects like the Maine DMR port sampling program, certified catch weight guidelines, and DSM vendor specifications is also widely available and the proposal authors will gladly steer Council staff or interested readers towards this material.

Other Provisions

- Under this proposal, 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.
- Note that the entire proposed action, including the sections on slippage, will apply to all herring vessels including midwater trawl, pair trawl and purse seine vessels.
- 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 EM 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.
 - Field service
 - Analysis service
- The authors and supporters of this proposal recognize that while NGO's will be critical participants in building and managing the program, for instance as a facilitator between industry and VBEM and DSM vendors, CHOIR and its NGO supporters including CCCHFA are not appropriate entities for this role and will not be active partners in implementation. Furthermore, while we may be able to facilitate initial contacts between industry and monitoring vendors, and provide program design expertise based on past experience in this and other fisheries, neutral NGO's and/or herring industry NGO's are the appropriate program hosts and advocates.
- CHOIR will, however, advocate strongly for transparency in program design and implementation and for strict adherence to the data standards outlined herein.

4.6 Preliminary Impact Analysis of the Proposed Action

Detailed environmental impact analyses of the proposed action will be prepared by Council staff as part of the DSEIS provided it is selected. CHOIR is fully prepared to assist Council staff in this process as necessary and has substantial policy analysis capacity.

A lack of critical up-to-date background information on the herring fishery (effort, revenues, landings, monitoring and other data) makes a highly detailed impact analysis problematic at this time and thus for this document. Therefore the analysis presented here is preliminary, and CHOIR, along with proposal supporters, looks forward to the opportunity to assist the Council in further development and analysis of the proposed action.

4.6.1 Environmental Impacts of the Proposed Action

Biological

The proposed action will have highly positive biological impacts because for the first time, robust and timely information on catch, bycatch and landings will be available for this important fishery which targets a keystone forage species. Bycatch monitoring and reduction standards of Federal law will be met.

Economic

The proposed action will have positive long-term economic impacts because the creation of strong monitoring infrastructure will protect the herring resource and thus ensure the long-term existence of a healthy, sustainable herring fishery. Economic benefits will be realized by all users of the herring resource. There will be short-term investments required by herring industry participants that may result in some foregone profit. In addition, there will be ongoing industry contributions to monitoring that will, at least partially, impact vessel revenues.

Social

Social impacts will be positive. There is considerable strife surrounding the herring fishery at this time due to the inadequate monitoring program and ongoing bycatch concerns. The proposed action would end this by providing reliable documentation of catch and bycatch and by providing for bycatch reduction and mitigation. CHOIR hopes that the considerable time and research which was invested in this proposal will be the beginning of a new dialogue and that the herring industry will recognize that we have, for some time, been making positive contributions towards better management in the fishery.

4.6.2 Costs of the Proposed Action (Budget and Resources)

The lack of key background information on the herring fishery, especially post-Am. 1 data on effort, revenues, and landings by vessel size, permit category and landing port make program costs particularly difficult to accurately project. While fairly precise estimates of expected costs for services such as VBEM, DSM and physical infrastructure are possible, reliable application of these costs to the fleet is problematic. The necessary information is anticipated to be a part of the Am. 4 DSEIS and thus a future refinement of these analyses will certainly be possible. CHOIR looks forward to working with Council staff and stakeholders to further develop budget estimates and funding models for the proposed action.

Likewise the port sampling programs run by the states of Maine and Massachusetts, especially the latter, have been treated during Am. 4 proceedings to date as if they are officially parts of the current monitoring program, but key information on them is not available, especially expected coverage rates and per-day sampling costs.

4.6.3 Budget:

Category	Item	Cost per vessel
Infrastructure	VBEM system purchase	\$10,000
	Catch weighing equipment or services	\$10,000
	Total initial investment per vessel	\$20,000
Ongoing costs	Dockside monitoring per day/landing event	\$300
	VBEM field service per sea day	\$40
	VBEM analysis per sea day	\$250

Table 2: Preliminary Budget Information

4.6.4 Budget Narrative:

Estimates of purchase and installation costs for flow scales or hopper scales were generated through discussions with a company that provides flow scales to pelagic fisheries on the west coast. Exact final costs will vary somewhat depending on the location of the scale and the installation specifications of the industry-developed Catch Monitoring and Control Plan (CMCP). Scales typically range from \$39,000 - \$55,000. Addition of items such as conveyor belts would increase the total cost. 18 wheeler truck scales cost between \$5,000 and \$9,000 and would be an alternative option for some operators instead of flow and hopper scales. Also, certified volumetric estimates can be obtained if a vessel's holds are surveyed and measured and a calibrated measuring stick is created for each hold, and discussions with certified Canadian vendors who provide this service indicate that surveying a vessel will cost approximately \$3,000 including surveyor travel.

It should be noted that procedures can be developed to have the weighing method certified and to allow a dockside observer to effectively monitor the offloads using any of the options above: flow, hopper, truck scale, or volumetric.

As a result, we assume \$10,000 per vessel for start-up costs related to providing certified weighs or acceptable proxy measurements. We took the higher estimate of the two most likely solutions an independent vessel operator who offloads across different piers, typically to trucks, would likely choose: truck scales. If many operators chose to stick a calibrated hold, savings would likely be realized. Corporate fleets that offload to established processing plants would be more likely to choose the more expensive flow or hopper scale solution. Still, to our knowledge most if not all of this type of operation services multiple vessels and as such the cost of the scale would be spread across multiple vessels (approximately 2-4) thus making the assumption of \$10,000 per vessel reasonable.

VBEM system purchase and installation is known to cost approximately \$10,000 from data provided to the NEFMC by Archipelago during deliberations for Am. 16 to the groundfish FMP. This covers a full system with control box, cameras and sensors.

VBEM field service per sea day is estimated to be \$40 based on data from Archipelago indicating that typical annual expenditures for system maintenance and field service costs approximately \$2,000 per vessel per year. We have doubled it to account for the likelihood of increased costs to deliver this service through a New England partner and divided it by approximately 100 sea days per year, which we assume to be a typical fishing effort characterization.

VBEM analysis services are assumed to be \$250 per sea day. We base this estimate on the costs for VBEM services from Archipelago paid by vessels in the PFMC shore-based hake fishery. We believe this is a conservative estimate because the \$250 per sea day in that fishery includes VBEM system rental and the proposed action would instead feature up-front purchase of the VBEM systems. The PFMC fishery is considerably more seasonal than the New England fishery, although certain vessels might consider system rental if their herring fishing is highly confined within a calendar year.

Discussions with observer provider companies indicate that NMFS-certified, dockside third-party observers would likely cost approximately \$3300 per month. We assume a DSM could sample approximately 15 days per month and provide a further cushion for additional program management and overhead.

4.6.5 Budget Summary

Based on the above analysis we estimate that the proposed program will cost approximately \$20,000 per vessel in initial start-up costs and an additional \$45,000 per year per vessel for a vessel fishing 50 trips per year at 2 sea days per trip.

It should be noted that a possible consideration for cost savings would be to limit the proposed action to Category A and B vessels. These are the largest, most efficient vessels in the fishery and harvest approximately 95% of the TAC and earn 95% of the revenues. If this approach were taken, the overall cost of the program for those approximately 40 vessels would be approximately \$2.5 million dollars in the first year and approximately \$1.8 million dollars in subsequent years. While 9.5% of fishery revenues (based on an assumption of \$20 million dollars total fishery revenue x 95%) is a fairly steep industry contribution that would likely be unsustainable, the funding discussion below will illustrate that there are a number of innovative ways to ensure that industry does not pay all the costs, and bring their contribution down to a more acceptable level of less than 5%.

Finally, it may be helpful to consider the following fishery description (written by Howard McElderry of Archipelago) of the PFMC hake fishery that has successfully operated a system very similar to the proposed action for many years, in that it is clear the fishery is very close analogue of the New England herring fishery in terms of size, seasonality, and revenue. The very fact that the system has been made to work for them should be considered powerful evidence that it warrants consideration in New England.

“The non-tribal, commercial Pacific hake fishery is a seasonally intense spring/summer fishery that operates off the coasts of Washington, Oregon and northern California, consisting of both an at-sea processor fleet and a shore-based fleet. The shore-based fleet comprises approximately 40 vessels that make day fishing trips and deliver their catch to six ports. There is usually an early season fishery in northern California, starting early April, where up to 5% of the coast wide quota is taken. The balance of quota is taken further north during the main season fishery, which generally begins mid June off the coast of Oregon and Washington. The Pacific Fishery Management Council regulates the quota for different components of the U.S. hake fishery, and the annual quota is about 100,000 metric tons, valued at about \$25 million USD.”

Excerpted from McElderry 2008:
 “At-Sea Observing Using Video-Based Electronic Monitoring
 Prepared For:
 Electronic Monitoring Workshop
 29-30 July 2008”

4.6.6 Funding Recommendations for the Proposed Action

Funding the proposed action will certainly present a challenge, but the preliminary analyses below demonstrate that innovative long-term sources of funding are possible.

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 (\$.01 per pound)	\$1,600,000
Industry cash payments (3% of average per trip ex vessel revenue)	\$600,000
Potential Total	\$5,894,000

Table 3: Preliminary list of potential funding sources

4.6.7 Funding Narrative

The preliminary analysis in Table 3 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. As CHOIR has done in the past, we suggest that there is no more pressing ecosystem research need than fishery monitoring baseline data, and further that such monitoring is an entirely appropriate use of the money.

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 Am. 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 fishery of 100 mt based on data in the Am. 4 discussion document, and assuming an average ex-vessel price of \$.10 per pound, we assume average per trip revenues 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 OSC by NEFOP on 5/22/08) we calculate that approximately \$600,000 per year would be available.

5.0 Alternatives to the Proposed Action

5.1 Alternative 1: Status Quo (No Action)

The management infrastructure in the New England herring fishery has not kept pace with the fishing infrastructure, and is currently characterized by a lack of cohesion, chronic under-sampling, and long delays prior to the release of catch estimates. Such estimates, once released, usually lack certainty. The largest and most efficient fleet in New England is currently monitored by self-reporting, Federal at-sea observers, dockside inspections by enforcement personnel, and voluntary port sampling programs. The existing monitoring programs have inconsistent protocols and coverage rates, which lead to data extrapolation challenges. For instance, extrapolations are usually not available in a timely fashion and are often characterized by severe uncertainty. In addition, there are no regulations which mandate that landed fish are actually weighed, and as such they rarely are; instead managers rely on good-faith, volumetric estimates from captains and dealers, which do not accurately or completely account for the presence of bycatch. Finally, untold but clearly significant volumes of fish are being discarded at sea without ever being brought on board, even when an observer is present. At other times when observers are present, loopholes allow even more fish to go unsampled. Slippage, pre-sampling, and the associated unsampled catch are likely the single biggest monitoring issue in the fishery.

There is widespread agreement that in general the monitoring systems in this fishery are inadequate. Indeed, this is the very reason the NEFMC has begun work on Amendment 4 to the Herring FMP. The status quo, in which landed fish are infrequently sampled for bycatch and are never actually weighed, and are often used as a proxy for total catch, is yielding nothing but uncertainty. We simply do not know what is actually being caught in this fishery and the money currently being spent on monitoring the fishery is not providing enough return on investment. Thus The status-quo is simply not a viable option.

5.2 Alternative 2: 100% Verification by At-Sea Observers

Under this alternative, maximized retention would be verified by at-sea observers (ASO) 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 through DSM, as would the certified weighing or certified volumetric estimation of landed weight.

5.3 Alternative 3: Hybrid Option

Under this alternative, a combination of VBEM and ASO would be used to verify maximized retention. Potential sub-options include allowing industry to choose which verification vector to employ.

5.4 Alternative 4: <100% Verification Coverage

Under this alternative, 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. This option is not a viable choice. According to the PFMC, as related in the Environmental Assessment (EA) for Amendment 10 to the Pacific coast groundfish FMP, which analyzed the transition of the shore-based hake fishery from annual EFP's to a permanent maximized retention, NMFS determined "that a level of 100 percent monitoring was the only monitoring level that was appropriate for accurately documenting compliance with maximized retention" and that furthermore "NMFS believes that full EMS [VBEM] coverage is necessary to effectively deter and monitor discarding at sea." (PFMC Am. 10 Draft EA Section 2.3)

5.5 Alternative 5: <100% DSM Coverage with Extrapolation

Under this alternative 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.

5.6 Alternative 6: <100% DSM without Extrapolation

Under this alternative 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. This is not a viable option in that it is similar to status quo. DSM data would continue to be un-useable for the purpose of estimating total catch in the fishery.

5.7 Alternative 7: Phased-In Approach

Under this alternative, the proposed action would be maintained in the form described in Section 4 but instead of full implementation of the VMR/VBEM/DSM program upon implementation of

Am. 4 on 1/1/2011, 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 Am. 4 measures. This may not be possible and if so under this alternative the primary source of catch information would continue to be the NEFOP and the existing state DSM programs during the phase-in period. Therefore, the Council would mandate, and NMFS would implement provisions to ensure that during the phase-in period, NEFOP and/or state port sampling data were subject to fleet-wide extrapolation to provide total catch estimates for the fishery.

6.0 List of Preparers

The list below presents, per the request in the RFP, contact information for supporters of proposal willing to work with NEFMC on further development:

- Steve Weiner (CHOIR Coalition, Chairman)
 - See cover page
- Chris Weiner (CHOIR Coalition, Outreach and Policy Coordinator)
 - See cover page
- Tom Rudolph (CHOIR Coalition, CCCHFA)
 - See cover page
- Lara Slifka (CHOIR Coalition, CCCHFA)
 - See cover page
- Rich Ruais (CHOIR Coalition, East Coast Tuna Association)
 - (603) 898-8862 (o)
 - (603) 898-2026 (f)
 - 28 Zion Hill Rd Salem, NH 03079-151
 - Email: rruais@aol.com
- Howard McElderry (Archipelago Marine Research, LTD., Vice President)
 - (250) 383-4535 (o)
 - (250) 383-0103 (f)
 - 525 Head Street Victoria, BC V9A 5S1 Canada
 - Email: howardm@archipelago.ca

7.0 Glossary of Acronyms

ACL	Annual Catch Limit
AM	Accountability Measure
Am. 4	Amendment 4 to the Atlantic Herring Fishery Management Plan
AH	Atlantic Herring
AP	NEFMC Herring Advisory Panel
ASMFC	Atlantic States Marine Fisheries Commission
ASO	At-Sea Observer
CA I	Georges Bank Closed Area I
CA II	Georges Bank Closed Area II
CCCHFA	Cape Cod Commercial Hook Fishermen’s Association
CHOIR	Coalition for the Atlantic Herring Fishery’s Orderly, Informed, and Responsible Long-Term Development
DMF	Massachusetts Division of Marine Fisheries
DMR	Maine Department of Marine Resources
DSEIS	Draft Supplementary Environmental Impact Statement
DSM	Dockside Monitoring
EA	Environmental Assessment
EFP	Exempted Fishing Permit
EGB	Eastern Georges Bank
EIS	Environmental Impact Statement
EM	Electronic Monitoring
ESA	Endangered Species Act of 1973
EUSCA	Eastern U.S. Canada Resource Sharing Area
EVTR	Electronic Fishing Vessel Trip Report
F	Fishing Mortality
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FSEIS	Final Supplementary Environmental Impact Statement
FSO	Fisheries Statistics Office (NOAA Fisheries Northeast Regional Office)
FV	Fishing Vessel
FVTR	Fishing Vessel Trip Report
FW	Framework Adjustment to a Fishery Management Plan
FY	Fishing Year
GB	Georges Bank
GOM	Gulf of Maine
LOA	Letter of Acknowledgement
LOF	List of Fisheries
MMPA	Marine Mammal Protection Act of 1972
MSA	Magnuson-Stevens Act
MSRA	Magnuson-Stevens Reauthorization Act
mt	Metric Ton
NE	New England
NEC	Northeast Consortium
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fishery Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Marine Fisheries Service

NPFMC	North Pacific Fishery Management Council
OSC	NEFMC Herring Oversight Committee
PDT	NEFMC Herring Plan Development Team
PFMC	Pacific Fishery Management Council
RA	Regional Administrator
RFP	Request for Proposals
RH	River Herring (Alewife and/or Blueback Herring)
RSA	Research Set-Aside
RSC	NEFMC Research Steering Committee
SAP	Special Access Program
SBO	Shore-based Fishery Observer
SBRM	Standardized Bycatch Reporting Methodology Omnibus Amendment
SDC	Scientific Data Collector
SFA	Sustainable Fisheries Act of 1996
SFD	Sustainable Fisheries Division (NOAA Fisheries Northeast Regional Office)
SRP	Scientific Research Permit
TAC	Total Allowable Catch
TAL	Total Allowable Landings
VBEM	Video-Based Electronic Monitoring
WGB	Western Georges Bank
WGOM	Western Gulf of Maine Closed Area
WUSCA	Western U.S. Canada Resource Sharing Area

8.0 Appendix A (Monitoring Models)

The following two case studies are presented as examples of successful monitoring programs in other U.S. fisheries which use pelagic trawl gear including fish pumps, and in which landings are both weighed and sampled for species composition at statistically significant levels. They are suggested as mix-and-match models of technology, personnel and regulatory language that can be used to design a program in New England that will deliver robust monitoring of landings in the midwater trawl fishery without undue burden on the industry. Brief summaries of the fisheries and their monitoring programs are provided, as well as clickable links that lead to more in-depth information including actual regulations.

Case Study #1: Pacific Whiting Shore Based Mid-water Trawl Fishery

Pacific Whiting are fished using midwater trawl nets between the months of May and November. The fishery is managed by the Pacific Fishery Management Council (PFMC) in cooperation with the National Marine Fisheries Service (NMFS). Vessels are required to have a limited entry permit, which means that the fishery isn't open to everyone. There are three ways which a vessel can catch and process whiting: catcher-processor, dockside and mothership.

Regulations have been developed in all three sectors to monitor what is caught, discarded, and landed. The dockside sector most closely resembles the New England midwater trawl fisheries. In the dockside sector, landings are monitored through an ambitious program that is a cooperative effort between the PFMC, NMFS, the Pacific States Marine Fisheries Commission (PSMFC) and the states of Washington, Oregon and California. Though this plan is still evolving, there are elements of interest which the NEFMC may wish to consider. Under the current Pacific whiting regulations, first receivers (defined as people or processors who receive,

buy or accept whiting deliveries directly from whiting mid-water trawl vessels in quantities greater than 4,000 pounds) are required to follow strict regulations to ensure that all fish delivered (i.e. landed) are weighed and reported. Fish must be sorted by species prior to being weighed and after being offloaded from the vessel. Reported weights must be recorded from scales with appropriate weighing capacity ensuring that the fish are accurately weighed. First receivers are required to e-mail the weights within 24 hours of the catch being landed using special computer software provided by the National Marine Fisheries Service. First receivers are also required to sign processor agreements with the states in which they operate. These agreements generally require them to retain, at their expense, state-certified observers who sample and certify a designated minimum percentage of offloads.

Pacific Whiting Definitions:

- *Catcher-processor Sector*: A ship that catches the fish and processes it on board
- *Mothership Sector*: Vessels that process whiting, but do not catch it, working in conjunction with catcher vessels catch the fish and deliver it to the mothership
- *Shore based Sector*: vessels that harvest whiting for delivery to dockside processors or receivers.
- *Pacific whiting shoreside first receivers*: persons who receive, purchase, or take custody, control, or possession of Pacific whiting onshore directly from a Pacific whiting shoreside vessel.

Pacific Whiting Further Reading:

- Link to whiting management homepage maintained by the NMFS Northwest Regional Office: <http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/Whiting-Management/index.cfm>
- Link to complete Pacific Groundfish regulations, including Federal whiting monitoring regulations found largely in section 660.373: http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/Regulations/upload/2008%20Pink%20Pages_May08_2.pdf
- Link to the recent Federal Register Final Rule implementing new electronic reporting and scale requirements for whiting first receivers: <http://www.nwr.noaa.gov/Publications/FR-Notices/2007/upload/72FR50906.pdf>
- Link to an Environmental Assessment which contemplates new requirements for first receivers of whiting, in the context of a maximized retention program: <http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/NEPA-Documents/upload/Processor-Rule-Draft-EA.pdf>
- Link to an Environmental Assessment which contemplates new monitoring requirements for whiting vessels, in the context of a maximized retention program: <http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/NEPA-Documents/upload/Amend-10-EA.pdf>
- Link to the Shoreside Hake Observation Program website (this is the joint effort by the 3 pacific states to implement monitoring requirements for first receivers, including observer requirements: <http://www.dfw.state.or.us/MRP/hake/>
- Link to a typical Processor Agreement between a state and a whiting processor: <http://www.dfw.state.or.us/MRP/hake/Main%20Pages/Permits%20and%20Agreements/p-s/2007%20OR-Proc-state%20agreement%20FINAL.pdf>

Case Study #2: Alaska Pollock Fishery

Alaska Pollock is managed under the North Pacific Fishery Management Council and the Alaska NMFS. Pollock are caught using mid-water trawl nets. They catch approximately 2.5 billion pounds a year. Most Pollock is caught and processed at sea, but some of it is brought in whole to shore based processors. The mid-water trawl fleet is similar to the shore based processing system. Processors which receive or buy Pollock are required to submit a catch monitoring and control plan (CMCP) to NMFS that provides the following:

- How the processing plant will sort and weigh all the species caught including the number of staff, the amount and location of space for sorting and the maximum rate that catch will flow through the sorting area,
- Serial number of every scale and why that scale was chosen
- Procedures for how the scale will be tested and by whom,
- Ensure that each scale is capable of producing a printed record of the weight of each species in a delivery,
- The location where fish are removed from the vessel and where it can be initially sorted,
- Identify a location where observers can monitor the flow of fish and ensure that the area meets the observation standards
- Communication equipment that is used by plant staff and ensure that the plant will provide one to the observer,
- A scale drawing of the plant,
- Who is the designated plant liaison that orients new observers to the plant

Scales must be inspected every 12 months. Under the current regulations NMFS is able to request that a scale be tested just as long as they notify plant personnel 20 minutes prior. All fish species brought to the plant must be sorted prior to being weighed in the processing plant. Every scale is required to produce a printed report of the weight of each species in the delivery unless exempted by NMFS. The reports must be printed every 24 hours ensuring that all the delivered fish have been accurately recorded

These agreements generally require them to retain, at their expense, state-certified observers who sample and certify a designated minimum percentage of offloads.

Alaskan Pollock Fishery Further Reading

- Link to Alaska Region National Marine Fisheries Service Homepage:
<http://www.fakr.noaa.gov/>
- Link to complete set of Alaska NMFS Regulations of the Economic Exclusive Zone (EEZ). <http://www.fakr.noaa.gov/regs/>
- Link to specific Alaska NMFS Pollock fishery regulations dealing with equipment and operations, monitoring and observers
679.28-Equipment & Operational Requirements:
<http://www.fakr.noaa.gov/regs/679b28.pdf>

679.32- Groundfish and halibut CDQ catch monitoring:

<http://www.fakr.noaa.gov/regs/679c32.pdf>

679.50- Groundfish Observer Program:

<http://www.fakr.noaa.gov/regs/679e50.pdf>

679.63- Catch weighing requirements for vessels and processors:

<http://www.fakr.noaa.gov/regs/679f63.pdf>

679-Appendix Performance and Technical Requirements for Scales Used to Weigh Catch At Sea in the Groundfish Fisheries off Alaska: <http://www.fakr.noaa.gov/regs/679app.pdf>

- Link to summary written by NMFS regarding catch weighing and monitoring for the groundfish and crab fisheries: <http://www.fakr.noaa.gov/scales/default.htm>
- Link to Alaska Observer Manual, see section 9, shoreside plants and floating processors: [http://www.afsc.noaa.gov/FMA/Manual_pdfs/MANUAL_pdfs/manual2008.pdf](http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2008.pdf)