Amendment 14 Reference Supplement

Updated 6/11/12

The materials in this document were received or requested after the Council Briefing Book mail-out. An Index Follows:

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUN - 5 2012

Richard B. Robins, Jr., Chairman
Mid-Atlantic Fishery Management Council
Suite 201
800 State Street
Dover, DE 19901

Dear Rick:

We have reviewed the Draft Environmental Impact Statement (DEIS) for Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) and have evaluated the potential effectiveness and feasibility of alternatives under consideration. The Mid-Atlantic Fishery Management Council (Council) has spent a substantial amount of time developing this amendment, and there are many alternatives that offer clear improvements to the MSB FMP and can be implemented by the NOAA Fisheries Service.

We support the consideration of the following alternatives in Amendment 14:

- Expanding the requirement for weekly vessel trip reports (VTRs) to all MSB permits (Alternative 1c), consistent with reporting requirements for other Northeast Region permits;
- Expanding vessel requirements related to at-sea sampling (Alternatives 3b and 3c) to help ensure safe sampling and improve data quality;
- Establishing a river herring catch cap (Alternative 6b) to directly control river herring fishing mortality;
- Requiring 48-hour pre-trip notifications for directed mackerel trips (Alternative 1d48) and vessel monitoring systems (VMS) (Alternative 1eMack) to help facilitate monitoring and compliance for a river herring catch cap;
- Requiring daily VMS catch reports (Alternative 1fMack), which are currently required for the Atlantic herring fishery, should the New England Fishery Management Council choose to implement a companion river herring catch cap for the Atlantic herring fishery;
- Allowing the joint Sustainable Fisheries Coalition/University of Massachusetts School for Marine Science and Technology/Massachusetts Department of Marine Fisheries bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters (Alternative 4f).

Several issues that are considered in Amendment 14 have been the subject of much debate and public comment. These issues include: Increasing observer coverage; addressing net slippage; improving dealer data; and addressing river herring bycatch. NOAA Fisheries Service supports improvements to fishery dependent data collections, be it through expansion of monitoring at sea, or greater quality assurance of the dealer data. We also share the Council's concern for reducing bycatch and unnecessary discards, and appreciate the Council's work on addressing these issues.

However, some specific alternatives in Amendment 14, if adopted, would require still more thought, more robust rationale, and further justification by the Council. As we have commented previously,

we share the Council's desire/need to have better data about these fisheries, and we support the motive and concept of the alternatives that aim to do this. However, we must be mindful of the burden and technical details of implementing the alternatives. Additionally, we cannot give our full support for alternatives for which the agency is not likely to have sufficient resources to execute.

The following sections detail our concerns with the specified alternatives. I have noted in this section which alternatives we believe require further justification by the Council, and those that we believe have serious implementation issues that we cannot overcome.

Vessel Reporting Measures (Alternative Set 1)
We are generally supportive of the vessel reporting alternatives that are necessary to ensure the effectiveness and feasibility of the programs the Council selects in this Amendment. We urge the Council to weigh each program proposed in Amendment 14 in its entirety and consider how the program will be administered and monitored moving forward.

Dealer Reporting Measures (Alternative Set 2)
Dealers are currently required to report the weight of purchased fish. A variety of methods are used by dealers to determine the weight of fish, including weighing fish on scales and estimating weight based on volumetric measures. Without verification of scale accuracy and readouts, alternatives that require dealers to weigh all fishing using a scale (Alternatives 2c-2f) may not provide substantial enough improvements to data to justify the cost. Because Alternative 2g allows dealers to continue using scales and/or volumetric estimates to determine the weight of fish, there is no appreciable difference between Alternative 2g and status quo.

Alternatives 2c-2f require dealers to document how they estimate the relative composition of mixed catch in order to facilitate quota monitoring. However, this qualitative information cannot be incorporated into quota monitoring because we use the weights provided by the dealers, regardless of the methods used to determine weights. Additionally, we are unable to evaluate, either annually or for individual transactions, the sufficiency of the information submitted.

Alternative 2b requires vessel owners/operators to review and validate catch data for their vessels in Fish-On-Line. This alternative has the potential to improve quota monitoring and year-end catch determinations by highlighting data reporting issues. However, vessels are currently able to review both vessel and dealer reported data via Fish-On-Line and discover data issues. The Council should consider whether the utility of Alternative 2b outweighs the additional reporting and administrative burden associated with the requirement.

The Council should also be aware that, if these any of these alternatives are made mandatory, they would become compliance measures that would affect future vessel permit issuance (similar to VTR and VMS compliance).

At-Sea Observation Optimization Measures (Alternative Set 3)
I am concerned about the effectiveness and legal justification for the alternatives designed to reduce slippage events in the mackerel and longfin squid fisheries. Alternatives that require trip termination lack a well explained basis for the threshold to trigger trip termination (i.e., Alternatives 3k-3n, either 5 or 10 slippage events per season or trimester). The trip termination triggers require a clear and supportable rationale and justification. Once the threshold to trigger trip termination has been reached, all vessels that slip catch, regardless of the reason for slipping (including safety or

mechanical failure), would be required to return to port. The Council must provide sufficient rationale for requiring vessels to terminate a trip after the trigger while allowing the specified number of slippage events prior to the trigger without consequence. Further, trip termination alternatives may create the situation of the vessel operator having to choose between trip termination or bringing catch aboard the vessel despite a safety concern or mechanical failure. Such a provision must be consistent with National Standard 10 of the Magnuson-Stevens Fishery Conservation and Management Act and requires additional detailed explanation from the Council. For NOAA Fisheries Service to approve a measure like this, the Council must provide a rational basis that we can support in relation to requirements of the Magnuson-Stevens Act, the Administrative Procedure Act, and other applicable law.

Additionally, we are concerned that slippage requirements are triggered when an observer is aboard the vessel. Requirements for a vessel to terminate a trip should not depend on the presence of an observer. NOAA Fisheries Service acknowledges that observes are helpful when evaluating compliance with slippage requirements, but implementing requirements contingent on the presence of an observer unduly places the observer in a compliance/enforcement role and creates the potential for conflict between the vessel's crew and the observer.

We also do not believe there is utility in requiring released catch affidavits for slippage events, as the affidavit will not provide any new information that is not currently reported by the observer program. We recently implemented protocols for observers to collect detailed information on discards, including slippage, in the herring and mackerel fisheries, such as why catch was discarded, the estimated amount of discarded catch, and estimated composition of discarded catch. Given this new data collection, requiring vessel operators to complete a slipped catch affidavit whenever catch is slipped and an observer is aboard is an unnecessary reporting burden for the industry. As we strive to improve management of the mackerel fishery, observer data, both on discards and slipped catch, are the best information to understand and account for discarding.

Port-side and Other Sampling/Monitoring Measures (Alternative Set 4)
NMFS agrees that while at-sea observers are essential for monitoring river herring and shad discards, port-side sampling is an efficient, cost-effective way to enhance the characterization of retained river herring and shad catch. Though Amendment 14 proposes industry funding to cover the port-side sampling, we estimate the cost to implement the infrastructure component of a port-side sampling program to be significant. Unfortunately, we do not have the available resources to administer the infrastructure components of this new program, given our budgetary constraints.

At-Sea Observer Coverage Requirements (Alternative Set 5)
Amendment 14 includes alternatives that increase the level of observer coverage in the mackerel and longfin squid fisheries using NOAA Fisheries Service or industry funds to support the additional coverage. While we share the Council's interested in improving fishery dependent data quality, our current and anticipated budgets do not provide support for expanded levels of observer coverage. The available funds must be distributed for observers in all of our Northeast fisheries, and we are under pressure to increase coverage levels in all fisheries. We simply cannot afford to support any alternatives that increase the observer coverage level in the mackerel or longfin squid fisheries under agency funding. We acknowledge that the analysis in the Amendment 14 document demonstrates that an industry-funded observer program would put substantial financial burden on the mackerel and longfin squid industries. If the Council proceeds with an industry funded option, it must carefully weigh the benefits of such a program with the costs to the industry.

Alternatives to Address River Herring/Shad Bycatch and Catch (Alternative Sets 6-8)
Analyses in the DEISs for MSB Amendment 14 and the New England Fishery Management Council's Amendment 5 to the Atlantic Herring Fishery Management Plan (Herring FMP) suggest that time/area management alternatives considered in Amendment 14 are unlikely to effectively minimize the bycatch of river herring due to the variable distribution of river herring. Analyses in Amendment 14 suggest that time/area management for river herring would require the use of large areas to ensure that time/area management was not just redistributing fishing effort, possibly in a way that increased river herring catch. Maps of Northeast Fisheries Science Center spring and fall survey catches indicate that the seasonal and inter-annual distribution of river herring is highly variable in time and space. River herring distribution is highly variable because they undergo extensive coast-wide migrations, largely influenced by water temperature. In addition, the incidental catch of river herring/shad and effort pattern of fleets encountering river herring/shad (i.e., midwater trawl, small-mesh bottom trawl) are also highly variable in time and space because those fleets target species that are highly migratory (e.g., herring, mackerel, squid, whiting).

To address our concerns about time/area closures, a river herring catch cap would be the most effective alternative in Amendment 14 at controlling the catch of river herring. Further, due to the mixed nature of the Atlantic herring and mackerel fisheries, especially during January through April in Atlantic Herring Management Area 2, the potential for the greatest river herring catch reduction would come from the implementation of a joint river herring catch cap for both the Atlantic herring and mackerel fisheries. A catch cap has the potential to directly control river herring fishing mortality with less compliance and administrative burden than time/area management.

In addition, the Council should carefully consider whether the benefits of river herring catch cap for the longfin squid fishery, or a shad cap for the mackerel or longfin squid fishery, outweigh the costs, especially given the scale of shad catch (125,000 lb per year, 2006-2010) compared to river herring catch (1,000,000 lb per year, 2006-2010), and the relative contribution of Mid-Atlantic small-mesh bottom trawl fisheries to total river herring and shad mortality (5% and 11.5% of total mortality, respectively).

Addition of River Herring/Shad as "Stocks in the Fishery" in the MSB FMP (Alternative Set 9)

The DEIS for Amendment 14 includes alternatives that would initiate Council action to consider adding, in a future action, alewife, blueback, American shad, and/or hickory shad as stocks in the MSB FMP (Alternative Set 9). These alternatives are not true alternatives under NEPA because they do not result in any NOAA Fisheries Service action. Rather, they would initiate a future Council amendment that would consider and analyze various management reference points, to describe and delineate EFH, and to prescribe appropriate conservation management objectives and measures. If the Council determines that it should consider adding alewife, blueback, American shad, and/or hickory shad as stocks in the MSB FMP, consistent with Alternative Set 9, we advise that the Council should initiate an amendment in a motion at the June Council meeting. My staff can communicate with your staff regarding any necessary adjustments to the final environmental impact statement (FEIS) to reflect this course of action.

Should the Council choose to initiate an amendment to consider adding river herring/shad as stocks in the MSB FMP, we urge you to work collaboratively with the New England Fishery Management

Council to develop options for potential management programs. Both the herring and MSB species interact with river herring and shad, and a management program would need to include consideration of interactions across both FMPs. In addition, there can only be one lead Council for the river herring/shad species. The recommendation as to which Council will take the lead on a river herring/shad FMP should be included in your joint deliberations.

In summary, I urge the Council to select alternatives that effectively monitor and minimize bycatch in the mackerel and longfin squid fisheries, and do not significantly expand the compliance and administrative burden of these fisheries, without a commensurate benefit to data quality. Alternatives in Amendment 14 have complimentary alternatives in the Amendment 5 to the Atlantic Herring FMP. Given the significant overlap between the Atlantic herring and mackerel fisheries, we urge both Councils to select similar alternatives regarding monitoring and addressing river herring/shad bycatch.

Finally, various reviewers noted technical issues with the draft environmental impact statement that will need to be addressed in the FEIS. My staff will provide those comments directly to Council staff. I appreciate the time and effort that the Council and Council staff have put into this amendment and I look forward to working with the Council to complete this action.

Sincerely,

Daniel S. Morris
Acting Regional Administrator

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUN - 5 2012

C.M. "Rip" Cunningham, Jr., Chairman
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Rip:

We have reviewed the Draft Environmental Impact Statement (DEIS) for Amendment 5 to the Atlantic Herring Fishery Management Plan (Herring FMP) and have evaluated the potential effectiveness and feasibility of the alternatives under consideration. The New England Fishery Management Council (Council) has spent years developing this amendment, and there are many alternatives that offer clear improvements to the Herring FMP and can be implemented by NOAA Fisheries Service.

We support the consideration of the following alternatives in Amendment 5:

- Modifying the herring transfer at-sea and offload definitions to better document the transfer of fish;
- Expanding the possession limit restrictions to all vessels working cooperatively, consistent with requirements for pair trawl requirements;
- Eliminating the vessel monitoring system (VMS) power down provision for limited access herring vessels, consistent with VMS provisions for other fisheries;
- Establishing an "At-Sea Herring Dealer" permit to better document the transfer and purchase of herring;
- Allowing vessels to enroll as herring carriers with either a VMS declaration or letter of authorization;
- Expanding pre-trip and pre-landing notification requirements, as well as adding a VMS gear declaration, to all limited access herring vessels to help facilitate monitoring;
- Reducing the advance notice requirement for the pre-trip notification from 72 hours to 48 hours;
- Expanding vessel requirements related to at-sea sampling to help ensure safe sampling and improve data quality;
- Establishing a river herring catch cap in a future framework to directly control river herring fishing mortality; and
- Allowing the joint Sustainable Fisheries Coalition/University of Massachusetts School for Marine Science and Technology/Massachusetts Department of Marine Fisheries bycatch avoidance program to investigate providing real-time, cost-effective information on river herring distribution and fishery encounters.

Several issues that are considered in Amendment 5 have been the subject of much debate and public comment. These issues include: Increasing observer coverage; addressing net slippage;

improving dealer data; addressing river herring bycatch; and addressing midwater trawling in groundfish closed areas. NOAA Fisheries Service supports improvements to fishery dependent data collections, be it through expansion of monitoring at sea or greater quality assurance of the dealer data. We also share the Council's concern for reducing bycatch and unnecessary discarding, and appreciate the Council's work on addressing these issues.

However, some specific alternatives in Amendment 5, if adopted, would require still more thought, more robust rationale, and further justification by the Council. As we have commented previously, we share the Council's desire/need to have better data about the fishery, and we support the motive and concept of the alternatives that aim to do this. However, we must be mindful of the burden and technical details of implementing the alternatives. Additionally, we cannot give our full support for alternatives for which the agency is not likely to have sufficient resources to execute.

The following sections detail our concerns with the specified alternatives. I have noted in this section which alternatives we believe require further justification by the Council and those that we believe have serious implementation issues that we cannot overcome.

Alternatives to Allocate Observer Coverage

Amendment 5 includes alternatives that increase the level of observer coverage in the herring fishery using NOAA Fisheries Service or industry funds to support the additional coverage. While we share the Council's interest in improving fishery-dependent data, our current and anticipated budgets do not provide support for expanded levels of observer coverage. The available funds must be distributed for observers in all of our Northeast fisheries, and we are under increasing pressure to increase observer coverage in all fisheries. We simply cannot afford to support any alternatives that increase the observer coverage level in the herring fishery under agency funding. We acknowledge that the analysis in Amendment 5 demonstrates that an industry-funded observer program would put substantial financial burden on the herring industry. If the Council proceeds with an industry-funded observer program, it must carefully weigh the benefits of such a program against the costs to the industry.

Under the industry-funded observer program alternative, Amendment 5 contains a Sub-Option that would exempt states from observer service provider requirements. To ensure data quality standards, we believe that all observer service providers should be held to the same requirements. The requirements include such things as standards of conduct, reporting requirements, conflict of interest statements, and emergency action plans. I therefore recommend that the Council adopt the alternative that requires states to comply with all observer service provider requirements.

Alternatives to Address River Herring Bycatch

Analyses in the DEISs for Herring Amendment 5 and the Mid-Atlantic Fishery Management Council's Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish FMP (MSB FMP) suggest that time/area management alternatives considered in Amendment 5 are unlikely to effectively minimize the bycatch of river herring due to the variable distribution of river herring. Analyses in Amendment 14 suggest that time/area management for river herring would require the use of large areas to ensure that time/area management was not just redistributing fishing effort, possibly in a way that increased river herring catch. Maps of Northeast Fisheries Science

Center spring and fall survey catches indicate that the seasonal and inter-annual distribution of river herring is highly variable in time and space. River herring distribution is highly variable because river herring undergo extensive coast-wide migrations, largely influenced by water temperature. In addition, the incidental catch of river herring and effort pattern of fleets encountering river herring (i.e., midwater trawl, small-mesh bottom trawl) are also highly variable in time and space because those fleets target species that are highly migratory (e.g., herring, mackerel, squid, whiting).

To address our concern about time/area management, a river herring catch cap, implemented through a future framework, would be the most effective alternative in Amendment 5 at controlling the catch of river herring. Further, due to the mixed nature of the herring and mackerel fisheries, especially during January through April in Herring Management Area 2, the potential for the greatest river herring catch reduction would come from the implementation of a joint river herring catch cap for both the herring and mackerel fisheries. A catch cap has the potential to directly control river herring fishing mortality with less compliance and administrative burden than time/area management.

Alternatives to Address Net Slippage

I am concerned about the effectiveness and legal justification for the alternatives designed to reduce slippage events in the herring fishery. Alternatives that require trip termination and/or catch deduction lack a well explained basis for the threshold to trigger trip termination (i.e., either 5 or 10 slippage events in a management area) and the amount of catch deduction (i.e., 100,000 lb). Both the termination trigger and the catch deduction require clear and supportable rationale and justification. Once the threshold to trigger trip termination has been reached, all vessels that slip catch, regardless of the reason for slipping (including safety or mechanical failure), would be required to return to port. The Council must provide sufficient rationale for requiring vessels to terminate a trip after the trigger while allowing the specified number of slippage events prior to the trigger without consequence. Further, the trip termination alternatives may create the situation of the vessel operator having to choose between trip termination or bringing catch aboard the vessel despite a safety concern or mechanical failure. Such a provision must be consistent with National Standard 10 of the Magnuson-Stevens Fishery Conservation and Management Act and requires additional detailed explanation from the Council. For NOAA Fisheries Service to approve a measure like this, the Council must provide a rational basis that we can support in relation to requirements of the Magnuson-Stevens Act, the Administrative Procedure Act, and other applicable law. Additionally, we are concerned that slippage requirements are triggered when an observer is aboard the vessel. Requirements for a vessel to terminate a trip or report a slippage deduction (i.e., 100,000 lb) should not depend on the presence of an observer. NOAA Fisheries Service acknowledges that observers are helpful when evaluating compliance with slippage requirements, but implementing requirements contingent on the presence of an observer unduly places the observer in a compliance/enforcement role and creates the potential for conflict between the vessel's crew and the observer.

We also do not believe there is utility in requiring released catch affidavits for slippage events, as the affidavit will not provide any new information that is not currently collected by NEFOP. NEFOP recently implemented protocols for observers to collect detailed information on discard,

including slippage, in the herring and mackerel fisheries, such as why catch was discarded, the estimated amount of discarded catch, and estimated composition of discarded catch. For 2010, NOAA Fisheries Service determined the amount of discards in the herring fishery by extrapolating observer data to the entire herring fishery. The amount of observed herring discards ("Atlantic herring" and "herring not known") was divided by the amount of observed fish landed. That discard ratio was then multiplied by the amount of all fish landed for each trip to calculate total amount of herring discards in 2010. The amount of discards was determined for each management area and gear type. Given this new data collection, requiring vessel operators to complete a slipped catch affidavit whenever catch is slipped and an observer is aboard is an unnecessary reporting burden for the industry. As we strive to improve management of the herring fishery, observer data, both on discards and slipped catch, are the best information to understand and account for discarding.

Reporting Requirements for Dealers
Dealers are currently required to report the weight of purchased fish. A variety of methods are used by dealers to determine the weight of fish, including weighing fish on scales and estimating weights, based on volumetric measures. Because Option 2 allows dealers to continue using scales and/or volumetric estimates to determine the weight of fish, there is no appreciable difference between Option 2 and status quo.

Sub-Options 2A and 2B require dealers to document how they estimate the relative composition of mixed catch in order to facilitate quota monitoring. However, this qualitative information cannot be incorporated into quota monitoring because we use the weights provided by the dealers, regardless of the methods used to determine weights. Additionally, we are unable to evaluate, either annually or for individual transactions, the sufficiency of the information submitted.

Sub-Option 2C requires vessel owners/operators to review and validate catch data for their vessels in Fish-On-Line. This Sub-Option has the potential to improve quota monitoring and year-end catch determinations by highlighting data reporting issues. However, vessels are currently able to review both vessel and dealer reported data via Fish-On-Line and discover data issues. The Council should consider whether the utility of Sub-Option 2C outweighs the additional reporting and administrative burden associated with the requirement.

The Council should also be aware that if any of these Sub-Options become requirements, they would also become compliance measures that would affect future vessel permit issuance (similar to vessel trip report and VMS compliance).

Alternatives to Address Midwater Trawl Access to Groundfish Closed Areas
Amendment 5 considers an alternative that would prohibit midwater trawling in groundfish closed areas, unless the vessel has an experimental fishing permit. Analyzes in the DEIS suggest that midwater trawl vessels are not catching significant amounts of groundfish either inside or outside the groundfish closed areas. Additionally, the majority of groundfish bycatch by midwater trawl vessels is haddock, and the catch of haddock by midwater trawl vessels is already managed through a haddock catch cap. The data do not indicate that prohibiting midwater trawling in groundfish closed areas is necessary for groundfish conservation.

In summary, I urge the Council to select alternatives that effectively monitor herring, minimize bycatch in the herring fishery, and do not significantly expand the compliance and administrative burden of the herring fishery without a commensurate benefit to data quality. Alternatives in Amendment 5 have complimentary alternatives in the Amendment 14 to the MSB FMP. Given the significant overlap between the herring and mackerel fisheries, I also encourage the Council to consider the recommendations by the Mid-Atlantic Fishery Management Council on Amendment 14 to the MSB FMP when recommending monitoring and bycatch measures for Amendment 5.

Finally, various reviewers noted technical issues with the DEIS that will need to be addressed in the final EIS. My staff will provide those comments directly to Council staff. I appreciate the time and effort that the Council and Council staff have put into this amendment and I look forward to working with the Council to complete this action.

Sincerely,

Daniel S. Morris
Acting Regional Administrator

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. "Rip" Cunningham Jr., *Chairman* | Paul J. Howard, *Executive Director*

HERRING COMMITTEE MOTIONS

Herring Committee Meeting

Radisson Hotel, Plymouth MA

June 6, 2012

CATCH MONITORING AT-SEA

(PINK SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT)

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

1. Recommend to the Council as a preferred alternative for Section 3.2.1 Alternative 2, 100% coverage on Category A and B and C herring vessels, coupled with the Herring AP recommendation for Funding Option 2 – Federal and Industry Funds– with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the States as service providers

   MOTION CARRIED 7-3-1.

2. Move that a waiver for an at-sea observer be granted for a fishing trip if NEFOP cannot provide an observer within 24 hours of the vessel's notification of the prospective trip. A waiver will not be granted if the trip is to include tows in areas and at times associated with measures to avoid or protect river herring

   MOTION CARRIED 9-0-1.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.2 – Measures to Improve/Maximize Sampling At-Sea)

3. That the Committee recommend as a preferred alternative, Section 3.2.2, Option 2, Sub-Options 2A-2F, p. 30 of the public hearing document

   MOTION CARRIED 9-0-1.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.3 – Measures to Address Net Slippage)

4. That for Section 3.2.3, Measures to Address Net Slippage the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions Trip Termination after ten slippage events by each gear type – midwater trawl (single and paired), purse seine, and bottom trawl (with an added exception for slippage under #3 spiny dogfish clogging the pump for all gear types).

   Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.

   MOTION CARRIED 7-1-2.

Other Measures to Address Catch Monitoring At-Sea (Section 3.2.4 – Maximized Retention Alternative)

5. That the Committee recommend as a preferred alternative, Section 3.2.4, Option 1 – No Action

   MOTION CARRIED 9-1-1.

PROPOSED ADJUSTMENTS TO THE FISHERY MANAGEMENT PROGRAM

(BLUE SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

6. Recommend that the Council adopt Section 3.3.1B – Proposed Regulatory Definitions

   MOTION CARRIED 10-0-1.

7. Recommend as a preferred alternative Section 3.1.2B – Proposed Administrative/General Provisions – Including 2A, 2B, and 2C

   MOTION CARRIED 10-0-1.

8. Recommend as a preferred alternative Section 3.1.3.2 Option 3 – Dual Option for Carriers (VMS or LOA)

   MOTION CARRIED 10-0-1.

9. Recommend as a preferred alternative Section 3.1.3.3 Option 3 – Prohibit Transfers At Sea to Non-Permitted Vessels

   MOTION CARRIED 9-1-0.

10. Recommend as a preferred alternative Section 3.1.4 Option 2 – Modify and Extend Pre-Trip Notification Requirements AND in Section 3.1.4, Option 3 – Extend Pre-Landing Notification Requirement

MOTION CARRIED UNANIMOUSLY.

11. Recommend as a preferred alternative Section 3.1.5 Option 2 with Sub-Option 2B – require dealers to accurately weigh all fish and require documentation for individual landings submissions on how species composition of mixed catch is estimated.

MOTION CARRIED UNANIMOUSLY.

12. Recommend as a preferred alternative Section 3.1.6 Option 2 for Limited Access Mackerel permit holders (all three tiers) – 20,000 pound possession limit in Areas 2/3 for vessels that also possess a limited access mackerel permit, and that the possession limit could be adjusted in the future through the specifications process

MOTION CARRIED UNANIMOUSLY.

13. To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next fishing trip unless there is confirmation by an observer or enforcement of weight on board that will be offloaded at the time of the next landing event.

MOTION CARRIED 6-1-2.

MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH (GREEN SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

14. Recommend Section 3.3.5 on p. 59 of the public hearing document for a river herring catch cap, which the Council would consider through a framework adjustment

MOTION CARRIED 6-0-3.

15. To recommend as a preferred alternative to address river herring bycatch Alternative 2, Option 4 – Two-Phase Bycatch Avoidance Approach based on SMAST/SFC Project.

MOTION CARRIED UNANIMOUSLY.

MEASURES TO ADDRESS MIDWATER TRAWL ACCESS TO GROUNDFISH CLOSED AREAS

(PURPLE SECTION OF AMENDMENT 5 PUBLIC HEARING DOCUMENT

16. Recommend Alternative 4, Option 4A for midwater trawl access to groundfish closed areas – Apply Closed Area I Provisions with 100% Observer Coverage, to all current year-round closed areas.

    MOTION CARRIED 9-1-0.

HERRING AMENDMENT 5 COMMITTEE MEETING

DRAFT MOTIONS 6-6-12

Catch Monitoring Alternatives:

MOTION Terry Stockwell/Mary Beth Tooley: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry.

MOTION AMENDED: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, **and Option 2 to authorize the states as service providers.**

MOTION TO AMEND: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B **and C** herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the states as service providers. MOTION TO AMEND: 6, 4, 1 abstention: motion passes.

MOTION: Recommend to the Council as a preferred alternative for Section 3.2.1, Alternative 2, 100% observer coverage on Category A and B and C herring vessels. Along with AP recommendation for funding, Option 2, federal and industry funds with a maximum contribution of $325 per sea day by the fishing industry, and Option 2 to authorize the states as service providers. MOTION: 7, 3, 1 in favor. MOTION CARRIES

MOTION: Dave Pierce/Terry Stockwell Move that a waiver for an at sea observer be granted for a fishing trip if NEFOP cannot provide an observer within 24 hours of the vessel's notification of the prospective trip. A waiver will not be granted if the trip is to include tows in areas and at times associated with measures to avoid or protect river herring. MOTION: 9, 0, 1 Motion Passes (Berg missing)

MOTION: Mary Beth Tooley/Terry Stockwell. That the committee recommend as a preferred alternative, Section 3.2.2, Option 2, Sub-Options 2A through 2F, measures to improve sampling. Motion carried 9-0-1.

MOTION: Mary Beth Tooley/Terry Stockwell. That the Committee recommend as a preferred alternative, Section 3.2.4, Alternative 1 (No Action) MOTION CARRIES 9, 1, 1.

Measures to Address Net Slippage 3.2.3

MOTION: Dave Pierce/Glen Libby. Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4B Closed Area I Provisions with Catch Deduction (100,000 pounds) and Trip Termination after ten slippage events.

MOTION TO SUBSTITUTE: Terry Stockwell/?. Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions and Trip Termination after ten slippage events by each gear type (midwater trawl single, midwater trawl paired, purse seine, bottom trawl (with an added exception for #3 spiny dogfish clogging the pump). *Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.*

MOTION: Move that For Section 3.2.3, Measures to Address Net Slippage, the Committee recommend Option 4, Sub-Option 4C Closed Area I Provisions and Trip Termination after ten slippage events by each gear type (single and paired midwater trawl, purse seine, bottom trawl (with an added exception for #3 spiny dogfish clogging the pump). *Language will be modified to reflect requirements for all gear types and for vessels that do not pump fish.* Motion CARRIES 7, 1, 2.

Section 3.3.3.1 Regulatory Definitions

MOTION: Dave Pierce/Terry Stockwell. Recommend that the Council adopt Section 3.3.1B Proposed regulatory Definitions . Motion Carries 10, 0, 1.

MOTION: Terry Stockwell/Mary Beth Tooley: Recommend as a preferred alternative Section 3.1.2.B Proposed Administrative/General Provisions Including 2A, 2B, and 2C. Motion Carries 10, 0, 1

MOTION: Mary Beth Tooley/Terry Stockwell: Recommends as a preferred alternative Section 3.1.3.2.3 Option 3 Dual Option for Carrieres (VMS or LOA). Motion Carries 10, 0, 1

MOTION: Mary Beth Tooley/Erling Berg: Recommend as a preferred alternative Section 3.1.3.3 Option 3 Prohibits transfers at sea to non-permitted vessels.

MOTION To Substitute: Dave Pierce./Peter Kendall: Recommend as preferred alternative Section 3.1.3.3 Option 1-No Action Motion Fails 2, 8, 0

MOTION Mary Beth Tooley/Erling Berg: Recommend as a preferred alternative Section 3.1.3.3 Option 3 Prohibits transfers at sea to non-permitted vessels. Motion carries 9, 1, 0

3.1.4 Trip Notification Requirements

MOTION MBT/Erling Berg: Recommend as a preferred alternative Section 3.1.4 Option 2 to modify and extend the pre-trip notification requirements and 3.1.4 Option 3 to extend the pre-landing notification requirements. Motion carries unanimously**.**

3.1.5 Dealer Reporting Requirements

MOTION Terry Stockwell/Mary Beth Tooley : Recommend as a preferred alternative Section 3.1.5 Option 2 with sub-Option 2B to require dealers to accurately weigh all fish and require documentation for individual landings submissions on how species composition of mixed catch is estimated. Motion carries unanimously.

MOTION Mary Beth Tooley: That Atlantic herring vessels be required to file a single VTR per trip, by statistical area, that lists any at sea transfers on that trip.

MOTION WITHDRAWN by MBT.

MOTION Terry Stockwell/Mary Beth Tooley: To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next trip.

MOTION: Dave Pierce/Peter Kendall .To table the previous motion until after the break. Motion carries unanimously.

3.1.6 Changes to Open Access Permit Provisions for the Limited Access Mackerel Fishery

MOTION Mary Beth Tooley/Erling Berg Recommends as a preferred alternative Section 3.1.6 Option 2 for the limited access mackerel permit holders (Tiers 1, 2, 3), 20,000 pound possession limit in Areas 2/3 for vessels that also possess a limited access mackerel permit and this possession limit could be adjusted in the future through the specifications process. Motion carries unanimously.

MOTION to remove the previous motion from the table. Unanimous.

TABELED MOTION RECONSIDERED AND PERFECTED To require that all herring vessels must offload all fish before leaving the dock prior to the start of the next fishing trip unless there is confirmation by an observer or enforcement of weight on board that will be offloaded at the time of the next landing event. Motion Carried 6, 1, 2.

Measures to Address River Herring Bycatch Section 3.3

MOTION Dave Pierce/Mark Gibson: That for Measures to Address River Herring Bycatch the committee recommend:

(1) Alternative 3 River Herring Protection Section 3.3.3.2 Option 1 (Closure Areas) for the three designated ¼ degree squares north of 4130 N Latitude to be closed during the bimonthly periods described on pg. 54 of the public hearing document for Amendment 5 and
(2) Alternative 2 River Herring Monitoring/Avoidance Approach Based on SFCSMAST/DMF Project) applied to bimonthly monitoring/avoidance areas described on page 41 of the public hearing document for Amendment 5. (Except for three designated ¼ degree squares north of 4130 N Latitude where river herring protection measures apply.
(3) If the Bycatch Avoidance Approach is discontinued for any reason (e.g.funding) then the following would be implemented in its place:
    a. Alternative 3: Protection Areas Option 1 (Closed Area) only for the ¼ degree square off the eastern shore of Cape Cod from November through February and then
    b. Alternative 3 Option 2 (Trigger Based Closed Areas) Sub-option 3C (mean) for catch triggers in the GOM (127,100 lb) and Southern New England (478,500 lb) for all other designated bi-monthly closures of river herring protection areas. Reporting Option 1: Report Total Catch by Trigger Area is recommended.

MOTION FAILS 3, 7, 0

MOTION Dave P/Frank Blout: To Recommend (1) Alternative 3, River Herring Protection, Option 1 – Closed Areas for the ¼ degree square areas on the Eastern side of Cape Cod and (2) Alternative 2, River herring monitoring and avoidance, Option 4, Two Phase Bycatch Avoidance Approach based on SMAST, applied to all other bimonthly Montoring/Avoidance Areas described on page 41 of the public hearing document for Amendment 5. MOTION FAILS 3,6,1

MOTION Mary Beth Tooley/Glen Libby: To Recommend Section 3.3.5 on Pg 59 of the public hearing document for a River Herring Catch Cap which the Council would Consider through a Framework Adjustment. MOTION Carries 6,0,3.

MOTION Terry Stockwell/Peter Kendall: To Recommend as a preferred alternative, Alternative 2, Option 4, a Two Phase Bycatch Avoidance Approach based on SMAST/SFC Project. MOTION Carries Unanimously.

Section 3.4 Midwater Trawl Access to Groundfish Closed Areas

MOTION Terry Stockwell/Howard King: To recommend Alternative 4, Option 4A for midwater trawl access to groundfish closed areas. Apply Closed Area I Provisions with 100% Observer Coverage, to all of the current year round closed areas. MOTION Carries 9, 1, 0.

MOTION Mary Beth Tooley/Terry Stockwell: Recommend that the industry funded at sea observer program be developed through a work group that includes the Agency, Council, and the industry. The work group shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. This will apply to all permit categories approved for observer coverage allocations in Amendment 5.

MOTION PERFECTED (FRIENDLY) Mary Beth Tooley/Terry Stockwell: Recommend that the industry funded at sea observer program be developed through an ad hoc Committee that includes the Agency, Council, and the industry. The ad hoc Committee shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. Waivers will be issued when observers cannot be deployed during the development of the program. This will apply to all permit categories approved for observer coverage allocations in Amendment 5.

MOTION TO AMEND Peter Kendall/Frank Blount: To add: Also, waivers would not be issued for midwater trawl vessels fishing in groundfish year round closed areas (if 100% coverage is required in the closed areas). MOTION Carries 5, 3, 1

INSERTED INTO MAIN MOTION: Recommend that the industry funded at sea observer program be developed through an ad hoc Committee that includes the Agency, Council, and the industry. The ad

hoc Committee shall meet to develop the initial recommendations to the Council by January 2013. When Amendment 5 is implemented, interim measures will include herring industry contributions of $325 per sea day to supplement federal funds. Waivers will be issued when observers cannot be deployed during the development of the program. Also, waivers would not be issued for midwater trawl vessels fishing in groundfish year round closed areas (if 100% coverage is required in the closed areas). This will apply to all permit categories approved for observer coverage allocations in Amendment 5. MOTION FAILED 3 ,6, 0

NEW ENGLAND FISHERY MANAGEMENT COUNCIL
MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

FINAL REPORT

NEFMC Herring Plan Development Team (PDT)
MAFMC Mackerel Fishery Management Action Team (FMAT)

May 22, 2012

Radisson Airport Hotel, Warwick RI

The New England Council's Herring Plan Development Team (PDT) met jointly with the Mid-Atlantic Council's Mackerel Fishery Management Action Team (FMAT) on May 22, 2012 in Warwick, RI to:

- Review the Draft Environmental Impact Statements (DEISs) for Amendment 5 to the NEFMC Herring Fishery Management Plan (FMP) and Amendment 14 to the MAFMC Mackerel FMP and provide technical recommendations for both Councils to consider during the selection of final management measures for these amendments (June Council meetings)
- Discuss/develop recommendations for industry-funded monitoring programs in Amendments 5 and 14
- Discuss issues associated with river herring bycatch and develop recommendations related to Amendments 5 and 14
- Discuss the overlap between the herring and mackerel fisheries and develop related recommendations for both Councils to consider during the selection of final management measures for Amendments 5 and 14

Meeting Attendance: Lori Steele, Herring PDT Chairman; Jason Didden, Mackerel FMAT Chairman; Rachel Neild, NEFMC Staff: Matt Cieri, Jon Deroba, Tim Cardiasmenos, Sara Weeks, Micah Dean, Jamie Cournane, Min-Yang Lee, Madeleine Hall-Arber, Carrie Nordeen, Lindsey Feldman, Aja Szumylo, Jamie Cournane; Chris Vonderweidt (ASMFC), Steve Correia (via Webinar) (Herring PDT Members); Kate Taylor (ASMFC), Lisa Hendrickson, Drew Kitts, (additional Mackerel FMAT Members); Rob Vincent (NMFS NERO), Dave Ellenton (Cape Seafoods), Jeff Kaelin (Lund's Fisheries), Pamela Lyons Gromen, Jud Crawford (Pew), and several other interested parties.

The meeting audio and presentations, where applicable, are available at: http://www.mafmc.org/fmp/msb_files/msbAm14current.htm.

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After a brief round of introductions, Ms. Steele provided an update to the Herring PDT regarding the status of the Draft Amendment 5 document, the DEIS, public hearing process, and the timeline for final decision-making by the Council (June 19-21, 2012 NEFMC Meeting). Mr. Didden provided a similar update for Amendment 14 to the Mid-Atlantic Council's Mackerel FMP, also scheduled for final-decision making at the June 12-14, 2012 MAFMC Meeting.

1.0 FMP ADJUSTMENTS

The PDT and FMAT discussed several components of Amendments 5 and 14, using the table provided in both DEIS documents, which identifies overlapping measures and outstanding consistency issues (see table in Amendment 5, *Overlap Between Amendment 14 to the Squid/Mackerel/Butterfish FMP (MAFMC) and Amendment 5 to the Herring FMP (NEFMC)*).

1.1 VESSEL REPORTING MEASURES

The overlapping vessel reporting measures include VTR/VMS reporting requirements and trip notification requirements. Many of the existing requirements for the herring fishery were implemented by NMFS through rulemaking in 2011, and the NERO supports implementation of consistent measures in the mackerel amendment. Several consistency issues were identified by the PDT and FMAT for consideration during final decision-making:

- Lead times for pre-trip notifications should be consistent across both the herring and mackerel fisheries. A 72-hour lead time was originally proposed for fleets that had previously very little observer coverage, so additional time was provided to address the geographical range of the fishery and uncertainty about the number of trips and the number of available observers (from service providers). As the programs have grown, more observers are available in more ports for more timely departures. Therefore, the PDT/FMAT recommends that the Councils consider adopting a 48-hour lead time for pre-trip notifications in both amendments.
- If the Councils adopt pre-trip notification requirements (for observer deployment), the language in the final amendment referring to a "pre-trip notification system" should be interpreted generally and not necessarily to mean the existing pre-trip notification system (PTNS) for the groundfish fishery. It may ultimately be more efficient to develop a new (more flexible/adaptable) pre-trip notification system.
- A pre-trip notification system can be costly (time, manpower, resources) and should only apply to the vessels targeted for observer coverage. The current pre-trip notification system includes two full-time staff members with others who fill in during evenings, weekends, and holidays. The system has to be available 24 hours a day, seven days a week. Currently, over 1,000 vessels call-in over 20,000 pre-trip notifications every year. While the notification system is helpful to the observer program in deploying observers more efficiently and reducing costs associated with dock tours and sending selection letters, it becomes inefficient and more costly (for the industry and government) if vessels that are not subject to observer coverage requirements are utilizing the system. The language in Amendment 5 should acknowledge that the notification system should link directly to the observer coverage requirements in the fishery as well as provide some flexibility to allow NMFS to notify vessels (perhaps annually) when there is a need to participate in the pre-trip notification program.

- Current pre-trip notification requirements for the herring fishery (72 hours) apply to Category A/B/C/D vessels fishing with midwater trawl gear in Areas 1A, 1B, and 3. These requirements were implemented as part of the haddock catch cap provisions in Framework 43/46 to the Groundfish FMP and may require modification for consistency purposes, depending on which notification requirements are adopted in Amendment 5 and to which vessels they apply.
- One outstanding issue that the PDT/FMAT identified relates to notification and reporting requirements for mixed herring/mackerel trips. Currently, there are VMS declarations for the herring fishery and Amendment 14 considers them for the mackerel fishery, but not for mixed trips. There is no pre-trip gear declaration proposed in the mackerel amendment, but there is one proposed in the herring amendment. The mackerel amendment is proposing daily VMS reporting, which is already required in the herring fishery. Implementing the same requirements for both fisheries may improve consistency. The Herring PDT/FMAT suggests that further consideration of a pre-trip "pelagic" or "herring/mackerel" mixed trip VMS declaration may be useful to streamline requirements for the industry, improve compliance, and enhance enforcement of regulations in both fisheries.

1.2 DEALER REPORTING MEASURES

The Dealer Reporting Measures in Amendment 5 and Amendment 14 include a requirement for dealers to accurately weigh all fish and several sub-options to clarify that requirement and possibly provide an additional cross check between VTR and dealer data. NERO staff expressed support for Option 2C, which would utilize the Fish Online system to allow vessel operators to verify their sales with the corresponding dealer reports. ACL/sub-ACL monitoring in the herring fishery relies on multiple data streams, and providing a cross-check between the dealers and the vessels at the first point of sale could reduce mis-matches between VTR and dealer data. This, in turn, could enhance real-time quota management as well as the end-of-the-year data reconciliation process. NERO staff noted that the Agency's long-term goal is to make Fish Online more user-friendly and helpful for the industry to access catch data.

1.3 OTHER PROPOSED FMP ADJUSTMENTS

Before moving on, Ms. Steele asked the Herring PDT members for additional comments/discussion on the elements of the Amendment 5 catch monitoring program that do not overlap with the mackerel amendment. The PDT and FMAT briefly discussed measures to address transfers of herring at sea and agreed that issues related to reporting/monitoring of herring transferred at sea have largely been clarified between NMFS and the industry in recent years and that the amount of herring affected by this activity is minimal. The Herring PDT also agreed to update the permit numbers for the limited access mackerel program, for the Council to consider when selecting measures to (possibly) allow some limited access mackerel vessels with open access herring permits to fish under a possession limit higher than the current 3 mt.

Table 1 describes the anticipated mackerel limited access vessels and the Atlantic herring permits which are held (based on 2011 data – note that the application period for a limited access mackerel permit does not end until February 2013). The shaded cells represent the number of projected limited access mackerel vessels (by tier) that possess either a Category D (open access) herring permit or no herring permit. Currently, there are a total of 64 vessels with Herring Category D (open access) permits which are projected to qualify for a Limited Access mackerel permit; most of these vessels would qualify for a Tier 3 Mackerel permit. While many vessels may qualify, these vessels account for only a small amount of herring catch.

In recent years, about 95% of all Atlantic mackerel landed has been landed by vessels that are expected to qualify for a Tier 1 mackerel limited access permit. Based on the updated analysis of limited access qualifier, there are expected to be one Tier 1 mackerel vessel with a Category D herring permit (no expected Tier 1 mackerel vessels are without a herring permit of some kind) and 12 Tier 2 mackerel vessels with a Category D herring permit (no expected Tier 2 mackerel vessels are without a herring permit of some kind).

Table 1 Herring Permits Held by Anticipated Vessels Qualifying for Mackerel Limited Access Permits

		Herring Permit Category				
		A	**B**	**C**	**D**	**None**
Mackerel Tier	**1**	18	0	4	1	0
	2	0	1	4	12	0
	3	2	1	7	51	2
	4	14	2	26	1,392	319
	None	2	0	4	316	

Note: Data are preliminary; implementation of the mackerel limited access program is pending.

2.0 MEASURES TO MAXIMIZE SAMPLING AND ADDRESS NET SLIPPAGE

The Herring PDT/Mackerel FMAT discussed the measures under consideration in both amendments to maximize sampling at-sea and address net slippage.

- Under each of the measures selected to improve/maximize sampling at-sea (Section 3.2.2), language should be added/modified to clarify requirements for each gear type subject to the provisions (midwater trawl, purse seine, bottom trawl).
- The Herring PDT/Mackerel FMAT does not support the options under consideration in Amendment 5 to address net slippage that include a *catch deduction* for reasons previously discussed (may increase inconsistencies between data sets and complicate catch monitoring, not consistent with the goals and objectives of Amendment 5; potential consequence of closing a management area/triggering accountability measures and affecting vessels that may not have slipped catch; see February 24, 2011 Herring PDT Report for additional discussion).
- Overall, the PDT/FMAT noted that the options under consideration to address net slippage are somewhat ad hoc and reflect a general lack of understanding about the extent of problems related to net slippage. The PDT/FMAT support improved data collection and efforts to minimize unsampled/unobserved catch; many of the measures to address net slippage may not improve catch monitoring by minimizing unsampled catch or increasing the observers' ability to estimate the content and species composition of a bag, depending on how participants respond to the various measures. The PDT/FMAT reiterated its concerns about safety-at-sea and suggested that the Council consider issues related to National Standard 10 (Safety) when selecting final measures and providing its rationale. Moreover, there may be other reasons that the Council supports a trip termination measure to address net slippage; the Council should identify these reasons when selecting final management measures. The PDT/FMAT reiterated the importance of ensuring that observers are not placed in situations where they are perceived to be serving as enforcement agents.
- Requiring a Released Catch Affidavit may provide some additional information to evaluate the frequency and nature of slippage events in the fishery. The Council may want to consider implementing this requirement on all trips, not just trips with an observer on board. While it is not clear how effective enforcement of this requirement could be, it still could provide a low gain (in terms of additional information) for a relatively low burden. Although this information is already required to be reported on VTRs, an affidavit would create a separate, perhaps more detailed source of information to evaluate slippage.

2.1 CLOSED AREA I INFORMATION

- Only one slippage event has been observed in Closed Area I since the implementation of the rules in November 2009. The PDT/FMAT recognized that interpretation of this information needs further consideration, for example to understand the nature of slippage outside of Closed Area I and whether "Closed Area I Rules" have been successful in reducing slippage events. To do so, the PDT/FMAT briefly reviewed preliminary observer data summarizing "catch not brought on board" in the herring fishery during 2011 (see below).
- NEFOP staff on the Herring PDT investigated recent observer data more closely to evaluate the occurrence of slippage events outside of Closed Area I.

  According to the Amendment 5 DEIS, there were 99 hauls observed in Closed Area I during 2010, under the new provisions for sampling catch, implemented in November 2009. There were no slippage events observed in these 99 hauls, and consequently no Released Catch Affidavits were submitted from the Closed Area I fishery in 2010. There appears to have been one released catch event (estimated 1,500 pounds) on a haul that ended (but did not begin) in Closed Area I.

  In 2011, there were 28 hauls observed in the Closed Area I from vessels on declared Atlantic herring trips. These hauls represent less than three (3) vessels fishing, and therefore, the specific details cannot be released due to confidentiality restrictions. There were no partial or full slippage events documented in Closed Area I during 2011. There were 313 observed trips in all Atlantic Herring Management areas (trips defined by gear type and include purse seine and paired/single midwater trawl) in 2011, resulting in a total of 723 associated observed hauls.

2.2 PRELIMINARY 2011 OBSERVER DATA (INCLUDING CATCH NOT BROUGHT ON BOARD)

The following information was provided by NEFOP staff on the Herring PDT and updates some information provided in the Amendment 5 Draft EIS.

Table 2 summarizes coverage rates from the NEFOP for the 2007-2011 calendar years (also the herring fishing years) by gear type for all trips that landed greater than 2,000 pounds of Atlantic herring and updates Table 142 in the Amendment 5 DEIS. Forty six percent (46%) of total herring landings were observed during 2010. During the 2011 fishing year, the Northeast Fisheries Observer Program covered trips for about 55% of all midwater trawl Atlantic herring landings, 45% of pair trawl landings, 25% of purse seine landings, and 13% of bottom trawl herring landings.

Observer coverage of mackerel catch has generally been less in recent years, partially because the observer program used to select away from trips that target mackerel but still notified for herring (this was due to coverage needs for herring related to groundfish).

Table 2 Observer Program Coverage Rates for Trips Landing Greater than 2,000 pounds of Herring, 2007-2011

Year	Gear Type	Total Trips	Total Days	Total Herring Landed (lbs.)	Obs Trips	Obs Days	Obs Herring Kept (lbs.)	% trips obs	% days obs	% herring obs
2007	OTF	397	569	10,518,575	12	15	411,751	3%	3%	4%
2007	OTM	138	451	17,491,210	10	40	1,918,285	7%	9%	11%
2007	PTM	240	849	74,405,385	14	58	6,880,147	6%	7%	9%
2007	PUR	346	743	70,088,194	10	23	2,122,267	3%	3%	3%
2008	OTF	100	234	4,588,190	4	4	70,409	4%	2%	2%
2008	OTM	28	107	8,816,600	16	59	3,163,763	57%	55%	36%
2008	PTM	269	1044	110,453,766	46	176	27,211,668	17%	17%	25%
2008	PUR	232	550	59,211,542	27	64	6,941,134	12%	12%	12%
2009	OTF	180	306	9,647,215	11	15	554,579	6%	5%	6%
2009	OTM	50	242	13,875,075	16	69	3,747,316	32%	29%	27%
2009	PTM	356	1321	153,345,903	98	350	49,596,367	28%	26%	32%
2009	PUR	223	596	49,706,514	42	130	9,943,521	19%	22%	20%
2010	OTF	185	343	8,452,546	9	22	298,691	5%	6%	4%
2010	OTM	58	230	19,851,018	32	122	10,190,452	55%	53%	51%
2010	PTM	290	1129	98,165,321	128	545	47,528,352	44%	48%	48%
2011	OTF	175	368	9,449,163	24	59	1,208,293	14%	16%	13%
2011	OTM	61	165	17,647,500	27	91	9,758,411	44%	55%	55%
2011	PTM	295	1071	115,321,409	123	452	51,562,629	42%	42%	45%
2011	PUR	271	603	37,908,770	79	172	9,506,794	29%	29%	25%

OTF – small mesh bottom trawl; OTM – single midwater trawl; PTM – paired midwater trawl; PUR – purse seine
Herring is Atl Herring or Unk Herring
Day defined as (date land - date sail) + 1
Landings data from Vessel Trip Reports

Table 3, Figure 1, and Figure 2 on the following pages summarize data for the observer records (1140 unique hauls) in 2011 on limited access declared herring trips that included fish not brought on board. About 198 of these hauls were documented with "not enough fish to pump," i.e., operational discards. Observers document operational discards as *Herring NK* if they are able to see the fish that are not pumped and confirm that the discards are all herring-bodied fish. Otherwise, the discards are documented as *Fish NK*. Data were pulled similar to the 2010 released catch/slippage data provided in the Draft Amendment 5 EIS (see Section 5.3.2.1, p. 413 of Amendment 5 DEIS for comparable 2010 data).

The total weight of fish not brought on board estimated by observers in 2011 was 1,041,211 pounds; this includes operational discards, which, although more frequent, generally represent very small amounts of fish.

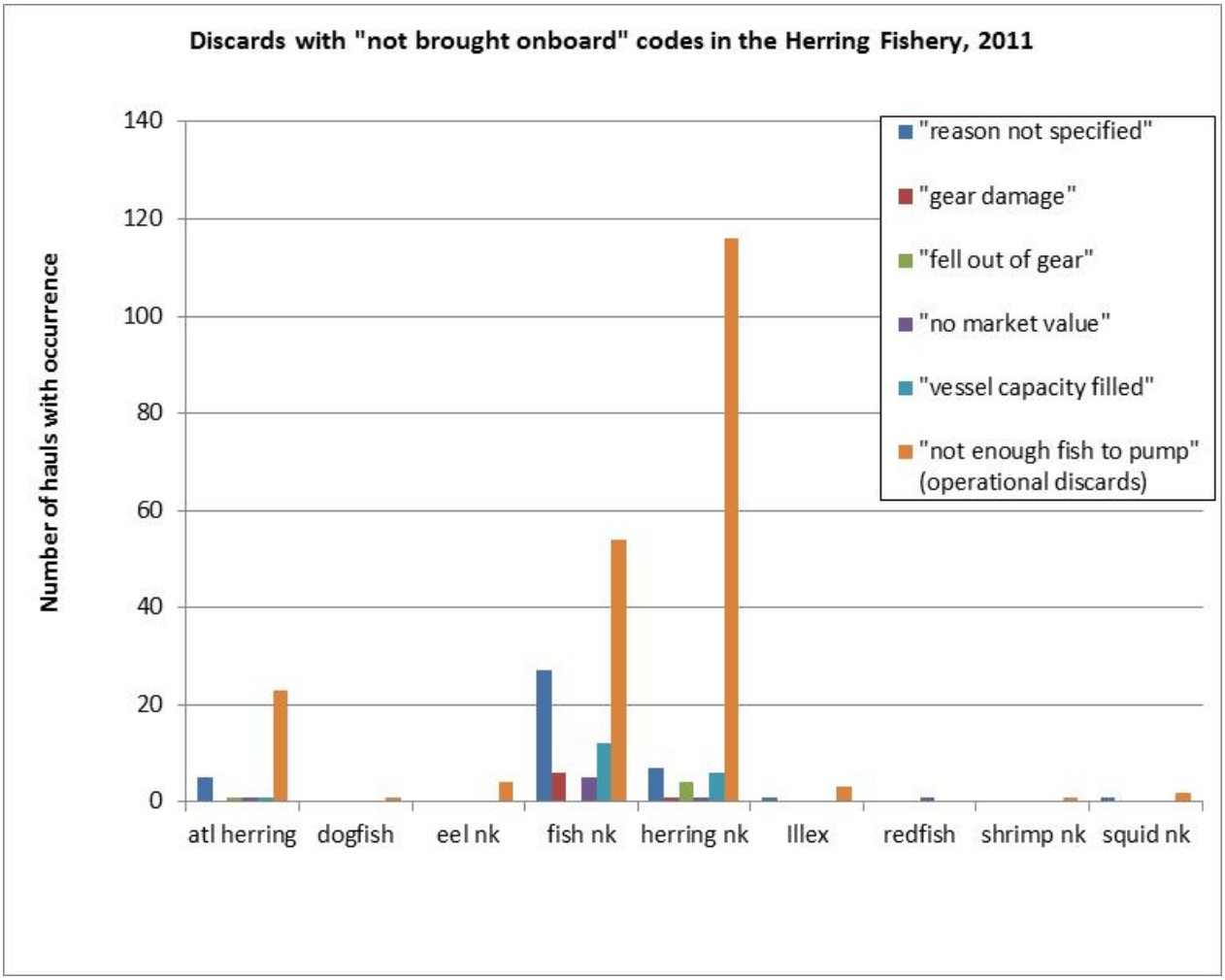
A review of the observer data indicate that in 2011, **78 out of 1,140 hauls** were observed on limited access declared herring trips to have experienced full or partial slippage events (catch not brought on board, not including operational discards). The ratio of total estimated catch not brought on board compared to the total observed catch on these vessels in 2011 was about 1.4% (this does not include fish that were brought on board and then discarded). By gear type, this ratio translates to 0.16% for bottom otter trawl (all areas), 5.31% for purse seine (Area 1A), 2.19% single midwater trawl (all areas), 0.11% pair trawl (Area 1A), 0.53% pair trawl (Area 3), and 0.48% pair trawl (Area 2).

Table 3 Summary of 2011 Observed Events on Limited Access Herring Vessels – Declared Herring Trips (by Number and Estimated Weight of Fish in lbs.) with *"Fish Not Brought on Board"* Codes

	species	"reason not specified"	"gear damage"	"fell out of gear"	"no market value"	"vessel capacity filled"	"not enough fish to pump" (operational discards)
Number of hauls with occurrence	atl herring	5	0	1	1	1	23
	dogfish	0	0	0	0	0	1
	eel nk	0	0	0	0	0	4
	fish nk	27	6	0	5	12	54
	herring nk	7	1	4	1	6	116
	Illex	1	0	0	0	0	3
	redfish	0	0	0	1	0	0
	shrimp nk	0	0	0	0	0	1
	squid nk	1	0	0	0	0	2
Estimated weight (lbs)	atl herring	2,754	0	10	10,000	500	1,947
	dogfish	0	0	0	0	0	80
	eel nk	0	0	0	0	0	860
	fish nk	339,170	394,000	0	68,400	108,500	11,398
	herring nk	43,700	300	170	10,000	32,700	16,248
	Illex	3	0	0	0	0	30
	redfish	0	0	0	400	0	0
	shrimp nk	0	0	0	0	0	1
	squid nk	10	0	0	0	0	30

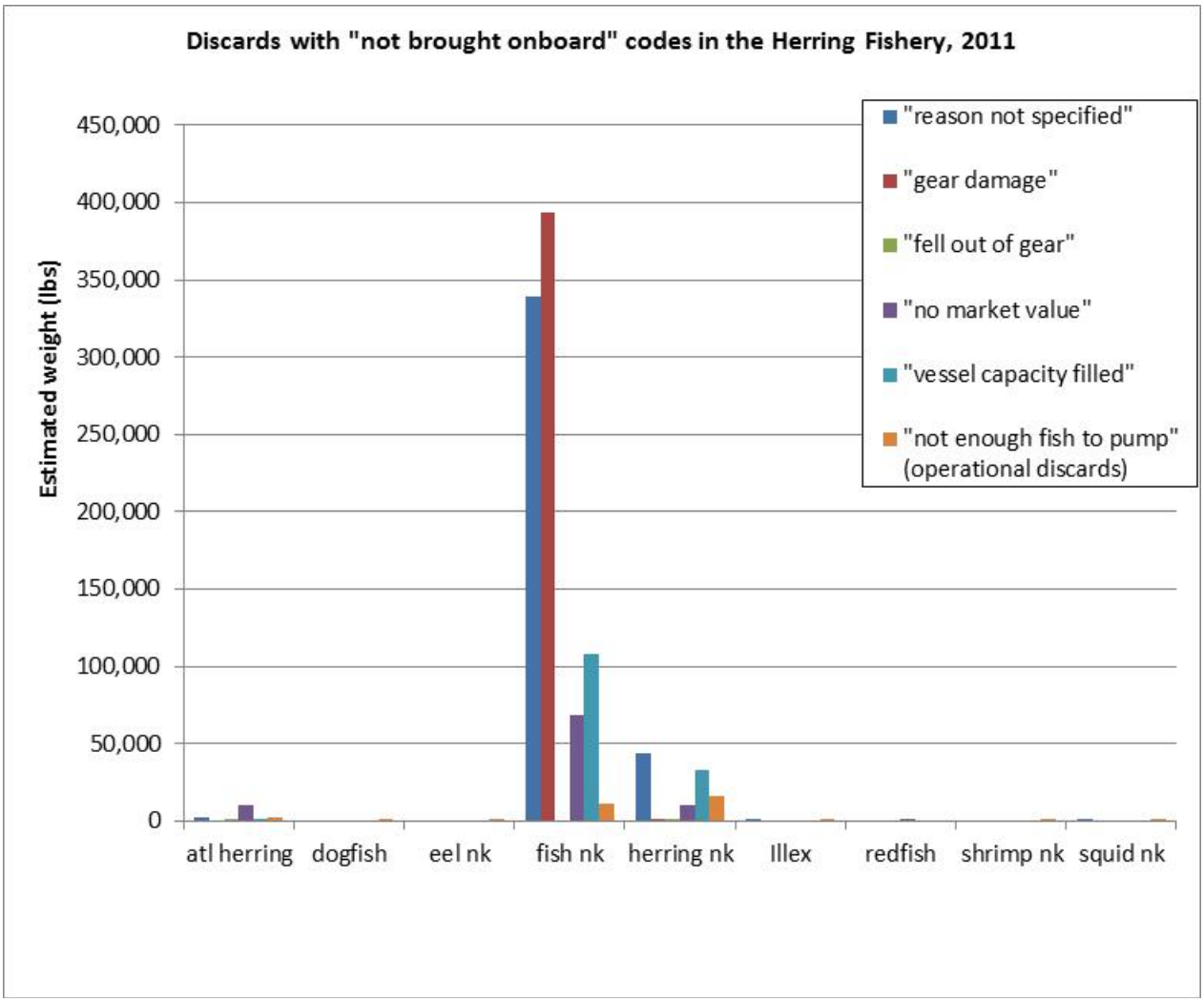
Note: Information in all columns except for the far right ("not enough fish to pump" (operational discards)) represents partial/full slippage events.

Figure 1 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (by Species and Number of Hauls)



Note: All columns except for "'not enough fish to pump' (operational discards)" represent partial/full slippage events.

Figure 2 Observed Events on Limited Access Herring Vessels – Declared Herring Trips in 2011 with "*Fish Not Brought on Board*" Codes (By Species and Estimated Weight of Fish in Pounds)



Note: All columns except for "'not enough fish to pump' (operational discards)" represent partial/full slippage events.

There was almost no mackerel fishery in 2011, but in 2010 there were eight (8) observed mackerel trips (50% mackerel or over 100,000 pounds mackerel) that caught about 5.5 million pounds of fish (about 2 million pounds of mackerel and 3.3 million pound of herring) and had about 12,000 pounds of unobserved fish ("not brought on board"), some of which was specified by species but mostly consisted of "*Fish, NK*."

3.0 ALTERNATIVES TO ALLOCATE OBSERVER COVERAGE AND OPTIONS FOR INDUSTRY-FUNDED CATCH MONITORING

Amy Van Atten from the Northeast Fisheries Observer Program (NEFOP) presented an overview of updated information about the NEFOP Fisheries Sampling Program and costs associated with both observer coverage and at-sea monitoring programs (which utilize service providers). The PDT and FMAT discussed cost issues associated with observers and at-sea monitors. Ms. Van Atten noted that the Atlantic herring fishery is the most complicated fishery in the Northeast Region to sample.

Observer costs throughout the Northeast region are higher than costs in other parts of the country for many reasons, including more complicated trip logistics, high levels of training required, and a high rate of trip cancellation. Observers on the west coast, for example, are often deployed for 30 days at a time, resulting in reduced travel expenses and less down time. Northeast region fisheries include many single and small boat day trips, which are spread across multiple states and remote ports. Frequent trip cancellations (due to poor weather or fishing conditions) also increase costs. Depending on how the program is structured, the per-day costs of an industry-funded catch monitoring program are not likely to be significantly less than the per-day costs of the NEFOP program.

It is possible that program costs can be lowered with adequate planning and design time. However, a successful industry-funded monitoring program will probably take a significant amount of time to develop and incorporate into the current management system. Careful attention must be paid to designing the program properly to ensure data quality, reduce trouble-shooting with industry and service providers, increase efficiency, and reduce costs. While this should not delay the selection of final management measures and the completion of Amendments 5 and 14, it should be recognized by all parties that this element of the amendments may require more time for implementation than others. Ms. Van Atten's presentation explores several ways to reduce costs and compares costs between utilizing NEFOP observers and at-sea monitors; this information will be presented to the Herring Committee at its June 6 meeting.

Mr. Didden also presented a preliminary vessel by vessel analysis that appears to show that while over 2008-2010 vessels that have over 500 pounds of river herring observed caught in one year may have over 500 pounds caught in another, the vessels varied considerably from year to year in terms of both the absolute quantity of river herring caught and in terms of the ratio of river herring caught to retained catch. This analysis was in response to a comment submitted on April 3 by Jim Ruhle. Due to the limited time available for new analysis the findings would have to be categorized as very preliminary. In addition, targeting of individual "problem" vessels might be out of the scope of alternatives considered in Amendments 5 and 14. Additional work on this issue may suggest measures that could be appropriate for future consideration.

3.1 MONITORING PROGRAM – GOALS AND OBJECTIVES

The New England Council identified the following goals (numbered) and objectives (bulleted) of the catch monitoring program established in Amendment 5 to the Herring FMP:

1. **To create a cost effective and administratively feasible program for provision of accurate and timely records of catch of all species caught in the herring fishery;**
    - Review federal notification and reporting requirements for the herring fishery to clarify, streamline, and simplify protocols;
2. **Develop a program providing catch of herring and bycatch species that will foster support by the herring industry and others concerned about accurate accounts of catch and bycatch, i.e., a well-designed, credible program;**
    - Avoid prohibitive and unrealistic demands and requirements for those involved in the fishery, i.e., processors and fishermen using single and paired midwater trawls, bottom trawls, purse seines, weirs, stop seines, and any other gear capable of directing on herring;
    - Improve communication and collaboration with sea herring vessels and processors to promote constructive dialogue, trust, better understanding of bycatch issues, and ways to reduce discards;
    - Eliminate reliance on self-reported catch estimates;
3. **Design a robust program for adaptive management decisions;**
4. **Determine if at-sea sampling provides bycatch estimates similar to dockside monitoring estimates;**
    - Assure at-sea sampling of at-sea processors' catches is at least equal to shoreside sampling;
    - Reconcile differences in federal and states' protocols for dockside sampling, and implement consistent dockside protocols to increase sample size and enhance trip sampling resolution.

The Mid-Atlantic Council's goals in terms of monitoring are:

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

In 2008, two researchers from the Archipelago organization in British Columbia authored a paper evaluating monitoring and reporting needs for sectors in New England (McElderry and Turris 2008). In the paper, they urged that, "the design of an effective and comprehensive monitoring program is guided by having a clear understanding of the objectives for the program." Objectives were broken into categories based on whether they were objectives of managers or industry participants, and some were considered to be shared while others were distinct between the two groups. The objectives for managers included TAC management, quantifying total mortality, species and area management, timely information, improved stock assessment, and improved compliance. Industry's monitoring objectives were listed as timely and accurate data, a level playing field, affordability, and economic benefits.

Once program goals and minimum data needs are determined, calculations can be done to determine the most cost-effective way to achieve the desired outcomes.

3.2 NEFOP SEA SAMPLING VS. AT-SEA MONITORING

The goals and objectives for the New England catch monitoring program (above) are relatively broad in scope. Identifying a narrower set of goals and objectives for an industry-funded monitoring program and reducing sampling requirements could reduce costs and enhance the program's effectiveness in the earlier years. Data generated by a more simplified at-sea monitoring (ASM) program may not be comparable/additive to NEFOP observer data, but may still provide some critical information to enhance catch monitoring and address the goals and objectives identified by the Councils. Moreover, while NEFOP and ASM data may not be additive, they could still be utilized for the same purposes because they should meet the same data quality standards (i.e. quota monitoring, estimating bycatch, stock assessment, depending on the goals and objectives). Developing a more simplified ASM program funded by the industry could be an intermediate step towards a more comprehensive long-term program that can evolve adapt to meet the monitoring and data collection needs of management, science, and the industry.

After the implementation of Amendment 5 (and Amendment 14), Federally-funded observer coverage would continue through the NEFOP at a baseline level (currently defined by the SBRM process), so an industry-funded program could be developed separately and focused, at least at first, on a more narrow set of sampling objectives. Biological sampling could be eliminated for ASMs, reducing training and gear costs. ASMs could be tasked with documenting and providing detailed information on slippage events in the fishery (as one objective, for example). However, the PDT and FMAT recognize that "data creep" (data collection needs, which continue to increase) and multiple priorities will likely make it more challenging shave costs in this area.

Table 4 provides perspective on some example goals for a monitoring program; these examples have been gleaned from a literature review (background work for the groundfish program) and include some goals that were identified through the NEFMC sector workshop (2011). Some additional examples that relate directly to the herring fishery have been provided for consideration relative to an at-sea monitoring (ASM) program versus the NEFOP observer program. All of the example goals provided in the table below are currently being addressed by the NEFOP sea sampling program.

Table 4 Example Goals for Monitoring Programs

Category	Goal
Science	Determine total catch and effort of target or regulated species
Science	Determine total catch and effort of non-target or non-regulated species
Science	Biological sampling
Science	Environmental parameters
Science	Protected species monitoring/sampling
Science	Determine discard rate
Science	Quantify total mortality including discards
Science	Determine catch by area
Science	Obtain accurate catch and effort information
Compliance	Area and gear restrictions
Compliance	Illegal discarding
Compliance	Prohibited species
Compliance	Monitor overall ACL
Other	Reduce management and/or biological uncertainty
Herring	Document slippage
Herring	Document at-sea discards
Herring	XXX

Table 5 generally describes the differences between Northeast Fisheries At-Sea Monitoring Program Monitors (ASM) and Northeast Fisheries Observer Program (NEFOP) Observers (or NMFS-approved observers). Both programs are developed and overseen by NMFS Fisheries Sampling Branch at the Northeast Fisheries Science Center (NEFSC). The main difference between the two is that monitors collect a reduced set of data, thereby reducing training time, gear requirements, and internal support resources. NEFOP observers and ASM monitors are trained by the NEFSC. Data collected by both programs are processed by the NEFSC. Observers and monitors identify and record all species caught, are trained in sub-sampling methodology, and receive advanced training in vessel safety.

Table 5 Differences Between NMFS-Approved Observers and At-Sea Monitors

TASKS/ REQUIREMENTS	ASM MONITOR	NEFOP OBSERVER/NMFS-APPROVED OBSERVER
BACHELOR'S DEGREE	NO (High School diploma or equivalency)	YES
NMFS TRAINING DURATION	11 days	15 days
DATA COLLECTION	Basic	Advanced Ex: sighting logs
BIOLOGICAL SAMPLING	None	Mammals, turtles, birds, fish, and crustaceans
AMOUNT OF GEAR ISSUED	44 items	83 items
GEAR CHARACTERISTICS INFORMATION	Basic	Advanced Ex: record intricate gear configurations
PERFORMANCE-BASED BONUS PROGRAM	No	Yes (Discontinued)
SUPPLEMENTAL RESEARCH PROJECTS	No	Yes
RECORDING DATA	Paper + Electronic (Paper worksheets, iPaq)	Paper + Electronic (Paper Logs, iPaq, Rugged laptops)
TRAINING TRIP REQUIREMENTS	Not required, however added to training and shadow trip program	Yes, 4 are required
TRAINING PROVIDER	NEFSC	NEFSC
DATA PROCESSING	NEFSC Data availability = ~7 days	NEFSC Data availability = ~90 days

The costs of the monitoring program may be reduced through ASMs in several ways: (1) ASMs can be contracted for shorter time frames (2 years versus 5 years); (2) the duties of ASMs can be more narrowly defined geographically, temporally, or through selection of vessels/gear types; (3) the multi-vendor contract model may encourage competition and result in reduced program costs; (4) ASMs do not have defined meal reimbursement policies or monetary data quality bonus incentives; and (5) training and gear requirements/costs may be reduced by removing biological sampling requirements and/or other sampling depending on the goals/objectives.

3.3 MONITORING PROGRAM – POTENTIAL COSTS

The costs of an industry-funded monitoring program will depend on the details – scale, number of vessels, goals and objectives. Analysis in the Draft Amendment 5 EIS evaluates the costs of observer coverage and impacts of industry-funded at-sea monitoring based on an assumed rate of $1,200 per sea day. This could be considered an upper bound on costs and is based on the objective of sampling the fishery to generate data that mirror the NEFOP observer data (i.e., to generate accurate accounts of catch and bycatch in the fishery).

The Herring PDT and Mackerel FMAT agree that the dockside monitoring program proposed in Amendment 14 to the Mackerel FMP is likely to provide a significant cost savings for collecting catch information for the mackerel fishery. The PDT/FMAT support future reconsideration of a dockside monitoring program for the herring fishery.

Currently, NMFS does not have legislative authority to collect funds to support government-contracted observer coverage, with very limited exceptions (North Pacific). A mix of government and industry funding is utilized by some programs in the U.S., including the North Pacific Groundfish Observer Program (NPGOP), Northeast Fisheries Observer Program (NEFOP), and At-Sea Hake Observer Program (A-SHOP).

North Pacific Groundfish Observer Program (NPGOP)

- Largest industry-funded program, est. 1989
- Groundfish vessels 60-125 feet (30%), groundfish vessels greater than 125 feet (100%), shoreside processors 500-1000 mt groundfish per month (30%), shoreside processors more than 1000 mt groundfish per month (100%)
- NMFS – operational oversight, certification training, identification of observer duties and sampling methods, observer debriefing, data management, observer program management
- Industry (vessel owners, processing plant owners) – observer costs (wages)
- In 2009, the industry provided approx. $13M to support observer deployment and data collection, and NMFS provided about $4.7M to support the program.

At-Sea Hake Observer Program (A-SHOP)

- Est. 2004
- 100% coverage catcher-processors and motherships (2 observers on vessels 125 feet or greater)
- NMFS – operational oversight, certification training, identification of observer duties and sampling methods, observer debriefing, data management, observer program management

Atlantic Sea Scallop Observer Program

- Est. 2006 through Emergency Rule and permanently implemented in A13 to monitor bycatch of yellowtail flounder in Scallop Access Areas, and interactions with sea turtles
- 10% of all scallop trips in Access Areas and limited access trips in open areas
- Current service providers – AIS (70 observers), EWTS (26 observers), Fathoms Research (8 observers)

Northeast Multispecies (Groundfish) Monitoring Program (Work in Progress)

- Regulations pertaining to an industry-funded monitoring program for the multispecies (groundfish) fishery were implemented in Amendment 16 to the Northeast Multispecies (Groundfish) FMP.
- NEFOP funds increased in FY2010 for groundfish sector monitoring; funding limited for future years, and shifting towards industry-funded program
- Current service providers (paid directly by NEFOP through contracts) – AIS (43 observers), EWTS (26 observers), and MRAG (28 observers)

Based on Groundfish Fishing Year 2010, the overall cost at-sea monitoring sea day cost is $917.95 (see Table 6). The costs for an at-sea monitor can be separated into two components: at-sea and infrastructure. At-sea monitors are paid a sea day rate and an hourly rate when they're on land or extended travel. They use an average of 12 hours per day for at sea time. The average at-sea monitor sea day wages, insurance, and benefits comprise the highest percentage of costs at 68.68% ($630.44). Travel and training are smaller components at 3.52% ($32.28) and 4.08% (37.46) respectively. Infrastructure and support costs account for the remainder. These include coordination of trip logistics, gear and equipment, communication and shipping, business fees and taxes. Sector contract labor including training and data processing costs $114.17 (12.44%). Support contracts for expert trainers, vessel training trips, freezers and facilities cost $37.88 (4.13%). Gear costs another $8.85 (0.96%). FSB FTE labor costs $50.86 (5.54%) and travel is $6.00 (0.65%).

Table 6 NEFOP and ASM Cost Comparison for Groundfish Fishing Year 2010

CALCULATION OF SEADAY COSTS FOR ASM AND NEFOP (Based on Groundfish Fishing Year 2010)

ASM COSTS	ESTIMATED TOTAL COST PER SEADAY	AT-SEA PORTION OF SEADAY COST	Percentages
ASM Seaday (avg)	$630.44		68.68%
ASM Travel (avg)	$32.28		3.52%
ASM Training (avg)	$37.46	$700.19	4.08%
Sector Contract Labor (Training and Data Processing)	$114.17	INFRASTRUCTURE PORTION OF ASM SEADAY COST	12.44%
Support Contracts (Expert Trainers, Vessel Training Trips, Freezers, Facility)	$37.88		4.13%
ASM Gear	$8.85		0.96%
FSB FTE Labor	$50.85		5.54%
FSB FTE Travel	$6.00		0.65%
Center Overhead	$0.00	$217.76	0.00%
*SUPER LOADED ASM SEADAY		$917.95	

NEFOP COSTS	ESTIMATED TOTAL COST PER SEADAY	AT-SEA PORTION OF NEFOP SEADAY COST	Percentages
NEFOP Seaday	$741.88		49.88%
NEFOP Travel	$59.38		3.99%
NEFOP Training	$39.70		2.67%
NEFOP Meals	$12.55		0.84%
NEFOP Data Quality Rewards	$41.22		2.77%
NEFOP Land Hours	$1.41	$896.14	0.09%
NEFOP Contract Labor	$165.98	INFRASTRUCTURE PORTION OF NEFOP SEADAY COST	11.16%
Support Contracts	$37.88		2.55%
NEFOP Gear	$13.65		0.92%
FSB FTE Labor	$170.06		11.43%
FSB FTE Travel	$6.00		0.40%
Center Overhead	$197.51	$393.57	13.28%
*SUPER LOADED NEFOP SEADAY		$1,487.22	

3.4 ATLANTIC HERRING VESSELS (BACKGROUND INFORMATION)

Table 7 summarizes the number of federally permitted Atlantic herring vessels by Amendment 1 permit category and length. There were 101 vessels with limited access permits during the 2010 fishing year. The majority of participants in the directed Atlantic herring fishery are Category A and B vessels. There was a reduction of three vessels (from 49 to 46) in the limited access directed fishery (Categories A and B) in 2010 from the previous year, possibly due to substantial cuts in herring catch limits in the 2010-2012 specifications (see following subsections for more information). There are 55 limited access incidental catch permit holders in the fishery, and over 2,000 open access permit holders.

Table 7 Number of Vessels by Atlantic Herring Permit Category, 2008-2010

Herring Permit Category		Year		
		2008	2009	2010
	A	45	45	42
	B	5	4	4
	C	58	55	55
	D	2,409	2,394	2,258

Source: NMFS Permit databases, May 2011

As Table 8 demonstrates, in 2010, 30 out of the 46 vessels (65%) that held a Category A or B herring permit (limited access directed fishery) were "active," meaning they landed herring within that year. Twenty seven percent (27%) of Category C vessels (limited access incidental catch) landed herring in 2010, while only 4% of Category D permits landed herring in 2010. However, the number of Category D permits that landed herring increased significantly in 2010 to 94, up from 67/68 in 2009/2008 respectively.

Table 8 "Active" vs. "Latent" Vessels by Category, 2008-2010

	2008			2009			2010		
Category	Total # of Vessels	Active Vessels	Difference	Total # of Vessels	Active Vessels	Difference	Total # of Vessels	Active Vessels	Difference
A/B	50	30	20	49	31	18	46	30	16
C	58	10	48	55	13	42	55	15	40
D	2,409	68	2,341	2,394	67	2,327	2,258	94	2,164

Note: Active is defined in the above table as having landed one pound or more Atlantic herring during that fishing year.

3.5 IMPORTANT CONSIDERATIONS

The Herring PDT and Mackerel FMAT discussed various elements of a draft discussion paper identifying issues associated with developing an industry-funded monitoring program, which would provide information about costs associated with observer coverage and at-sea monitoring and will discuss some possible approaches to developing an industry-funded program for the herring fishery. Following the meeting, it was agreed that the elements of the discussion paper would be incorporated into this report.

The Herring PDT and Mackerel FMAT note the following important considerations:

- Because of the need for an industry-funded catch monitoring program to evolve and change to meet the needs of science, management, and the industry, it will be important to structure an industry-funded program such that it can modified to incorporate various monitoring approaches, possibly including dockside monitoring and electronic monitoring in the future. Evaluation of the existing/evolving monitoring program and continued research into new technologies enhances industry participation in the program and allows for a more bottom-up approach to catch monitoring. The PDT and FMAT also suggest consideration of a "Pelagic Industry-Funded Monitoring Program" to further align long-term management of the herring and mackerel fisheries. This program could incorporate the at-sea monitoring components of both amendments and the shoreside monitoring component of Amendment 14, to improve coordination and allow monitoring to advance in the most cost-effective and efficient manner for both fisheries.
- An industry-funded catch monitoring program, if developed for the herring fishery, should be "**adaptable**," i.e., structured so that additional elements like shoreside and electronic monitoring may be incorporated in the future.
- The **delineation of duties** for each party in a monitoring program needs to be considered carefully in order to ensure accuracy of data, elimination of redundancy, and cost reduction.
- It may be prudent to consider a more **comprehensive approach** to developing industry-funded monitoring programs for all fisheries in the Northeast Region.
- **Communication networks** are important, and notification requirements are essential.
    - For 100% coverage, the sampling frame can be determined through vessel permits. For less than 100% coverage, the PTNS or similar system would be utilized to allow NMFS/NEFOP to select trips to cover and deploy observers
    - Within Agency – permit information and adjustments to coverage levels and vessels subject to monitoring requirements
    - NMFS and Industry – requirements for coverage, notifications, observer health and safety regulations, issuance of waivers
    - NMFS and Service Providers – roles and responsibilities clearly defined, coverage levels and priorities, vessels subject to requirements, how/when information will be transmitted
    - Industry and Service Providers – fees to be charged per trip, what costs are included, billing and payment procedures, how late payments will be handled.

- **Nonpayment issues** may be a concern. Observer service providers may refuse to deploy observers on a particular vessel if that vessel has outstanding balances due. Regulations may be implemented to protect observer service providers from fishermen who refuse to pay their observer service charges.
- A close working relationship between NMFS Office of Law Enforcement (OLE) and the observer program is critical to ensure that vessels comply with observer requirements, and to maximize the **safety** of observers.

Potential Provisions/Requirements

There are several potential provisions/requirements that the Council could consider implementing as part of an industry-funded monitoring program, to try to address some of the challenges (administration, communication, sampling, observer certification, training, conflict of interest, safety, equipment, data quality) that have been experienced with other industry-funded programs.

- Requirement for the observer service provider to report observer deployments daily to NMFS to allow monitoring of pre-determined coverage levels
- Requirement for observer service provider to report to NMFS the failure to respond to an industry request for observer coverage due to lack of available observers
- NMFS could provide an estimated number of observer sea days for the fishing year to all service providers
- NMFS could maintain a list of certified service providers and distribute this list to all vessels participating in the fishery
- Requirement for observer service provider to submit to NMFS, if requested, a copy of each type of signed and valid contract between the provider and the vessel
- Requirement for observer service provider to submit observer deployment and logistics reports to NMFS on a weekly basis
- Requirement for service providers to sign, under penalty of perjury, a conflict of interest statement
- Daily reports by the providers to NMFS – summary trip data must be reported back to NMFS within 24 hours of landing; raw data must be provided to NMFS within a certain period of time after landing; observer must be available to NMFS for debriefing for a certain period of time following any observed trip
- Prohibition on service providers from deploying the same observer consecutively on the same vessel for more than a certain number of days/trips per month
- Requirements to share information with NMFS re. vessels with outstanding payments due

4.0 MANAGEMENT MEASURES TO ADDRESS RIVER HERRING BYCATCH

The Herring PDT and Mackerel FMAT discussed the measures under consideration in both amendments to address river herring bycatch and noted the following:

- Coordination between the herring and mackerel fisheries would be essential under a river herring catch cap, to improve the effectiveness of the cap and potentially reduce impacts on the industry.
- During the development of these amendments, the Mackerel FMAT generally supported a management approach based on river herring catch caps, while the Herring PDT generally supported a spatially-based management approach (the mackerel amendment also considers large-scale area closures). The PDT and FMAT noted, however, that both groups have identified challenges associated with any of the approaches under consideration, and overall, the technical opinions of the two groups are not widely disparate.

At this meeting, the PDT/FMAT jointly discussed the alternatives under consideration. Table 9 summarizes some important factors that both Councils should consider when selecting measures to address river herring/shad (RH/S) bycatch. Several common themes that apply to all alternatives include:

- The statuses of RH/S are "depleted" so mitigation of impacts should be considered.
- The degree of beneficial overall impacts related to RH/S from any measure are uncertain because of the lack of assessment reference points and uncertain contribution from various sources of mortality. Related to a cap, minimal information exists on what would be an appropriate amount for a catch cap.

Table 9 Overview of Measures to Address River Herring/Shad Bycatch in Herring Amendment 5/Mackerel Amendment 14

Measure	Effectiveness in Controlling or Reducing River Herring and/or Shad (RH/S) Catch	Implementation Difficulty	Enforcement Difficulty	Monitoring Needs	Economic Effects
Mortality Caps	While precision is dependent on observer coverage, caps are the only measure that directly control the amount of RH/S catch in a given fishery (though impacts of doing that are uncertain); however, no ability to index a catch cap to the RH/S population size	Requires certain infrastructure and NERO-NEFSC cooperation adjustments but such infrastructure is in place for other fisheries (ex., butterfish, haddock catch cap)	Closures are relatively easy to enforce but assessing compliance with observer call-in requirements is more difficult.	Similar catch and bycatch caps already exist and are monitored on a weekly basis by NERO. Depending on how precise an estimate the Council wants to be using when closing a fishery, may need high level of observer coverage. Programmatic reviews of effectiveness are required for adaptive management.	Difficult to predict but could be significant; If a cap is set high, or low bycatch is observed, then perhaps minimal impacts on fishery. Major impacts are possible if a cap is set low, or high bycatch is observed.
Small Area Management (hotspots)	Reduces catch in the area(s) if in a given year RH/S are present and fishery would have otherwise operated there in such a year. Overall catch impact uncertain since may displace fishing effort and create new bycatch hotspots.	Area-based management is widely used in other fisheries.	Area-based management is relatively easy if all vessels have VMS reporting requirements but harder otherwise. Smaller, shifting areas are harder to enforce.	Easier if all vessels have VMS requirements. All herring vessels have VMS, but not all squid/mackerel/butterfish vessels	Low impacts given the small size of the areas.

Table 9 Overview of Measures to Address River Herring/Shad Bycatch in Herring Amendment 5/Mackerel Amendment 14 (continued)

Measure	Effectiveness in Controlling or Reducing River Herring and/or Shad (RH/S) Catch	Implementation Difficulty	Enforcement Difficulty	Monitoring Needs	Economic Effects
Large Area Management	More likely to reduce RH/S catch than small areas because severe restriction would likely reduce overall effort.	Area-based management is widely used in other fisheries.	Area-based management is relatively easy if all vessels have VMS reporting requirements but harder otherwise.	Easier if all vessels have VMS requirements. All herring vessels have VMS, but not all squid/mackerel/butterfish vessels	Major impacts due to large areas involved.

2nd Program Report

Period covered by Report 6/30/2010 - 5/18/2012

River Herring bycatch Avoidance in Small Mesh Fisheries

Easygrants ID: 21368

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Project Summary

This project is a collaboration between the Sustainable Fisheries Coalition (SFC), the Massachusetts Division of Marine Fisheries (MA DMF) and the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) to develop river herring and American shad (alosine) bycatch avoidance methods. Sustainable Fisheries Coalition members account for the majority of US landings of Atlantic herring and mackerel. River herring species are also encountered in these directed fisheries. Minimizing unintended bycatch has been a goal of SFC members since fisheries managers alerted the industry in 2006 that the river herring species complex was depressed. The specific goals of the project are to develop (1) a real-time bycatch avoidance intra-fleet communication system, (2) a predictive model of where alosines are likely to occur in space and time, and (3) additional support for port sampling to inform the initiative. Work completed to achieve each goal and comparison of to-date results grant evaluation metrics is described in detail in the body of the report. In summary, three river herring bycatch avoidance systems, focusing on the times and locations with the most alosine bycatch, have been conducted. High levels of cooperation by industry members and the appearance of distinct spatial and temporal bycatch patterns within the avoidance areas suggests these systems may have resulted in reduced alosine bycatch. Several ranges of environmental variables with significantly different probabilities of catch for species of interests have been identified within the National Marine Fisheries Service bottom trawl survey database. The MA DMF has sampled 13 of the 14 vessels that have landed in Massachusetts ports, and approximately 161 out of 299 trips (as of 3/15/12). This work is being incorporated into a PhD dissertation titled "Understanding and avoiding River herring and American shad bycatch in the Atlantic herring and mackerel mid-water trawl fisheries". The student has completed all course requirements, passed his comprehensive exams, and is preparing to defend his proposal on May, 30 2012. However, committee members have recommended that another year of fisheries dependent work would add significant strength to the dissertation.

Project Objective: Real-time fleet communication system

Since January 2011, 13 mid-water trawl vessels have participated in three alosine bycatch avoidance systems. These voluntary bycatch avoidance systems operated under the hypothesis that alosines do not continuously school with Atlantic herring and mackerel while at sea. Therefore, with enough information and clear, quick communication, areas for vessels to fish that contain adequate amounts of target species but not large amounts of alosines could be identified. The following steps were taken to implement an initial voluntary bycatch avoidance program for mid-water trawl vessels landing in Massachusetts during the 2011 winter fishery (January-March);

Determine Catch Information Source: One requirement of a near-real time information system is a reliable data source that systematically calculates bycatch rates and discloses fishing locations (Gauvin et al., 1996). Two programs, the Northeast Fisheries Observer Program (NEFOP) and the MA DMF portside sampling program, provided these data. The MA DMF portside sampling program samples approximately 50% of all Massachusetts landings and prior

to 2010 about 85% of all mid-water trawl landings occur in Massachusetts (MA DMF, unpublished data). Edited trip level catch composition is available about 48 hours after a vessel lands. Tow locations were available through MA DMF trip logs voluntarily completed by vessel captains. From 2009-2010 the NEFOP sampled about 40% of Atlantic herring mid-water trips, though about two-thirds of these samples were from July to December (NEFMC, 2012). Uncorrected tow level data were available about 5 days after a vessel landed (Beagley personal comm.). Due to coverage rates and timeliness, the MA DMF portside sampling program was the primary information source for this study while NEFOP data provided tow level catch information for trips with multiple tows and high alosine bycatch.

Reduce spatial scale: The Atlantic herring and mackerel fisheries range from coastal waters to a maximum of 66°E. During the winter, fishing effort occurs south of Cape Cod, MA to Virginia. A program over this entire range could make communications cumbersome and contains numerous alosine hotspots. An alternative approach was to conduct the program in one specific high bycatch area (Gauvin et al 1996, O'Keefe et al. 2010). Based on historic MA DMF port sampling, NEFOP data and Cournane and Correia (2010) an approximately 60x70 nm area off the coast of New Jersey was identified as the target bycatch hotspot (Figure 1).

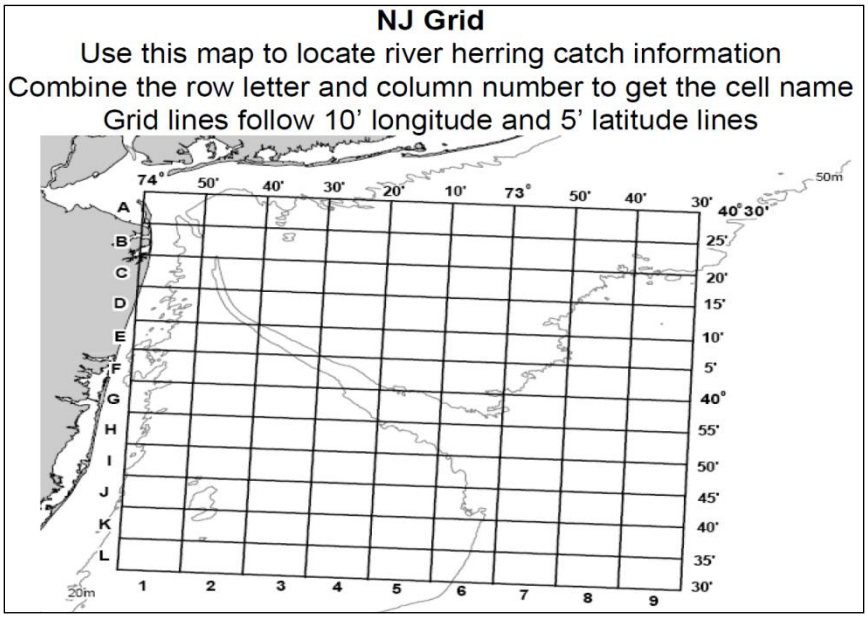

Figure 1. Area of focus for winter 2011 bycatch avoidance system. This handout was distributed to captains and used to communicate bycatch information.

Determine Thresholds to Classify Catches: Large catches of alosine in the mid-water trawl fishery are uncommon but account for the vast majority of alosine bycatch. From January 2000 through September 2010 the top 10% of tows with alosine bycatch (all tows with greater than 2,000kg of alosines) accounted for over 80% of NEFOP observed alosine mid-water trawl bycatch by weight (Figure 2). Thresholds were set to identify trips with these large tows (Table 1). Ratio thresholds were used instead of hard numbers to avoid biases created by small tow or trip sizes. A ratio of 1:81kg (Alosine: Target species) identified a trip in the top 10% of alosine bycatch events while a ratio of 1:425 suggested a lower bycatch event (Table 1). These ratios

were used to classify trips as having high (1:80, greater than 1.25% alosines), low (1:425, less than 0.2% alosines), or moderate (between 1:80 and 1:425) amounts of bycatch.

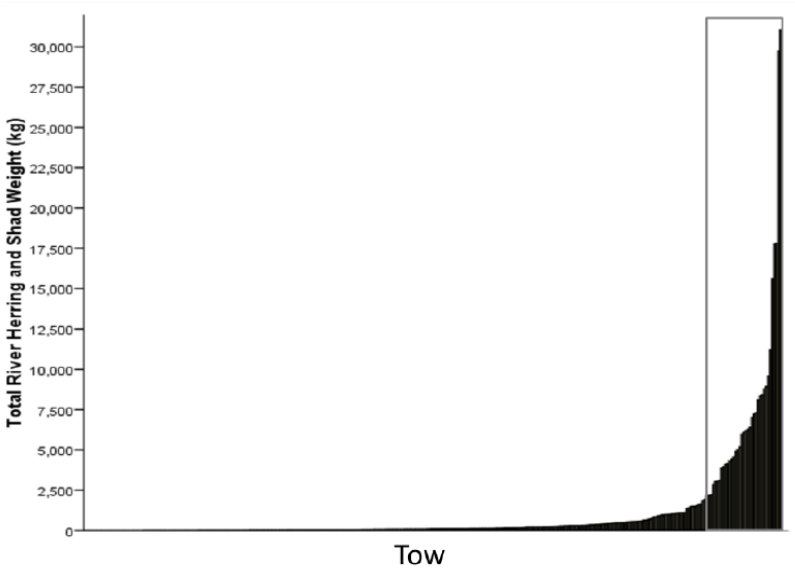

Figure 2. Northeast Fisheries Observer Program observed mid-water trawl tows from January 2000-Septermer 2010 ranked lowest to highest by amount of bycatch. Of the 343 tows shown in the figure the 35 tows with the most bycatch (grey box, top 10%) account for about 80% of observed bycatch.

Table 1. Of 72 trips sampled by Massachusetts Division of Marine Fisheries portside sampling from May 2008-July 2010, 55 had greater than 1kg of alosine bycatch. The six trips with the most bycatch (top 10%) all had greater than or equal to 2,000kg and a ratio less than 1kg of alosines:81kg of target species. Trips with a ratio greater than 1:425 all had less than 900kg of bycatch. Based on this, ratios of 1:80 (1.25%) and 1:425 (0.2%) were used to indicate high and low bycatch trips, respectively. Ratios between the two represented a buffer and identified a moderate trip.

Trip rank (total alosine bycatch)	Alosine:Target ratio (kg)
1	1:49
2	1:26
3	1:63
4	1:81
5	1:72
6	1:64
14-55	>1:425

Develop Communication System: Vessels notified the MA DMF and SMAST through their shipboard e-mail system of their departure and landing times, hail weights, landing ports and other information. These emails allowed MA DMF portside samplers to meet vessels at ports and sample entire offloads. Edited and expanded catch data were relayed by MA DMF staff to SMAST less than 48 hours after vessels completed their offloads. This information as well as tow locations (from MA DMF trip logs) and any available NEFOP information was then accumulated and transformed into a weekly or bi-weekly bycatch advisory that was emailed to vessels. Bycatch information was accessed and shared with captains using a coded, grid system of small cells approximately 5x8 nm that was distributed to them (Figure 1). Based on the pace of the fishery weekly or bi-weekly advisories via email were appropriate. Advisories classify areas as either having low, moderate, or high bycatch and contained other information such as weekly bycatch rates or catches of river herring outside of the areas of focus. Information was not reported for cells without tows, and advisories only included information less than two weeks old. Cumulative bycatch information is available through the SMAST website (http://www.smast.umassd.edu/Bycatch_Avoidance/index.php).

Using the methods described above (currently being reviewed for publication in Fisheries Research see Bethoney et al Submission), two additional avoidance systems were implemented in the fall of 2011 and winter of 2012. The fall 2011 system targeted an area in the Gulf of Maine identified as a high river herring bycatch area. Due to a limited amount of Atlantic herring Total Allowable Catch when the Atlantic herring spawning area closure was opened to mid-water trawl vessels, fishing activity occurred for approximately two weeks. Information indicating alosine bycatch was unlikely to occur at depths greater than 73m was circulated prior to the launching of the bycatch information system. In the winter of 2012, the scope of the avoidance system was expanded to include an area off Rhode Island that is heavily utilized by the mid-water fleet.

Progress towards Value at Grant Completion: Reduced bycatch

Year to year bycatch reduction should not be used as the primary metric to evaluate the success of this system to reduce bycatch because of potential changes in alosine populations levels, inter-annual variability in alosine catchability, and the nature of bycatch in the fishery (Figure 2). Alosine biomass fluctuations could increase or decrease bycatch amounts independent of avoidance measures. Overlap between mid-water trawl effort and alosine distribution varies inter-annually due to environmental factors and fleet behavior (Kritzer and Black 2009). A single trip within an avoidance area could contain a larger amount of alosines than observed during the entire previous year. If the location of this catch was shared with the fleet, the area was avoided and an area with low bycatch was identified, the system should not be classified as a failure. Based on these reasons evaluation methods should focus on intra-annual metrics of industry participation, consistent, low bycatch in identified areas, and reduced intra-annual bycatch rates (Abbot and Wilen 2010).

Winter 2011: High levels of cooperation by industry members, fishing patterns within the avoidance area, and the appearance of distinct spatial and temporal bycatch patterns within the avoidance areas suggests near-real time communications may have resulted in reduced alosine bycatch. Nine of the 12 active mid-water trawl vessels fishing for Atlantic herring and mackerel participated in the near-real time information system (two of the active mid-water trawl vessels were not recruited to participate because they were landing in New Jersey and primarily targeting

squid but these vessels have participated in subsequent avoidance programs). Approximately 150 emails (indicating departing and landing location, dates and times as well as catch size) were received from these vessels and processing plant managers. A high percent of MA DMF trip logs (containing spatial, temporal and qualitative tow information) were completed by captains of participating vessels. Initial effort was focused in the northwest portion of the avoidance grid. Cells fished in this area were identified as having low or moderate bycatch until an advisory on February 17th identified cell E3 as having high bycatch (Figure 3). This area remained a high bycatch area throughout the fishery as E3 was reentered resulting in another high bycatch event and an additional advisory. After February 17th until the end of the fishery, the mean vector of observed effort was 115 degrees ± 35 degrees (r=0.75, n=8) and significantly different from the direction of the high bycatch area (270 to 360 degrees, Figure 4). The directions are in relation to a center point, placed at the lower right corner of cell E3 (Figure 4). This region, depicted in Figure 4, was chosen as the high bycatch region because it contained multiple moderate cells and a high cell that were identified early enough to expect a quantifiable reaction. The direction of mean effort after February 17th pointed towards the southeast region of the avoidance grid. This region of the avoidance grid was identified as a low bycatch area through an advisory issued on February 25th (Figure 3).

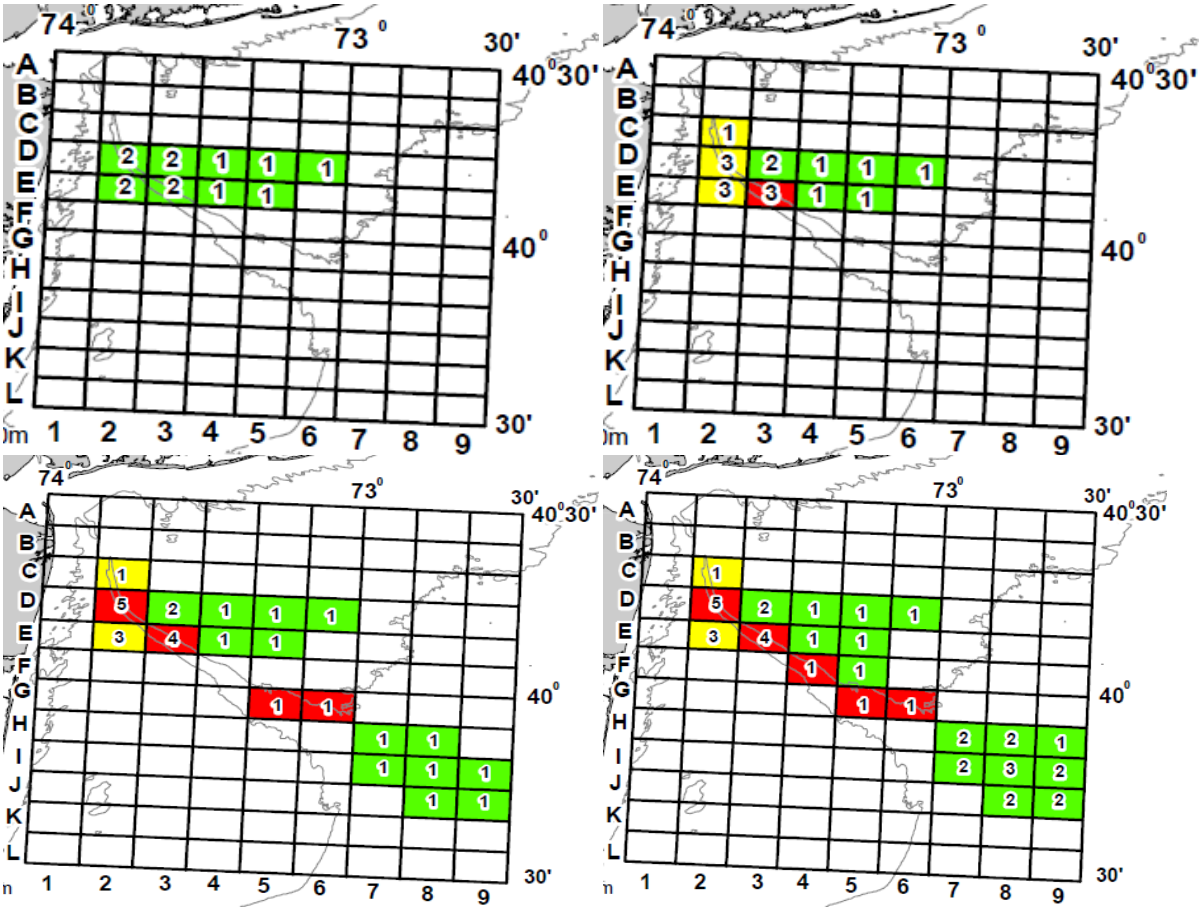

Figure 3. Cumulative bycatch information from 4 different time periods during the winter of 2011, from top left: 2/1, 2/17, 3/2, 4/1. Numbers inside cells indicate the number of tows

within each cell. Red indicates cells with high alosine bycatch while yellow and green indicate moderate and low respectively.

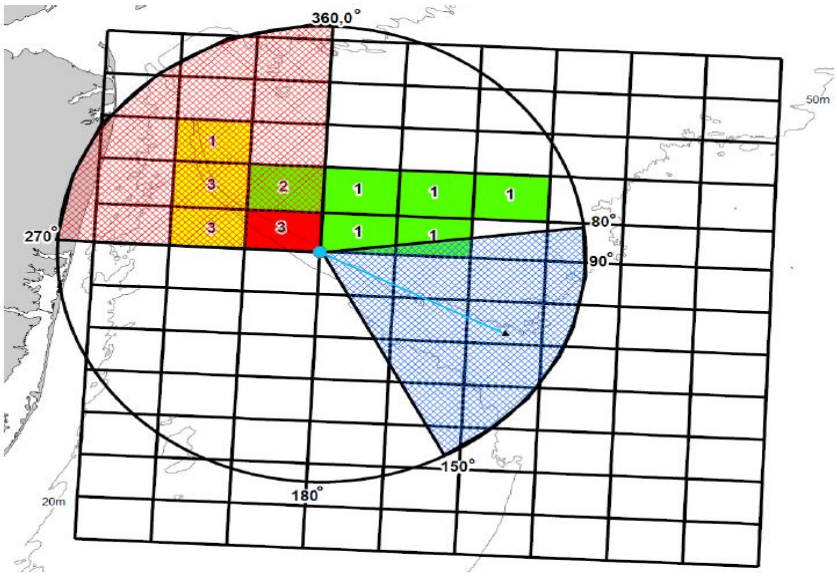

Figure 4. Cumulative alosine bycatch information through February 17th as well as mean direction vector of tow locations (blue arrow) and 95% confidence interval (blue cross-hatch) after February 17th. The vector direction relates to a center point (blue circle) placed at corner of the high bycatch area (red cross-hatch). Numbers inside cells indicate the number of tows within each cell. Red indicates cells with high bycatch while yellow and green indicate moderate and low, respectively.

The overall behavior of the vessels within the avoidance area provides evidence of cooperation (Figure 4). Though the significant shift in tow locations away from the high bycatch area to the southeast could be due to the availability target species, the timing of this shift coincides with bycatch advisories and avoidance of a known high bycatch area. Reentry into the high bycatch cell shows that target species were present in both the northwest and southeast portions of the avoidance grid simultaneously (Figure 3). In total 5 cells were classified as having high bycatch with only one possibly reentered

The appearance of distinct spatial and temporal bycatch patterns within the avoidance area suggests vessels can avoid large catches of alosines within the spatial scale used for this study. The percentages of effort, target catch, and alosine catch, based on MA DMF trip logs and port-sampling, in the northwest region (above row H, Figure 3) and southeast low bycatch region (row H and below, Figure 3) are displayed in Table 2. Based on the occurrence of high and moderate catches of alosines, it appears that alosines initially were absent from the northwestern part of the avoidance grid in large quantities but moved into this area as the winter progressed (Figure 4, Table 2). As effort shifted further offshore to the southeast later in the season, no high or moderate catches of alosines occurred, suggesting a high abundance of target fishes but not

alosines. In addition, the only re-entry into a high bycatch cell, after about 8 days, resulted in another high bycatch event. This displays a degree of temporal stability in the bycatch pattern, which is essential to an effective avoidance system (Abbot and Whilen, 2010; Gauvin et al., 1996). Though the timing of migrations, exact routes and distribution undoubtedly varies from year to year, the catch pattern observed suggests mid-water trawl vessels can be moved to areas with low alosine bycatch and adequate levels of target species using the scale of this study (Table 2).

Table 2. Percentage of trips, target catch, and alosine catch in two separate regions of a voluntary bycatch avoidance area. For trips comprised of tows in both areas, estimated tow weights (by vessel captains) were used for the amount of target catch, while portside sampling amounts of alosines were assigned to a single tow identified by the Northeast Fisheries Observer Program.

Northwest Area			**Southeast Area**		
Trips	Target Catch	Alosine Catch	Trips	Target Catch	Alosine Catch
75%	75%	97%	25%	25%	3%

Intra-annual bycatch reduction was tested by comparing bycatch rates calculated from NEFOP data of participating vessels to a control group. The three active mid-water trawl vessels not in communication or completing MA DMF trip logs during the winter of 2011 were identified as the control group. Bycatch rates (alosine kg/ target mt) are a better measurement of bycatch reduction than total alosine catch, because rates are comparable across different catch and vessel sizes, reflect productivity, and match the definition of bycatch classifications given to SFC members. Though the avoidance systems only alters vessel behavior within areas of focus, the system assumes the majority of bycatch occurs within these areas. Incorporating bycatch rates from all areas could reveal if this assumption is correct and increase sample size. Intra-annual past seasonal (December-April) bycatch rates (2008-2010) of the control and participating vessels for each avoidance system was compared to test if bycatch rates were different before the avoidance system. No significant difference was found between the bycatch rates of control in participating vessels in any year (Figure 5, Mann-Whitney U Test's, all p-values >0.2). However, in 2011 the difference between the mean bycatch rate of participating and control vessels was greatest and the lack of significance is likely due to variance (sample size of control vessels was only 6 tows) and not similarity.

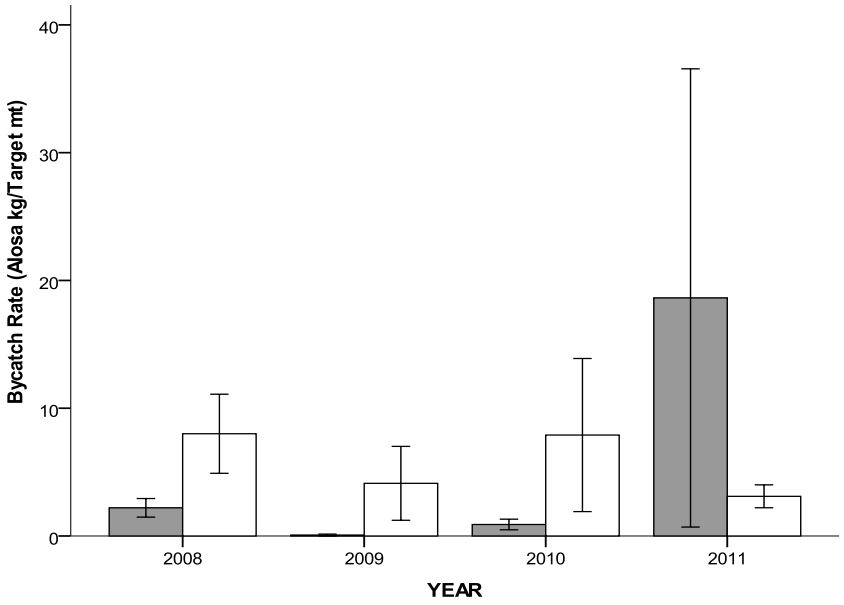

Figure 5. Bycatch rates, calculated from Northeast Fisheries Observer Program documentation of vessels that participated in the winter 2011 avoidance system (white) and those that did not (grey). Past bycatch rates during previous winter seasons (December-April) are also shown. Error bars are ± 1 standard error.

Fall of 2011: Similar to the winter of 2011, industry cooperation and the separation of alosines and target species suggests this system may have resulted in decreased alosine catch. Captains and on-shore managers continued to notify the project of landing and departure times as well as completing MA DMF trip logs. In addition, 10 of the 11 active mid-water trawl vessels participated in the avoidance. Initial effort occurred in the northeast part of the grid with low bycatch (Figure 6). This information was shared with the fleet and effort continued there for the remainder of the two-week fishery with little alosine bycatch. Fifteen of the seventeen Massachusetts landings during the avoidance system were sampled by the MA DMF. These trips landed approximately 3,000 mt of Atlantic herring and less than 3 mt of alosines (MA DMF, Unpublished data). The mean tow depth of participating vessels was significantly deeper than 73m (97m,1-tailed t-test P=.02) and greater than in previous years (ANOVA, Tukey Post Hoc Ps<.01, except 2009 P=.43). NEFOP data from this time period has been requested but not yet received so the bycatch rates of participating and non-participating vessels cannot be compared. In addition, this comparison may not be appropriate because only one active vessel did not participate.

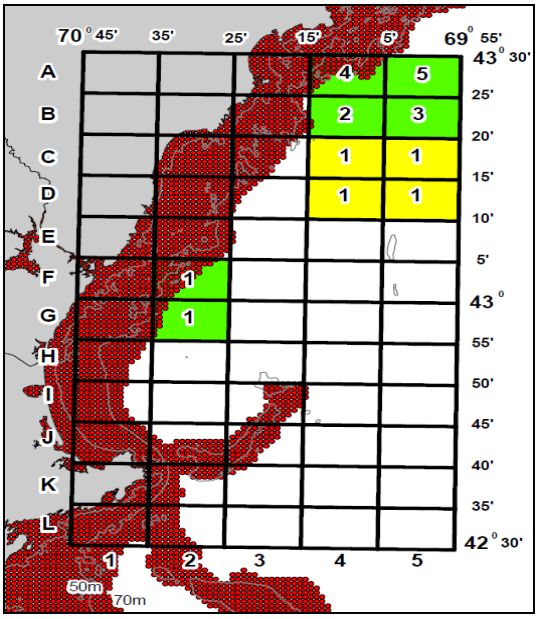

Figure 6. Cumulative bycatch information from fall 2011 avoidance system in the western Gulf of Maine. Numbers inside cells indicate the number of tows within each cell. Yellow and green indicate moderate and low bycatch events. Prior to the opening of the fishery, industry members were informed alosine bycatch was most likely to occur at depths less than 40 fathoms (73m, red dots).

Winter 2012: An avoidance system, covering an additional area off of Rhode Island, was run from mid-December until the Atlantic herring Management Area 2 was closed in mid-February (Figure 7). The results of this avoidance system have not been fully analyzed. Eight advisories were issued during this time period. Fleet participation was high (10 of 11 active vessels). After an advisory on February 4th identified high bycatch in the Rhode Island area, most participating vessels shifted their effort to the New Jersey area to pursue Atlantic mackerel and avoid river herring (D.Conneely personal comm.). One pair of vessels wanted to re-enter a cell classified as having high bycatch. This reentry was discussed and the captain felt, if he used a different technique, he could avoid catching river herring in this area. In his subsequent trip he returned to the high bycatch area and was able to reduce his bycatch percentage from 3.0% to 0.3% (MA DMF, Unpublished data).

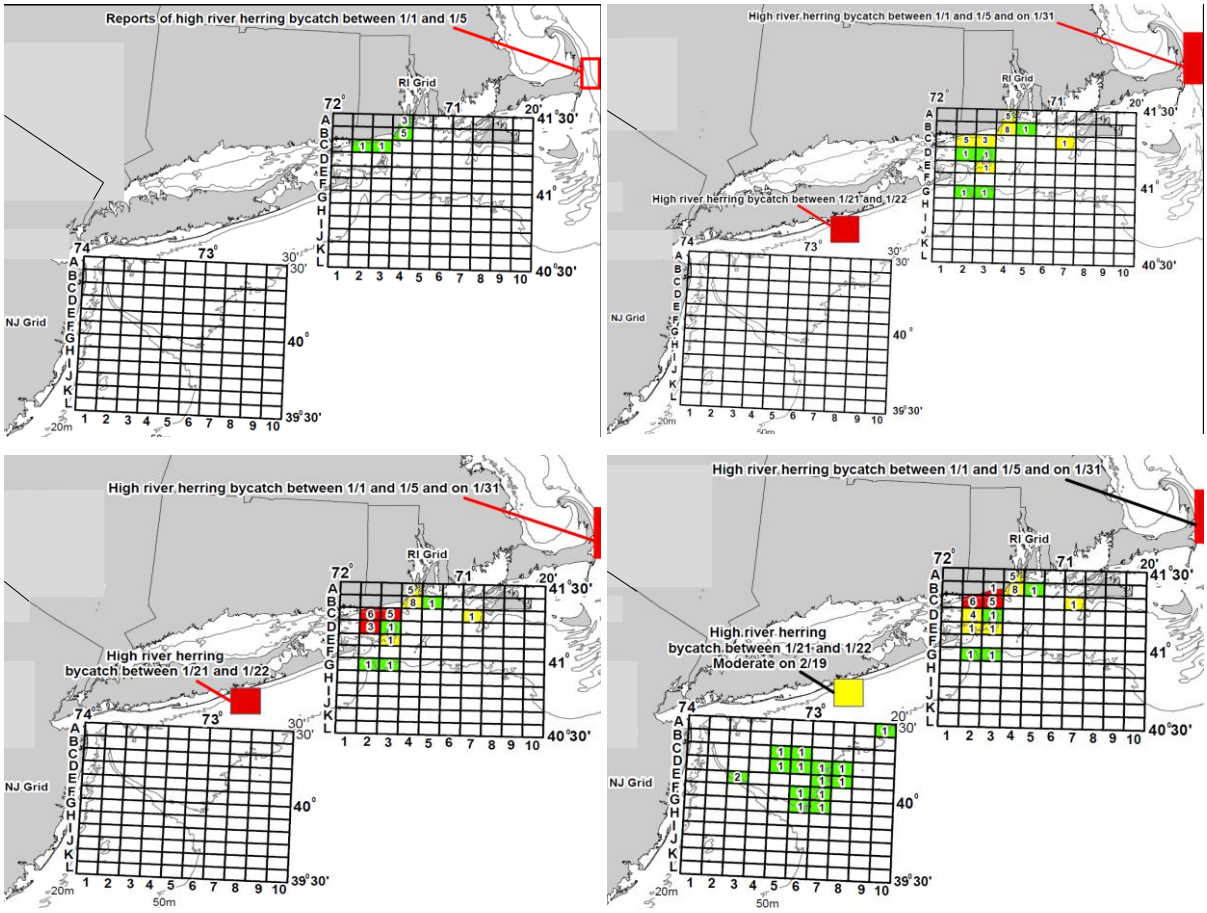

Figure 7. Cumulative bycatch information from 4 different time periods during the winter of 2012, from top left: 1/20, 2/1, 2/4,2/20. Numbers inside cells indicate the number of tows within each cell. Red indicates areas with high alosine bycatch while yellow and green indicate moderate and low respectively.

Overall, the amount and location of effort in the winter of 2012 was substantially different from the winter of 2011 (Figure 3, Figure 7). This difference was likely due to the availability of large schools of Atlantic herring in inshore waters that allowed the Area 2 quota to be taken by February 20th. In past years the vessels continued fishing for the target species in Area 2 until late March or early April and returned in December without reaching the area quota before the new fishing year. In addition, there was more effort off of Cape Cod and Long Island. No avoidance grid was placed near the backside of Cape Cod and disagreement about the spatial scale of information may have resulted in a high bycatch event. The moderate and high catches of alosines off of Long Island represent a bycatch pattern not previously document by any at sea monitoring program. In contrast, only low bycatch events were documented within the New Jersey avoidance area despite effort in similar areas at similar times (specifically cell E3, see Figures 3, 7). These points emphasize the importance of repeating this monitoring and avoidance effort for a third year as there is little past information to compare the amount, locations, and timing of alosine bycatch found in the previous two years. Further, the ability to conduct another avoidance system during the fall will reveal if previous results and bycatch patterns observed in 2011 are repeated 2012. Due to continued high participation by mid-water vessels, there is a lack

of a "control" group (one vessel not participating). If bycatch rates cannot be compared between vessels receiving bycatch information and those that are not, a new method to directly test the effect of these systems on bycatch may be needed. If a direct measure cannot be established, it will be critical to build as much descriptive evidence for bycatch reduction as possible.

Progress towards Value at Grant Completion: Replicable bycatch reduction program (program usable for small mesh fisheries)

In the winter of 2012, with funding from The Nature Conservancy, we replicated our near-real time bycatch information system in the Rhode Island small mesh bottom trawl fishery. Please see attached Nature Conservancy final repot draft for detailed information.

Outreach

Scientific Presentations

6/27/2011: "Developing an alternative scale to address river herring bycatch in U.S. Northwest Atlantic mid-water trawl fisheries". Poster presentation at Reconciling Spatial Scales and Stock Structure for Fisheries Science and Management, Portsmouth, NH

9/3/2011: "An information system to avoid river herring (*Alosa pseudoharengus, Alosa aestivalis*) bycatch in the Northwest-Atlantic". Oral presentation at the American Fisheries Society annual meeting, Seattle, WA

9/3/2011: "River Herring and American Shad Bycatch Avoidance in Atlantic Herring and Mackerel Mid-Water Trawl Fisheries". Oral presentation at the American Fisheries Society annual meeting, Seattle, WA

10/27/2011: "River Herring and American Shad Bycatch Avoidance in Atlantic Herring and Mackerel Mid-Water Trawl Fisheries". Oral presentation at the Northeast Regional Collaborative Research Conference, Portsmouth, NH

9/27/2012: "Quantifying and reducing river herring bycatch in the U.S. northwest pelagic trawl fisheries" Abstract submitted to ICES Annual Science Conference, Bergen, Norway

Scientific Publications

"Developing a fine scale system to address river herring (*Alosa pseudoharengus, A. aestivalis*) and American shad (*A. sapidissima*) bycatch in the U.S. Northwest Atlantic mid-water trawl fishery" Under review by Fisheries Research

Management/Public Presentations

12/20/2011: Oral presentation to the NEFMC Herring Oversight Committee and Advisory Panel

6/30/2011: Poster presentation to NEFMC Plan Development Team

10/11/2011: Oral presentation to MAFMC

2/7/2012: Oral presentation to ASMFC Shad and River herring Management Board

Management/Public Publications

Avoidance system listed as possible river herring bycatch reduction alternative in the NEFMC Amendment 5 to the Atlantic herring Fishery Management Plan

Information from project included in NEFMC Amendment 5 Environmental Impact Statement

Avoidance system listed as possible river herring bycatch reduction alternative in the MAFMC Amendment 14 to the squid, mackerel, butterfish Fishery Management Plan

4/2/2012: "Experts team up to reduce bycatch", New Bedford Standard Times.

5/2012: "Avoidance program IDs river herring hot spots", Commercial Fisheries News

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Project Objective: Refine "hot spot" data and develop predictive model

Through discussions with Drs. Eric Palkovacs and Andre Boustany at the Duke University Marine Laboratory (who are working on a National Fish and Wild Foundation project with a similar objective), it was agreed that they would focus on predicting river herring distributions throughout all seasons, while our project would focus on predicting distributions during the winter and applying these findings to bycatch reduction. To achieve this object, we are testing if oceanographic features can be used to indicate areas with a high probability of large catches of alosines, Atlantic herring and Atlantic mackerel. The National Marine Fishery Service (NMFS) bottom trawl and NEFOP mid-water trawl data sets contain catch at sea data useful for achieving this goal. Restricting our analysis to the winter allows us to focus on the region (south of Cape Cod, Massachusetts) and time where the NMFS bottom trawl survey and the mid-water trawl fishery overlap, where the most alosine bycatch occurs, and reduces seasonal and regional factors. Based upon the environmental measurements taken at sea by the NMFS bottom survey and past studies, the variables sea surface temperature, bottom temperature, the difference between sea surface and bottom temperature, bottom salinity, surface salinity and depth were examined for a relationship to catch at sea.

If correlations are found between environmental factors and catch at sea, results could be used to identify specific pathways or areas associated with each species. The utility of this information to reduce bycatch could then be tested using the NEFOP mid-water trawl dataset and the Finite-Volume Community Ocean Model (FVCOM). FVCOM is a verified prognostic coastal ocean circulation model that incorporates realistic time-dependent temperature projections and can be used to identify oceanographic conditions on a daily basis from 2000-2009 (Chen et al. 2003, Chen et al. 2006, Cowles 2008). FVCOM environmental data was joined to NEFOP catch at sea data through at stepwise process in ArcGIS 10. Hindcast environmental conditions were mapped using natural neighbor interpolation to create a continuous surface of temperature, salinity and depth values from the FVCOM data points. Natural neighbor interpolation uses continuous, area-based weighted averages to create a structured surface of points based on existing data points and does not interpret trends (therefore all values are within the range of real data). The result is a smoothed distribution, making it appropriate for variables that are influenced by adjacent areas (Tsai et al. 2005). NEFOP catch-at-sea data was then be plotted with an area of uncertainty for catch location. Catch locations were assigned a catch radius equal to the average straight line tow distance because most mid-water trawl vessels turn during a tow; eliminating the usefulness of the tow end location. The NEFOP catch locations were then joined to the environmental conditions they overlapped with in time and space. This created a new dataset that could be used to compare much bycatch and target catch was within predicted alosine "hot spots".

Progress towards Value at Grant Completion: Predictive maps

For all five species the NMFS data set is dominated by samples without catch but that may contain relevant environmental information. Based upon this and graphs of abundance and presence/absence of each species against environmental variables, we attempted to use logistic regressions to find correlations between environmental variables and catch at sea. Logistic regression models can provide equivalent qualitative results as more complex statistical approaches (Fletcher et al. 2005, Lewin et al. 2010). Logistic regressions relate binary response variables to predictor variables by identifying a probability of occurrence as a function of the

predictor variables (Hosmer and Lemeshow 2000). Catch at sea of alewife, blueback herring, American shad, Atlantic herring, and Atlantic mackerel was transformed into a binary variable by classifying the fishes as present or absent in a tow or by using a threshold amount. However, catch at sea patterns within the NMFS bottom trawl dataset fitted logistic regression models poorly. When environmental variables were transformed, through squaring or square rooting, results did not make sense from a biological perspective despite indications of a good fit to the logistic regression model. Therefore, we have changed our approach and are now using a likelihood ratio test (G test). The G-test can be used to test if the probability of catch at sea is uniform across an environmental variable range. Further, if the initial test yields significant results, the G-test statistic is additive allowing for the results of several G-tests to be summed. This allows for ranges of equal probability of catch to be identified (Sokal and Rohlf 1995). Using this method we have identified several ranges of environmental variables with significantly different probabilities of alewife catch within the NMFS bottom trawl survey (Table 3). In addition, the probability of Atlantic herring catch differs with ranges of sea surface and bottom temperature (Table 3). We plan to continue using the G-test method to test the remaining environmental variables and species of interests. These result could then be analyzed and combined to create predictive maps of where alosines are most likely occur during the winter. The utility of this information to reduce bycatch could then be evaluated by comparing the environmental ranges associated with alosines to Atlantic herring or mackerel and catch within the NEFOP/FVCOM database .

Table 3. Preliminary results of G-test analysis to identify marine preferences for alewife, blueback herring, American shad, Atlantic herring and mackerel. The probability of catch within a given range is homogenous, while the probability of catch between groups is significantly different (Unplanned tests for homogeneity with Dunn-Šidák Correction). Blank spaces indicate a repeated cell value.

Feature	Species	Range	Proportion Present
Sea Surface Temp. (^{o}C)	Atlantic herring	1-3,5-7	0.60
		4	0.52
		8-9	0.25
		10-11	0.05
	Alewife	1-6	0.51
		7	0.37
		8-9	0.20
		10-11	0.05
Bottom Temp. (^{o}C)	Atlantic herring	6-7	0.70
		1-5	0.56
		8	0.42
		9	0.25
		10	0.12
		11-13	0.05
	Alewife	1-7	0.47
		8-9	0.25
		10-14	0.15
Sea Surface-Bottom Temp. (^{o}C)		-8--4,-2-0	0.36
		1-2,-3	0.28
		3	0.05
Surface Salinity (PPT)		20-30,32-33	0.45
		31,34	0.25
		35	0.03
Bottom Salinity (PPT)		24-33	0.45
		34	0.34
		35	0.16
		36	0.09
Depth (m)		41-80	0.46
		0-30,101-110	0.33
		31-40,81-100,111-291	0.24

Outreach

Scientific Presentations

6/26/2012: "The utility of environmental predictors of catch to reduce bycatch in the northwest Atlantic mid-water trawl fishery" Abstract accepted to The Relative Importance of Fishing and the Environment in the Regulation of Fish Population Abundance, A Symposium of the American Institute of Fishery Research Biologists, New Bedford, MA

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Tsai FT, Sun N, Yeh WW. 2005. Geophysical parameterization and parameter structure identification using natural neighbors in groundwater inverse problems. J Hydrol 308:269-83.

Project Objective: Expand MA DMF Port-sampling Program

Collaboration with the SFC has been critical to the success of the portside sampling program. The 11 active SFC mid-water trawl vessels represent a significant portion of the Atlantic mackerel and herring mid-water trawl fleet. For example, 99% of NEFOP documented mid-water trawl Atlantic mackerel catch by weight in 2010 occurred on vessels that were part of the SFC (2 vessels observed in 2010 are no longer active). A fleet communication system was created in October 2010; vessels notify the MA DMF and SMAST through their shipboard e-mail system of their departure and landing times, hail weights and landing ports. Notification of landing times and other information allows portside samplers to easily meet vessels at ports and sample entire offloads. Additionally, captains voluntarily complete MA DMF trip logs that reveal tow locations, weights and other information.

The MA DMF port sampling program was a reliable and timely source of catch composition and, in general, the proximity of tows within a trip or the lack of bycatch made trip level catch information equivalent to tow by tow information. Coordination between the MA DMF and the NEFOP has maximized the number of trips observed and the speed of information exchange with the added ability to address uncertainties created by trip level catch information. Without the higher coverage rates of the portside sampling program the second highest catch of alosines observed during the winter 2011 avoidance system would have gone unnoticed. Without the tow by tow information of the NEFOP, a low bycatch area would have been misclassified as a high bycatch area.

The MA DMF completed a pilot comparison of NEFOP sea sampling estimates of river herring bycatch to portside sampling estimates. This study was presented to the Atlantic herring Plan Development Team (PDT) and, in contrast to a previous study, found good agreement between portside and at sea estimates (for detailed methods see attached Support Document B). However, this analysis only included 30 co-sampled mid-water trawl trips. Including co-sampled trips since the completion of the study and after June 30, 2012 would make the analysis more robust.

Progress towards Value at Grant Completion: 50% fleet coverage

Since the implementation of the project on October 1, 2010 MA DMF has sampled 13 of the 14 vessels that have landed in Massachusetts ports, and 164 out of 328 trips (as of 5/23/12).

Outreach

Management/Public Presentations

Information gathered by the MA DMF port-sampling program is used to inform MA DMF employees on Regional Councils, Plan Development Teams, and through other decision making avenues.

Introduction

This document presents a summary of the 2012 benchmark stock assessment for alewife and blueback herring, collectively referred to as river herring. The assessment was peer-reviewed an independent panel of scientific experts through the Atlantic States Marine Fisheries Commission's (ASMFC) External Peer Review process. This assessment is the latest and best information available on the status of the Atlantic river herring fisheries management.

Management Overview

The Fishery Management Plan (FMP) for Shad and River Herring was one of the very first FMPs developed at the ASMFC in 1985. In 1994, the Shad and River Herring Management Board determined that the FMP was no longer adequate for protecting or restoring the remaining shad and river herring stocks. Amendment 1 was adopted in 1998 and required specific American shad monitoring programs, as well as recommended fishery-dependent and independent monitoring programs for river herring and hickory shad, in order to improve stock assessment capabilities.

In 2009, the Shad and River Herring Management Board approved Amendment 2, which strengthened river herring management. The Amendment prohibits state waters commercial and recreational fisheries beginning January 1, 2012, unless a state or jurisdiction has a sustainable management plan reviewed by the Technical Committee and approved by the Management Board. The Amendment defines a sustainable fishery as "a commercial and/or recreational fishery that will not diminish the potential future stock reproduction and recruitment." Submitted plans must clearly demonstrate that the state's or jurisdiction's river herring fisheries meet this new definition of sustainability through the development of sustainability targets which must be achieved and maintained. Amendment 2 required states to implement fisheries-dependent and independent monitoring programs, and contains recommendations to member states and jurisdictions to conserve, restore, and protect critical river herring habitat. As of January 1, 2012, the Shad and River Herring Management Board approved sustainable fishery management plans for Maine, New Hampshire, New York, North Carolina and South Carolina.

What Data Were Used?

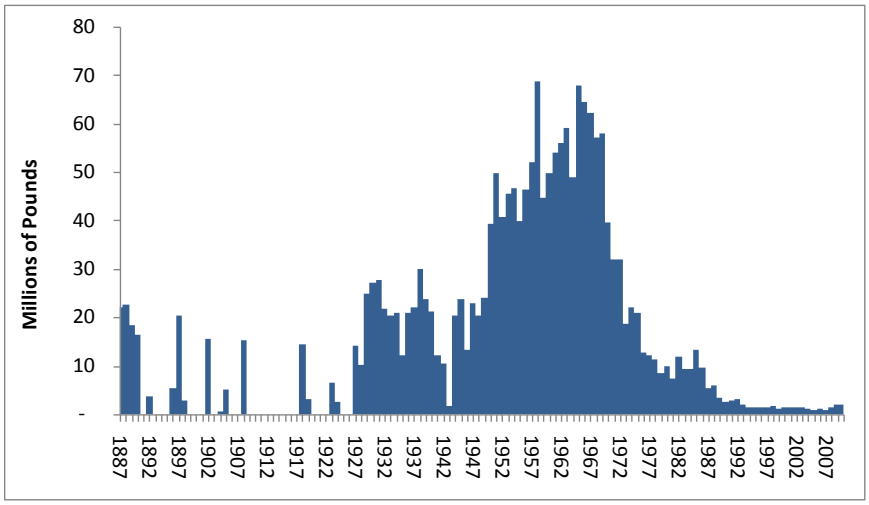
The river herring assessment used both fishery-dependent and -independent data as well as information about river herring biology and life history. Fishery-dependent data come from commercial fisheries that target river herring or catch them incidentally, while fishery-independent data are collected through scientific research and surveys. Data from a total of 57 river systems from Maine through Florida were included in this assessment.

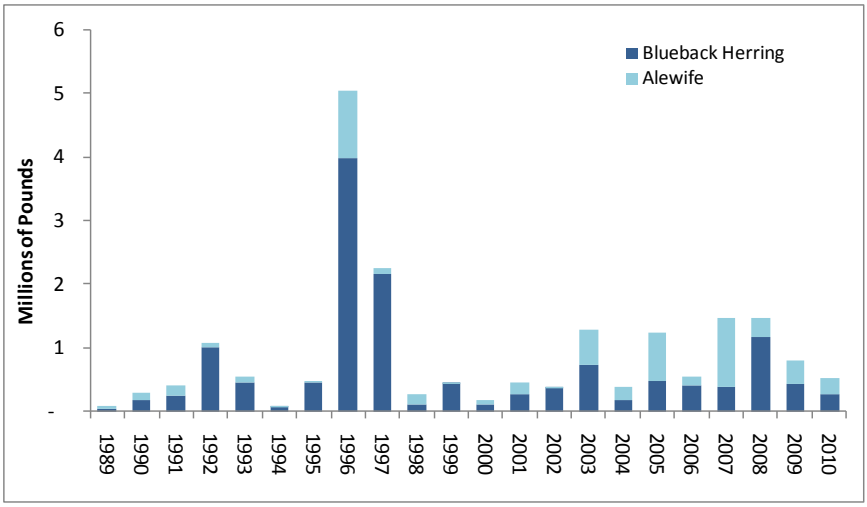
Life History

River herring are anadromous, like salmon, meaning they live in the ocean but spawn in freshwater. River herring spawn in the spring in rivers from Florida through Maine and up into Canada. The newly spawned fish migrate out of the rivers into the ocean in the fall, where they spend the next three to five years of their life. When they are sexually mature, they return to the river where they were born to spawn. Unlike salmon, river herring do not all die after spawning and may return to spawn several times over the course of their lives. The oldest observed ages for river herring are 14 years for alewife and 11 for blueback herring, but the oldest fish seen in rivers today are six to eight years old.

Fishery-Dependent Data

River herring are caught in a number of different fisheries, both as a target species and as bycatch. Because alewife and blueback herring are difficult to tell apart, commercial landings cannot be separated by species and instead are reported here simply as "river herring." The assessment included historical landings back to 1887, although the fisheries that target river herring date back to colonial times. Reported commercial landings of river herring peaked in 1965 and declined steadily and rapidly after that. The earliest years of data are not complete; they include records from only some states and rivers. The quality of the data has improved as reporting requirements have become rigorous. The commercial landings come from a combination of NOAA Fisheries Service port sampling, dealer reports, and fishermen reports. In some river systems, biological samples were available from the commercial catch to describe the age and sex composition. The assessment also examined time-series of commercial catch-per-unit-effort (CPUE), a fishery-dependent index of abundance, from some rivers where consistent measures of effort were available.





Figures 1 & 2. Commercial landings of river herring (combined alewife and blueback herring), 1887 – 2010 (top) and total incidental catch of alewife and blueback herring, 1989 – 2010 (bottom). Note: Only 2005 - 2010 include incidental catch estimates from mid-water trawls.

River herring are also caught as bycatch in ocean fisheries targeting other species such as Atlantic herring and mackerel. This incidental catch may be discarded at sea or retained and landed. Total incidental catch of river herring was estimated from sampling done by at-sea observers.

Although river herring are caught by recreational anglers, both as a target species and as bait for other gamefish like striped bass, there is very little data on recreational landings. The NOAA Fisheries Service Marine Recreational Fishing Statistics Survey, which tracks recreational saltwater landings, rarely encounters anglers fishing for river herring and, as a result, its estimates of recreational landings are highly uncertain and were not used in the assessment.

Fishery-Independent Data

The assessment examined run size indices from five states, young-of-year indices from 10 states, adult net and electrofishing indices from three states, and 19 fishery-independent trawl surveys conducted in coastal waters. The fishery-independent data sets represent a relatively short time series, compared to the long history of the fishery, and all of them were initiated after the peak and sharp decline in landings.

The run size indices are counts of river herring using fish passage or being lifted at dams. For some rivers, the counts represent the entire run. For other rivers, the counts represent an unknown fraction of the total run size, as not all the fish that return to the river to spawn utilize the available fish passage. Run size indices were only available for states in New England.

Young-of-year (YOY) indices track the relative abundance of river herring spawned each year and are conducted in rivers and bays. YOY indices were available for Maine through North Carolina.

State fishery-independent trawl surveys were conducted in nearshore coastal waters and bays and track the abundance of juvenile and adult fish. The NOAA Fisheries Service Northeast Fisheries Science Center bottom-trawl survey had the widest geographic range of the available trawl surveys, sampling both inshore and offshore waters from Massachusetts to North Carolina.

What Models Were Used?

River herring were assessed on a river-by-river basis where the data were available. For the vast majority of rivers, the data were not available to conduct a model-based stock assessment. Instead, trend analysis was used to identify patterns in the available fishery-dependent and -independent data sets. For three rivers – the Monument River in Massachusetts, the Nanticoke River in Maryland, and the Chowan River in North Carolina – data were available to construct statistical catch-at-age models. Spawning stock biomass per recruit analysis was used to calculate benchmarks for total mortality (Z), which were compared to estimates of Z from the observed age structure of adult alewife and blueback herring for rivers where those data were available.

State	River	Status Relative to Historic Levels/Recent Trends
ME	Damariscotta	Depleted[A], Stable[A]
	Union	Increasing[A] , Stable[A]
NH	Cocheco	Unknown[A,B], Stable[A,B]
	Exeter	Depleted[A], Increasing[A]
	Lamprey	Depleted[A], Unknown[A]
	Oyster	Depleted[B], Stable[B]
	Taylor	Depleted[B], Decreasing[B]
	Winnicut	Depleted[A,B], Unknown[A,B]
MA	Mattapoisett	Depleted[A], Unknown[A]
	Monument	Depleted[A], Unknown[A]
	Parker	Depleted[A], Unknown[A]
	Stony Brook	Depleted[A], Unknown[A]
RI	Buckeye	Depleted[A], Unknown[A]
	Gilbert	Depleted[A], Decreasing[A]
	Nonquit	Depleted[A], Decreasing[A]
CT	Connecticut	Depleted[B], Decreasing[B]
NY	Hudson	Depleted[A,B], Stable[A.B]
MD, DE	Nanticoke	Depleted[A,B], Decreasing[A,B]
VA, MD, DC	Potomac	Depleted[A,B], Unknown[A,B]
NC	Chowan	Depleted[A,B], Stable[A.B]
SC	Santee-Cooper	Depleted[B], Increasing[B]

Table 1. Status of select alewife and blueback herring stocks along the Atlantic coast. Status relative to historic levels is pre-1970. Recent trends reflects last ten years of data. A = Alewife only; B= Blueback herring only; A,B = Alewife and blueback herring by species

The assessment also attempted to model the coastwide population using a Depletion-Based Stock Reduction Analysis (DBSRA). This model was developed to estimate management parameters for data-poor stocks by determining what the unfished population size had to have been in order to sustain the observed catches without going extinct. However, the Peer Review Panel determined the reference points produced by the model were not credible and the model required further development before it was appropriate for management use.

What is the Status of the Stock?

Of the 52 stocks of alewife and blueback herring for which data were available, 23 were depleted relative to historic levels, one stock was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short.

Estimates of abundance and fishing mortality could not be developed because of the lack of adequate data. The "depleted" determination was used instead of "overfished" and "overfishing" because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but also habitat loss, predation, and climate changes.

Data and Research Needs

Efforts to assess the status of river herring on the Atlantic coast are hampered by a lack of data. The stock assessment identified a number of high priority research needs.

Estimates of total catch of river herring need to be improved through expanded observer and port sampling coverage to quantify additional sources of mortality, including bait fisheries and incidental catch in other fisheries. Genetic analysis and other techniques are needed to determine population stock structure along the coast and to quantify which stocks are impacted by mixed stock fisheries (including bycatch fisheries).

To reduce uncertainty in age determination, current ageing techniques for river herring should be assessed and validated using known-age fish, scales, otoliths and spawning marks. Ideally, states should conduct biannual aging workshops to maintain consistency and accuracy in ageing fish sampled in state programs.

Monitoring protocols and analyses should be developed and implemented to determine river herring population responses and targets for rivers undergoing restoration (dam removals, fishways, supplemental stocking, etc.), as well as to quantify and improve fish passage efficiency and support the implementation of standard practices.

Glossary

Age class: all of the individuals in a stock that were spawned or hatched in the same year. This is also known as the year class or cohort.

Catch-at-age: the number of fish of each age that are removed in a year by fishing activity.

Fishing mortality (F): the instantaneous (not annual) rate at which fish are killed by fishing

Natural mortality (M): the instantaneous (not annual) rate at which fish die because of natural causes (predation, disease, starvation, etc)

Spawning stock biomass per recruit analysis: an expanded form of yield per recruit analysis that incorporates maturity and fecundity information. These models provide a group of reference points that define the amount of spawning biomass to preserve to ensure a population can replace itself.

Statistical catch-at-age (SCAA) model: an age-structured stock assessment model that works forward in time to estimate population size and fishing mortality in each year. It assumes some the catch-at-age data have a known level of error.

References

ASMFC. 2012. River Herring Stock Assessment Report for Peer Review. Atlantic States Marine Fisheries Commission, Stock Assessment Report No. 12-2 (supplement), 1049 p.

ASMFC. 2009. Guide to Fisheries Science and Stock Assessments. Washington, DC. http://www.asmfc.org/publications/GuideToFisheriesScienceAndStockAssessments.pdf

Council staff requested that NERO staff Run several simulated caps to examine recent catch amounts from a cap perspecitive as well as the recent CVs.

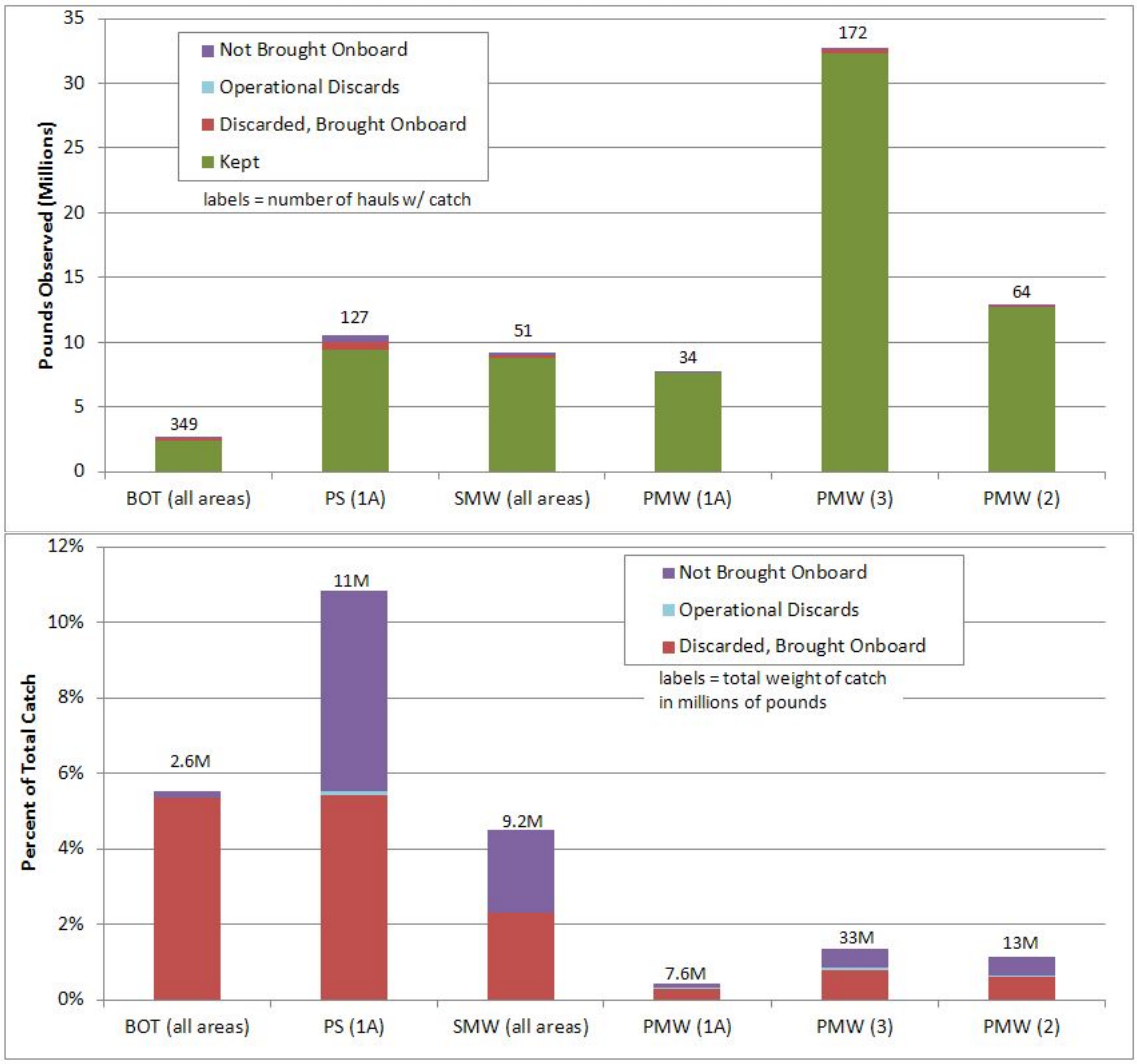
Run 1	**2011 river herring catch for trips with longfin ≥ 2500 lb**		**CV**
Longfin	32,820,353	Total kept_all from n = 1326 dealer trips	
RH	0.00137	2011 catch rate from n = 148 observed trips	
	44,812	Estimated river herring catch	0.42591
Run 2	**2010 river herring catch for trips with mackerel ≥ 20,000 lb**		
Mackerel	34,904,581	Total kept_all from n = 78 dealer trips	
RH	0.00500	2011 catch rate from n = 20 observed trips	
	174,643	Estimated river herring catch	0.49457
Run 3	**2009 river herring catch for trips with mackerel ≥ 20,000 lb**		
Mackerel	68,799,229	Total kept_all from n = 161 dealer trips	
RH	0.00267	2011 catch rate from n = 17 observed trips	
	183,501	Estimated river herring catch	0.65875

River herring includes alewife (nespp3 = 001) and blueback herring (nespp3 = 112)

Report run on May 29, 2012

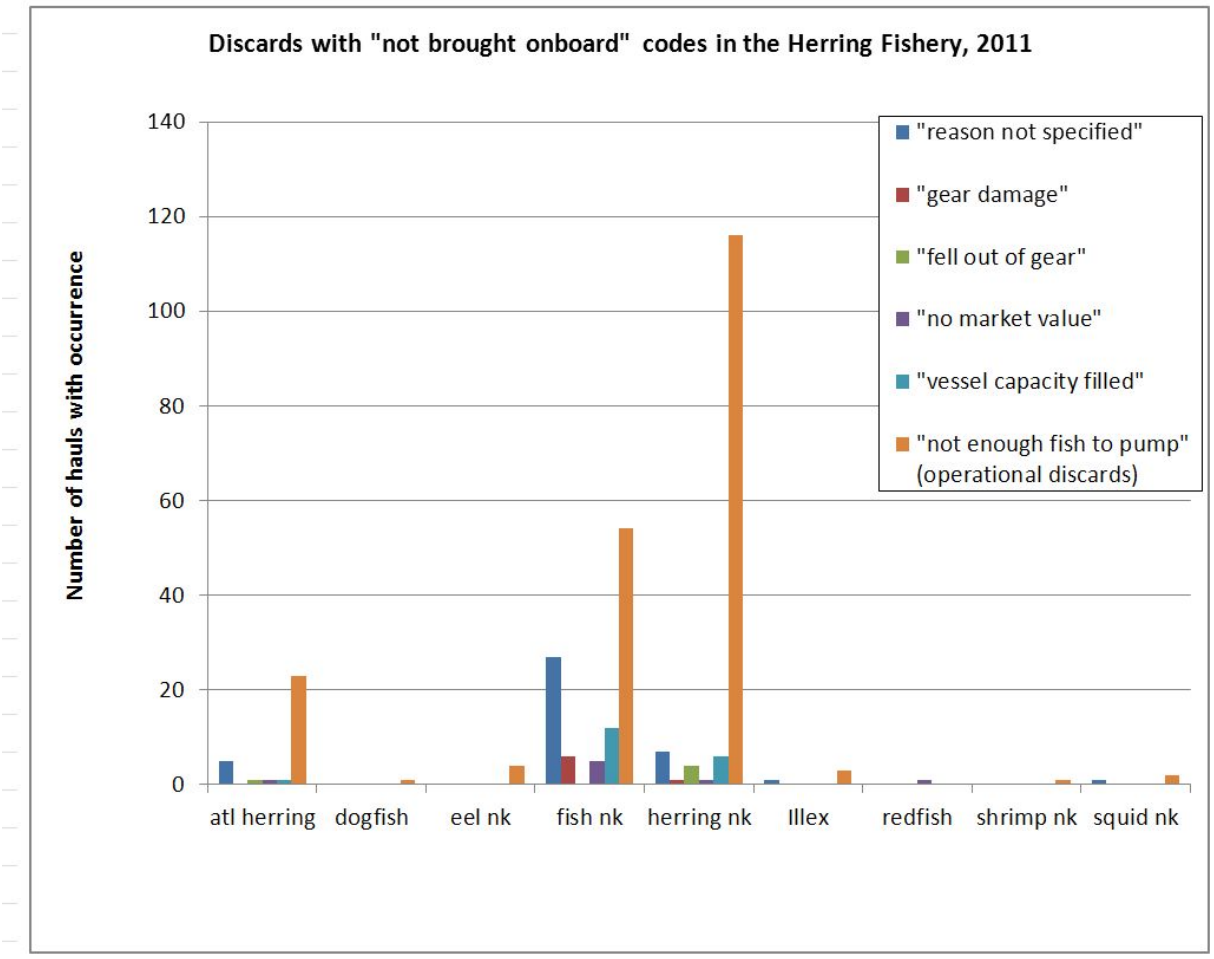
	NEFOP final data; 2010 catch for all trips following mackerel definition from J. Didden on paired and single mid water vessels only			
	Data are agregated over 8 trips, from 5 vessels that met the definition, for confidentiality purposes			
NESPP4	COMNAME	FISHDISP	FISHDISPDESC	SUM(HAILWT)
1120	HERRING, BLUEBACK	100	KEPT, GENERAL	702
1685	HERRING, ATLANTIC	001	NO MARKET, REASON NOT SPECIFIED.	4000
1685	HERRING, ATLANTIC	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	3.6
1685	HERRING, ATLANTIC	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	100
1685	HERRING, ATLANTIC	048	NOT BROUGHT ON BOARD, VESSEL CAPACITY FILLED	175
1685	HERRING, ATLANTIC	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	200
1685	HERRING, ATLANTIC	100	KEPT, GENERAL	3306139
2120	MACKEREL, ATLANTIC	001	NO MARKET, REASON NOT SPECIFIED.	300
2120	MACKEREL, ATLANTIC	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	4.6
2120	MACKEREL, ATLANTIC	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	50
2120	MACKEREL, ATLANTIC	048	NOT BROUGHT ON BOARD, VESSEL CAPACITY FILLED	175
2120	MACKEREL, ATLANTIC	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	100
2120	MACKEREL, ATLANTIC	100	KEPT, GENERAL	2020589
3474	SHAD, AMERICAN	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES	1.6
3474	SHAD, AMERICAN	100	KEPT, GENERAL	1134
3521	DOGFISH, SPINY	001	NO MARKET, REASON NOT SPECIFIED.	24312.5
3521	DOGFISH, SPINY	025	REGULATIONS PROHIBIT ANY RETENTION.	338
3521	DOGFISH, SPINY	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	25
3521	DOGFISH, SPINY	100	KEPT, GENERAL	2784
4180	BASS, STRIPED	001	NO MARKET, REASON NOT SPECIFIED.	8
4180	BASS, STRIPED	043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR	12
4180	BASS, STRIPED	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	10
5090	HAKE, SILVER (WHITING)	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	10
5090	HAKE, SILVER (WHITING)	100	KEPT, GENERAL	8065
5260	FISH, NK	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	5000
5260	FISH, NK	043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR	100
5260	FISH, NK	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	6265
5260	FISH, NK	099	DISCARDED, OTHER	1000
5260	FISH, NK	110	KEPT, TRANSFERRED TO ANOTHER VESSEL	136000
6600	HAKE, NK	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD	25
8010	SQUID, ATL LONG-FIN	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED	3
8010	SQUID, ATL LONG-FIN	100	KEPT, GENERAL	1681

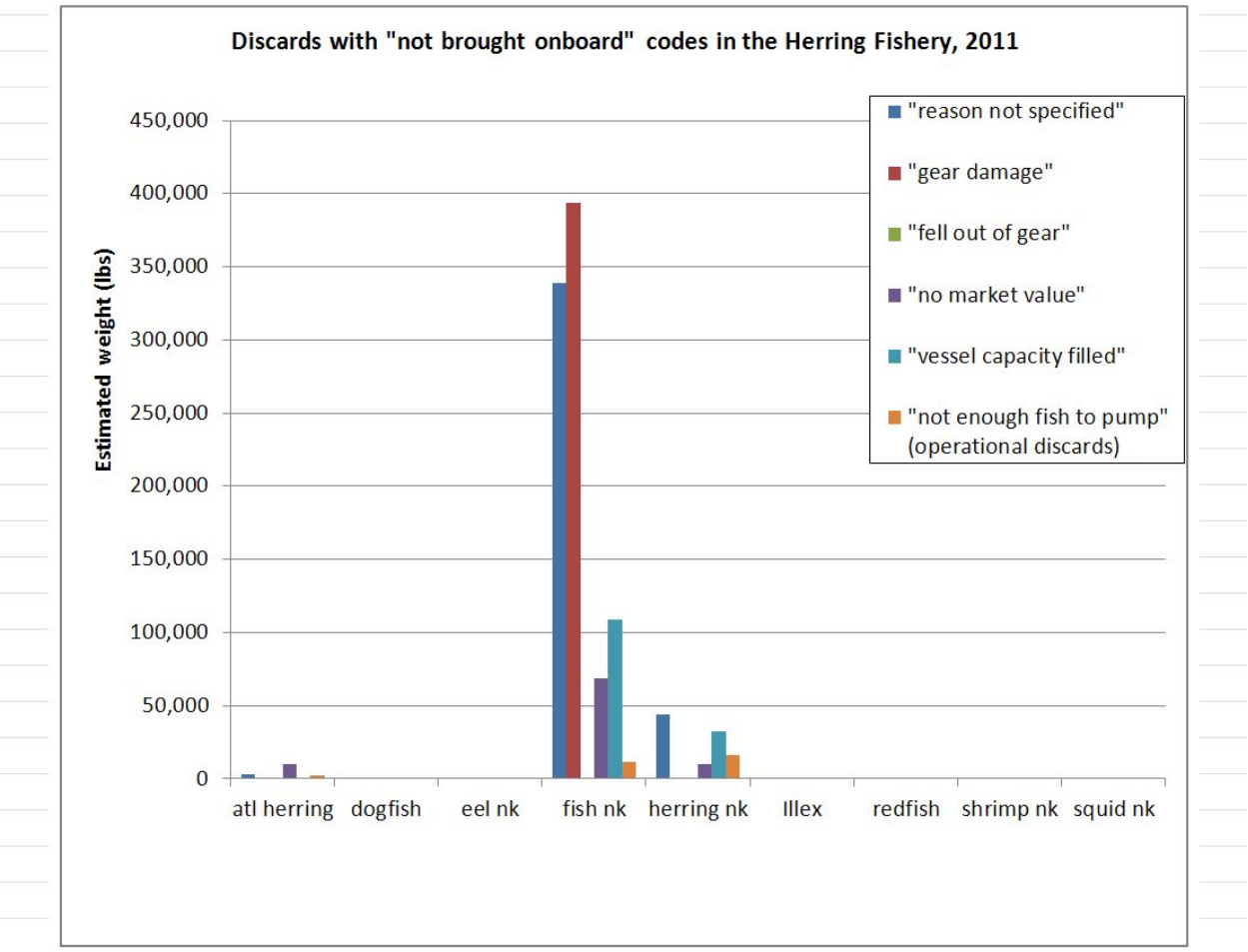
2011 Declared Herring Trips, all hauls from observed trips



BOT = Bottom Otter Trawl
PS = Purse Seine
SMW = Single Mid-Water Trawl
PMW = Paired Mid-Water Trawl

2011 Declared Herring Trips, all hauls from observed trips





total atlantic herring landed = 68,334,102 lbs