



## New England Fishery Management Council

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# MEETING SUMMARY HERRING PLAN DEVELOPMENT TEAM

May 23, 2016

The Herring Plan Development Team (PDT) met on May 26, 2016, at the Greater Atlantic Regional Fisheries Office (GARFO) in Gloucester, Massachusetts, primarily to discuss Amendment 8 to the Atlantic Herring Fishery Management Plan (FMP) and the Atlantic herring-Georges Bank haddock framework.

### ***MEETING ATTENDANCE:***

- *PDT members:* Dr. Rachel Feeney (Herring PDT Interim Chairman); Ms. Deirdre Boelke (Council staff); Mr. Daniel Luers, Mr. Brant McAfee, and Ms. Carrie Nordeen (NMFS GARFO staff); Dr. Jonathon Deroba, Ms. Sara Weeks (NEFSC staff); Ms. Renee Zobel (NHFG); Dr. Matthew Cieri (MEDMR); Mr. Micah Dean, (MADMF).
- *Others:* Mr. Peter Kendall (Herring Committee Chairman); Dr. Jamie Cournane (Council staff); Dr. John Manderson and Mr. Chris Sarro (NEFSC staff); Mr. Dean Szumylo and Dianne Stephan (HMS staff).
- *Audience:* About five attended in person and about four via conference call.

### ***KEY OUTCOMES***

- Reviewed outcomes of the public workshop on the Management Strategy Evaluation of Atlantic herring Acceptable Biological Catch control rules and developed recommendations for the Herring Committee.
- Developed analysis and recommendations regarding localized depletion.
- Discussed the Study Fleet program and potential use of the data in Atlantic herring management.
- Developed background information and alternatives for the Herring Committee to consider regarding the Atlantic herring-Georges Bank haddock framework adjustment.

### ***OPENING REMARKS AND AGENDA REVIEW***

Interim PDT Chairman Dr. Feeney opened the meeting at 9:30 AM and reviewed the purpose of the meeting. There were no changes to the agenda.

### ***AMENDMENT 8 – ACCEPTABLE BIOLOGICAL CATCH CONTROL RULE***

The PDT reviewed the outcomes of the May 16-17, 2016, public workshop: “Atlantic Herring Acceptable Biological Catch Control Rule Management Strategy Evaluation” (MSE). The workshop participants developed recommendations for objectives, performance metrics, and control rules to be evaluated in the simulation modeling that will occur this summer as part of the current MSE, as well as input on potential future MSE efforts and herring management generally.

The PDT noted the workshop outcomes relevant to the current MSE were fairly thorough, straightforward and well-developed, including a broad range of control rules. The PDT did not recommend any specific changes to the workshop outcomes for the Herring Committee to consider, but cautioned that it may not be possible to directly include some of the performance metrics. Some metrics may be used instead as proxies that address the intent of what was recommended at the workshop. An example is the metric to “maintain  $B_{MSY}$  at four times natural mortality ( $M$ ).”  $B_{MSY}$  has an absolute scale and natural mortality is a rate. The likely intent is to maintain biomass at some level that is greater than  $B_{MSY}$  (i.e., the  $B_{MSY}$  that would be produced by assuming four times  $M$ ). Another metric that could be a proxy is the frequency of years where biomass is less than some threshold.

The PDT noted the level of public interest in addressing localized depletion concerns, reiterating that the modeling tools to be used in the simulation work this summer are not advanced enough to simulate spatial dimensions, and that for Amendment 8, the Council is focused on considering control rules for the Atlantic herring ABC, which applies stock-wide. A control rule for within stock ACL setting could perhaps be considered in a future action.

The PDT noted that about 15-20 workshop evaluations were received; most had positive comments, though the evaluations will be summarized in the outcomes report.

*Public comment:* Ms. Erica Fuller (Earth Justice) asked if the Pacific Control rule was included in the workshop recommendations. Dr. Deroba indicated that, while not named specifically, various biomass cutoffs (where catch or fishing mortality rate declines to zero below a certain biomass level) as recommended, a key aspect of that rule.

### ***AMENDMENT 8 – LOCALIZED DEPLETION***

The PDT continued to develop analyses regarding localized depletion, in response to tasking by the Herring Committee on March 30. Topics included describing herring effort inshore and within specific 30-min squares, mapping herring effort, discussing Study Fleet habitat suitability modeling and use of Marine Recreational Information Program striped bass data, and describing tuna fishery catch per unit effort. At this point, the PDT is aiming to complete these tasks prior to the mid-August 2016 meeting of the Herring Committee. These tasks will be discussed at the July 28 PDT meeting. Drafts of all work should be submitted to Dr. Feeney by July 18 for compilation and consideration by the full PDT.

TASK: Marine Recreational Information Program striped bass data

The PDT considered the following task:

*The MRIP charter and private rental data include intercept site. Look at catch per trip for striped bass from private rental and charter intercept sites on Back side of Cape (0-3 mi from shore); compare to herring catches.*

The PDT felt that the general idea is to present the seasonal striped bass abundance off outer Cape Cod and compare that to herring removals from Area 521. For striped bass, the best proxy is from the recreational fishery data. Mr. Dean presented two draft figures of MRIP intercept data for Barnstable County, Massachusetts, for striped bass: seasonal landings and effort for the past ten years, and a calculation of catch per effort (CPUE). Striped bass catches and effort are highest right after the bass arrive in May and June, then slowly diminish through the summer, with a spike in November as the striped bass head south from the Gulf of Maine. CPUE, however, is fairly stable across the season. The PDT noted that the MRIP data are consistent with the known migration patterns of striped bass (from telemetry data). The PDT reiterated that striped bass are fairly opportunistic feeders, and it is difficult to draw conclusions about localized depletion from the data available.

The data presented were from all of Cape Cod (Barnstable County). To date, there has not been a straightforward way to select intercept sites from the back side of the Cape; the towns on the outer Cape are adjacent to Cape Cod Bay, Nantucket Sound, and/or the Atlantic Ocean. The PDT talked about the difficulty of correlating the port where a trip originated from with where striped bass fishing occurs at sea and relating that to herring fishing locations. The boat ramps are access points to go to many fishing locations.

*Follow-up:* Mr. Dean will lead the write-up on this task, including a summary of the telemetry information and overlaying the MRIP data with the herring effort data. In March, the PDT noted for the Committee that the herring fishery is primarily active to the east of the Cape before June and in the late fall.

TASK: Mapping herring effort

The PDT considered the following task:

*Make zoomed in heat maps of herring effort overlaid with: all current and proposed spatial regulations to better identify the importance of areas to the fishery and potential impacts of measures developed through Amendment 8, such as: groundfish closed areas (with 15 mi move along), distances 12, 30, 50 mi from shore, stat areas/30-min squares, herring management areas, bathymetry (100 fathom or 200 m depth), ASMFC spatial regulations (spawning closed areas), RH/S bycatch cap areas, and haddock AM areas.*

Dr. Lee has provided the herring fishery heat map data/files developed by the NEFSC Social Sciences Branch to Mr. Luers. He and Mr. Dean Szumylo (GARFO staff) presented to the PDT an interactive mapping tool, which could be posted shortly on the GARFO website. The PDT agreed that this would satisfy the Committee's task. Mr. Luers felt that the website would be ready to "go live" within a few weeks. The PDT made a few recommendations. For example, showing herring catches by month should include catches from the last five or so years of data (2010-2014). It is possible to map predator catches, which would go beyond the Committee's task, though many caveats would be needed to understand all the caveats; predator fishery

locations should not be confused as a measure of abundance given the numerous spatial restrictions, particularly in the groundfish fishery. Showing aggregate groundfish fishing locations, rather than species-specific, may be a better approach. However, the PDT decided to just develop herring fishery maps in the current work.

*Follow-up:* Mr. Luers will coordinate revisions to the mapping tool and have it posted to GARFO's website as soon as possible.

*TASK: Herring effort within specific 30-min squares*

The PDT considered the following task:

*Identify herring catch by season or month back to 2000 within the following 30-minute squares: 99, 100, 114, 115, and 123. Calculate the percent of the total Atlantic herring stock area that these 30-minute squares comprise.*

The PDT already completed the last sentence of the January task (see March memo to Committee). Dr. Lee is leading this task, but was unable to attend the meeting. It was noted that this task is fairly straightforward and that his work is progressing.

*Follow-up:* Dr. Feeney will check-in with Dr. Lee.

*TASK: Tuna fishery catch per unit effort*

The PDT considered the following task:

*Describe catch per unit effort in the tuna fishery over time.*

Mr. McAfee reported that he has been collaborating with the Highly Migratory Species (HMS) office at GARFO. The HMS staff recommends providing tuna dealer data from 2005-2015. The dealer data includes tuna landings by fairly broad areas (seven from Maine to Cape Hatteras) and landing port. A CPUE calculation is not possible at this time, because the effort data is insufficient. Dealer transactions could be a proxy for trips, but that is problematic, because the trips with no landings are not recorded. There is no data on tuna trips that have no tuna landings. It is well-known that there are many trips with no landings in this fishery. Also, the landings are sensitive to the bag limit, which varies over time. The PDT felt uncomfortable with using dealer transactions as a proxy for effort. However, the PDT can use the dealer data to provide information on landings locations and trends over time by the broad areas. Generally, tuna landings have been increasing since 2005 in all those areas.

Harvester catch reports would be useful in estimating effort, however, there are gaps in the harvester-reported data. Vessels with HMS permits are not required to submit Vessel Trip Report (VTR; i.e., no harvester reporting requirement), unless they also fish with permits that require VTR reporting. Thus, there is some overlap between the VTR data and tuna trips, but it is a subset of the tuna trips. The PDT would need to investigate to better understand the degree of overlap. The PDT also recalled tuna fishermen at prior PDT meetings expressing caution about the quality of the harvester report data, particularly the catch location data, but the PDT wanted to learn more about the HMS data to see if catch by the broad areas can be provided.

The PDT talked about how the number of zero trips might be identified. The NEFSC observer program does not observe the tuna fishery, apart from an Essential Fishing Permit project. A small portion of the fishery is observed by the South Atlantic Fisheries Science Center pelagic observer program, longliners with a BAYES permit (i.e., no observer coverage for handgear fishermen). There is also a Large Pelagics Survey (LPS) that intercept recreational tuna fishermen at boat ramps that might have some helpful information.

Ms. Stephan (HMS) indicated that the LPS would be the best data for the recreational fishery. It is similar to the MRIP data for other recreational fisheries, and administered by NMFS Science and Technology office at Headquarters. The data include catch and effort information. Recreational anglers are also required to report to HMS (online or with paper catch cards) when they land a tuna. The only commercial vessels required to report trip data (and have a Vessel Monitoring System) are the pelagic longliners (with log books). Purse seine vessels must also have VMS. Since 2015, the handgear fishermen are required to report catch (landings and discards), but there is no requirement to report trips with no catch.

*Follow-up:* Mr. McAfee will lead this task and collaborate with the HMS staff. Though providing CPUE data may not be possible. The dealer data can be used to describe trends in landings by season (2005-2015), dealer-reported broad area of catch and landing port – within data confidentiality restrictions. The PDT will look into the degree of overlap between the VTR trips and dealer reports to see if zero trips can be identified, as well as the LPS data for the recreational fishery.

*Public Comment:* Gregg Wells (Pew Charitable Trusts) noted that the Northeast Regional Ocean Council website reports some tuna catch locations.

The PDT indicated that it could see what data source was used.

## ***STUDY FLEET PROGRAM***

### *Program overview, infrastructure, and herring vessel participation*

Mr. Chris Sarro (NEFSC) presented an overview of the Study Fleet Program and the herring fishery participation in particular. The Study Fleet program began in 2002, but the fully-functioning electronic logbook program began in 2010 with tow by tow data using the FLNDRS system (though some vessels are still reporting at the sub-trip level). The herring vessel participation started with a few small-mesh bottom trawl vessels in Area 2. Then in 2013, funds from the Pacific States Marine Fisheries Commission helped expand participation to include herring midwater, pair trawl vessels. In all, eight vessels participated in 2013 and 14 in 2014, but participation has declined a bit since. Most vessels are reporting tow by tow information. Most of the herring trips have been in Area 2, but in 2015 there is a fairly good amount of data in Area 3. Providing data at the 10-minute square level is the finest scale possible without breaching confidentiality restrictions. Vessels that use the FLNDRS system are not sampled portside by MADMF or MEDMR (apart from a few to compare data streams).

A PDT member wondered if the Study Fleet data could be used for setting river herring/shad bycatch caps in future specifications, since there may be Study Fleet trips that are not observed or sampled portside. Mr. Sarro cautioned that participation may decline if the data is used for bycatch monitoring.

### *Use of the data in research and modeling*

Dr. John Manderson (NEFSC) presented on some of the uses of the Study Fleet data in Atlantic mackerel and squid habitat research, modeling as well as fisheries management. Generally, he is working on understanding the physical forces that affect fish population habitat. Fish metabolic processes are affected by water properties, like temperature and oxygen, which have spatial and temporal variation. A number of tools in the Mid-Atlantic are contributing to improved ocean modeling including satellites, radar, gliders, and buoys. The mechanistic models are well-informed by the real-time data. Investigators are trying to relate that oceanographic data to the fisheries data (e.g., trawl surveys). The Study Fleet data is helping fill in data gaps to build fine scale habitat models (NMFS trawl surveys are seasonal snapshots that do not survey inshore or the shelf-brake well) – providing daily snapshots of where the squid and mackerel fleets are. These data contribute to the thermal habitat models for these species. The interpretation of the fleet location is complex (e.g., weather, area management, global economics). Each participating vessel is given a model product that includes their data.

This past winter, for example, there was no mackerel fishing until a storm in mid-January caused a cold snap that mixed water over Nantucket Shoals to allow the cold water corridor from the Gulf of Maine to form and move mackerel down to the Mid-Atlantic for the fishermen to access for a short time period. The mackerel model helped identify and understand this event.

On a fine-scale, individual Study Fleet vessels have collaborated on experiments to, for example, understand movements of water fronts and their impacts on fishery catch and bycatch. There is a lot of dialogue with participants on their knowledge of the ecosystem.

At the NEFSC, there is a Climate, Ecosystem, Habitat, and Assessment steering group that has convened a working group to integrate climate, ecosystem, and habitat considerations into the 2017 stock assessment for Atlantic mackerel. The working group met last fall supported by NEFSC COOP research and the Mid-Atlantic Fisheries Management Council. The group recommended developing methods to understand and measure the effects of changing habitat dynamics with climate change on the availability of the mackerel population to fishery independent surveys, and to understand and measure how changing habitat dynamics with climate change and management regulations are determining availability of mackerel to the fishery. The work Dr. Manderson presented to the PDT stemmed from those recommendations, fully developing the models and field evaluations with the fishery to address those two issues before the 2017 assessment.

Dr. Manderson also spoke to butterfish work was funded by NEFSC COOP research, NOAA Office of S&T beginning in late 2011. The work was completed by 2015 when the quota from the last benchmark assessment (Spring 2014) was operationalized in regulations. That work also involved a large group of collaborating researchers including the Study Fleet. It was thought that bycatch in the small mesh trawl fleet fishing for squid offshore was causing significant mortality in the butterfish population, but through Study Fleet field work and interactions, it was realized that changing thermal habitat dynamics and the timing of inshore-offshore migrations with climate change could be producing survey observation errors affecting the assessment. Therefore, a dynamic habitat model was developed to estimate the proportion of available thermal habitat suitability surveyed that can be substituted for population availability to surveys in assessment catchability estimates. This work was a precursor to the approach being further developed in the current mackerel work that nests a continuous full blown cooperative research apparatus within multi-disciplinary, multi-institutional working groups addressing ecosystem-

based assessment and specific research issues that need addressing for assessments on a case-by-case basis. The collaborators will soon be exploring the addition of other variables to the habitat models such as current flow, as habitat is not defined just by temperature.

Dr. Manderson reiterated that the habitat models describe probabilities of occupancy in space and time given the accuracy of the information, the space-time scales at which it was acquired and the space time scales of the projections which are a function of the biological data used to inform them and the resolution of the ocean models and other habitat data you are using to project them. They do not predict absolute concentrations of animals (population size/habitat volume). In the ocean, the habitat volumes are changing shape, volume and geographic position even for demersal species and particularly when climate changes are affecting the properties of the ocean liquid.

It is possible to determine the timing and volumes of habitat overlap between species at some resolution determined again by the data informing them and the models used to project them. For high resolution, high resolution data are needed describing habitat partitioning amongst species. Studying fine scales of habitat partitioning are possible by working with the Study Fleet in a way that is really not possible with offshore research cruises that would require a tremendous amount of funding.

A PDT member noted that species vary in terms of how important bottom temperature is to their distribution. This work has been pioneered for mackerel, and it was asked how well temperature would predict habitat suitability for Atlantic herring, river herring, and others relative to other factors. Data storage tags and other methods have recorded selection of various temperature environments to meet other biological goals (feeding, reproduction). In developing bycatch caps, it would be helpful to predict the spatial extent of the species. Dr. Manderson clarified that since most animals are cold blooded, they are fairly responsive to temperature in setting the metabolic rates (apart from mammals), and that the models are for nowcasting and hindcasting, though the data do not go back very far.

### ***AMENDMENT 8 – LOCALIZED DEPLETION (CONT.)***

#### **TASK: Study Fleet habitat suitability model**

The PDT considered the following task:

*Determine if the Study Fleet habitat suitability model could be useful to understanding localized depletion.*

The PDT discussed the following with Dr. Manderson:

- The habitat suitability models have not been developed for herring or its predators.
- The oceanographic model that the mackerel model is built on is now being expanded to the Scotian Shelf.
- The model for each species is different and would take some effort and funding to develop.

The PDT concluded, and Dr. Manderson concurred, that a Study Fleet-informed temperature habitat suitability model may be useful to understand the distribution of herring (or their predators) in the future, predicting where fish are likely to occur. However, such modeling tools

are not developed at this time to aid the development of Amendment 8. Further, a habitat suitability model is not informative for localized depletion, as it is unable to measure a response in a population to removals; it only predicts where fish are likely to occur given a habitat model (temperature). This approach could inform bycatch monitoring/avoidance.

*TASK: Evaluate herring effort inshore*

The PDT considered the following task:

*Within the 6 and 12 nm territorial sea lines, identify herring catch as well as areas (e.g., Ipswich Bay, Nantucket Shoals) where herring fishing seasonally intensifies.*

*a. Determine and compare midwater trawl trip catches over time in each area, considering variation in tow-specific catches (accounting for tow time, number of tows, and trip duration).*

*b. Determine if, over the time of intensified fishing, catches could only be maintained by longer tows, more tows and/or longer trips, thereby indicating local depletion (e.g.,  $F$  much higher than  $F$  set for entire stock).*

Dr. Lee, Mr. Dean, and Dr. Cieri are leading this task. The PDT noted that the Study Fleet data for tows within 6 miles from shore is very limited. With Dr. Lee's absence, the PDT only briefly discussed this tasking.

*Follow-up:* Dr. Lee, Mr. Dean, and Dr. Cieri will continue to lead this task.

***ATLANTIC HERRING – GEORGES BANK HADDOCK ACTION***

Ms. Boelke reviewed the recent Council decisions to initiate a framework to consider amending the Georges Bank (GB) haddock cap and associated accountability measures. The PDR reviewed the draft action plan. One question came up about which PDT and Committee will be taking the lead on this action (Herring or Groundfish). Staff explained that right now, the specific vehicle for this action is uncertain; the issue may be a separate joint framework, or it may get folded in the annual Groundfish framework setting FY2017 specifications. Timing for Council final action would vary based on the action selected, but the target implementation date is the same regardless of the specific action, May 2017. Staff also clarified that to date this action is limited to GB haddock, and does not include GOM haddock. The PDT did not have any comments or suggested revisions for the draft action plan.

The PDT reviewed a draft discussion document summarizing some background information and a draft range of alternatives. The alternatives have either been discussed at recent meetings, or staff has developed them to further round out the range of potential alternatives. The first set of alternatives is related to the haddock catch cap; four separate alternatives were presented. One PDT member commented that additional rationale from the Council and Committee would help identify what the alternatives should be and what data should be used to develop them. It was explained that we do not want to have a disconnect between the alternatives and the problem they are trying to address. Another commented that in the future haddock abundance may decrease and a higher allocation to the herring fishery would have greater impacts on the groundfish fishery.

This led to a discussion of an additional alternative that would consider a percentage allocation that would vary somehow based on haddock abundance. The PDT did not get into the details of that alternative during the meeting, but a placeholder will be included for the Committee to consider that would have a variable or scaling percent allocation based on haddock abundance. A few concerns were raised about the alternative that includes a transfer in terms of administrative burden and risk. Another commented that the transfer option could be separated from the allocation decision. Finally, it was pointed out that the alternative that would suspend the sub-ACL would be reviewed annually when the groundfish PDT reviews annual catch of GB haddock. If catch increases, it is possible that a sub-ACL could be implemented again. For example, the GF PDT estimates the catch of GB haddock from all fisheries, and it may be useful to see what those estimates have been in other fisheries for comparison, has catch increased, etc.

Next, the PDT reviewed the alternatives drafted related to the accountability measure itself. No Action is an in season closure for directed midwater trawl gear in most of Area 3 and some of Area 1B, and two other alternatives were drafted to modify the area and/or season of the AM. The PDT discussed that a modification would likely be based on where commercial haddock fishing is taking place (using updated fishing years), herring abundance based on updated survey information, and/or areas with highest bycatch rates (based on observer data from 2010-2015). Dr. Jamie Courneane on the GF PDT plans to update previous analyses of haddock bycatch in the herring fishery to help identify modified AM areas and/or seasons. The Herring PDT gave her input on several questions she had before analyses were updated. One PDT member cautioned that it may be more practical to use statistical area boundaries for new AM areas based on how the catch data is reported.

Finally, the PDT reviewed the last set of alternatives related to the implementation of accountability measures. Eight separate draft ideas were developed and presented. The PDT recommended that one be eliminated from the list, amend how estimated catch is calculated in the herring fishery to observed catch only. In addition, the PDT discussed an alternative that would incorporate dockside monitoring, but the Council has already requested NMFS consider whether that is feasible and whether it would improve bycatch estimates. That work is under review and the Council will likely not hear back before the June Council meeting. It was also pointed out that there is a peer review of in-season bycatch estimation methods this fall, but that will likely be too late for this action. Finally, it was suggested that the document clarify that in some cases several alternatives can be selected in each section.

*Public comment:* Ms. Erica Fuller suggested that a bycatch avoidance program be considered on the list, since it would also meet the stated goals of the action. Staff responded that other plans such as the Scallop FMP have listed bycatch avoidance programs as proactive AMs, that potentially held reduce bycatch. It was noted that it can be problematic to require participation in an avoidance program. However, the PDT agreed that a section could be added for further consideration by the Committee.

#### ***OTHER BUSINESS, PLAN NEXT MEETING, ADJOURN***

##### ***Electronic Monitoring Program Pilot Project***

Mr. Luers briefly updated the PDT on the status of GARFO's electronic monitoring pilot project for the herring fishery. GARFO has received \$406,000 for the project and a Request for Proposals was published on May 5 to May 31 to identify a contractor to conduct the project.

Only small businesses may apply. GARFO expects to award the contract in mid-June. The contractor will develop vessel monitoring plans and install 3-6 cameras on all midwater trawl vessels (about 12) for a year. For the study, 100% of the haulback video data will be reviewed. The project goal is to get the fleet familiar with the camera gear, to determine if and how discards can be monitored, and improve cost estimates – all to inform the Industry-Funded Monitoring Amendment. After the project, the contractor will remove the cameras and plug any holes that were drilled in the vessel during installation. If this project aligns with IFM implementation, perhaps the cameras could stay on the vessels. The project will be complete in the fall of 2017.

*Public comment:* Mr. Wells asked for clarification on the timing of Council decisions on the IFM Amendment relative to the project; it seems like decisions will be made ahead of having information from the project.

Mr. Luers indicated that the final rule for the amendment may be published before the project is complete. There will likely be a grace period for implementation of the amendment.

The next full-day in-person meeting PDT meeting will be On July 28. The meeting adjourned at 5:13 pm.