



## New England Fishery Management Council

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### MEETING SUMMARY

#### Research Steering Committee

Hilton Garden Inn, Boston, MA

January 17, 2018

The Research Steering Committee (RSC) met on January 17, 2018 in Boston, MA to discuss: potential improvements to the NEFMC research priority setting process, updates on implementing program review recommendations for the Northeast Fisheries Science Center's (NEFSC) Northeast Cooperative Research Program, and recently completed research projects.

**MEETING ATTENDANCE:** Mark Alexander (Chairman), Bill Gerencer, Jeff Kaelin, Richard McBride (via webinar), Chris McGuire, Matt McKenzie, Peter Moore, Mike Pol, Graham Sherwood, and Mary Beth Tooley. The RSC was supported by NEFMC staff: Rachel Feeney (RSC Coordinator), Jonathon Peros and Sam Asci (Scallop Plan Coordinator and staff, via webinar), and Deirdre Boelke (Herring Plan Coordinator, via webinar). Six others attended in person, including NEFSC staff and participants of the research projects discussed. About five others attended via webinar.

#### KEY OUTCOMES

- Several recommendations for improving how the Council sets its research priorities.
- Discussion of three research projects and made recommendations on the use of outcomes.

#### SUPPORTING DOCUMENTATION

1. Meeting cover memo
2. Meeting agenda
3. RSC meeting summary, July 19, 2017
4. Research Priorities: staff memo re the research priority setting process, January 2, 2018; NEFMC *Research Priorities and Data Needs for 2017-2021*; presentation slides
5. NEFSC/Northeast Cooperative Research Program: *Northeast Cooperative Research Program Review, Northeast Fisheries Science Center Summary and Response*, March 2017; presentation slides
6. Management reviews: RSC-related excerpts of the Council's *Operations Handbook*; RSC management review worksheet; staff memo re peer-reviewed publications, Jan. 2, 2018
7. Project: *Seasonal Scallop Bycatch Survey*: 2013 Scallop RSA project final report, *Seasonal Bycatch Survey of the Georges Bank Scallop Fishery*, May 2015; technical evaluation; 2015 Scallop RSA project final report, *Optimizing the Georges Bank Scallop Fishery by Maximizing Meat Yield and Minimizing Bycatch* revised October 2017; technical evaluation and PI response, October 11, 2017; presentation slides; RSC meeting summary, June 25, 2012; RSC meeting summary, April 8, 2015

8. Project: *River Herring Bycatch Avoidance*: 2014 Herring RSA project final report, December 31, 2016; technical evaluation, April 19, 2017; PI response to technical evaluation, September 22, 2017; presentation slides
9. Project: *Effects of Fishing on Herring Aggregations*; 2008 Herring RSA project final report, May 31, 2011; technical evaluation, October 2011; presentation slides
10. Correspondence

### ***INTRODUCTION AND AGENDA REVIEW***

Chairman Mark Alexander began the meeting at 9:10 a.m. There were no agenda changes.

### ***COUNCIL RESEARCH PRIORITIES AND DATA NEEDS***

The RSC developed recommendations for improving the process for setting NEFMC research priorities and data needs, including how these priorities are documented. Dr. Feeney gave an overview of how other Regional Fishery Management Councils set their five-year research priorities and NEFMC staff input. The Councils vary greatly in the amount of effort dedicated to creating and updating lists. The NPFMC seems to dedicate the most effort, with an online database updated annually. No matter the degree of effort, a common theme is that there has been little feedback from the National Marine Fisheries Service (NMFS) about what happens with Council research priorities once submitted and how the priorities are getting addressed.

NEFMC staff feels it would help to know more about the end use of the priorities. How would greater effort in priority setting help get research accomplished? To that end, the Executive Director has requested that NMFS clarify the end use of the priority lists submitted by the Councils. Staff note that there exists several processes creating lists of research needs (e.g., assessments, RSA, action, 5-year); efficiencies could be realized. A master list with regular updates may be helpful. Including rationales (e.g., potential management use) would improve communication and ensure the list is focused on research questions. Documenting a process in the *Operations Handbook* would not hurt, unless too prescriptive. However, the *Handbook* should reflect reality (it currently states that a purpose of the RSC is to annual identify and prioritize research needs, which is not happening). Staff feel that there should be more concerted efforts to seek feedback on if and how research needs are being met.

### ***RSC discussion***

Chairman Alexander asked what should be included in research priorities (e.g., rationale), how often priorities should be revisited, and how updates can be made more efficiently; he states that it is difficult to know NMFS's needs for these priorities. Ms. Tooley liked the NPFMC approach, particularly including a rationale and status of the priority and using a spreadsheet to track the priorities; these may help in accomplishing priorities. Mr. McGuire asked and staff clarified that other Councils do not have RSCs, and the SSC has a key role in priority setting, though our SSC's plate is pretty full already. He favored the MAFMC process and document, because it was fairly simple to use. Staff noted that this past cycle, the SSC reviewed the priorities and made several comments that impacted the final list. The SSC wished for more rationale and felt that cross-cutting priorities should be better highlighted. Mr. Kaelin supported the spreadsheet idea; priorities should be organized not just by species but broad categories, and that the Northeast Regional Coordinating Committee should be involved in seeking feedback from NMFS. Dr. Pol felt that the RSC could be involved in ensuring priorities are being addressed. Dr. Sherwood noted that it is clear how Council priorities feed into the RSA program, but it is less obvious how they are used in other cases. Mr. Gerencer encouraged the Council to focus on what is needed for decision-making, where the lack of information has hindered management. Ms. Tooley discouraged use of "low" to describe a priority. Mr. McGuire suggested that the NEFMC and

NEFSC priorities be included in a master document. Mr. Moore added that the ASMFC priorities would be important for a global document. Mr. McGuire felt that noting completed projects would help identify what has been done. He hopes that proposal reviewers are looking at regional priorities in gauging the importance of a project; several RSC members supported having national funding programs better linked to regional priorities.

Public comment

Mr. Smolowitz (Coonamessett Farm Foundation): Council ranking and prioritization is unhelpful; researchers know the needs. A RSC process should identify broad needs and funding sources. He gave a few examples of data gaps (cold pool in the Mid-Atlantic, what is feeding the burgeoning seal population, fisheries development). There is a lot of funding going to well-connected people to do unnecessary research (e.g., NOAA's research funding on microplastics). During a management review, the RSC should discuss what was learned from a project, like ongoing research needs and how they may be addressed.

RSC discussion cont.

Chairman Alexander encouraged the RSC to talk about its role in the priority-setting process. Dr. Pol recalled that the Council's charge to the RSC to review priorities predates the Federal mandate; he wondered if the RSC has sufficient expertise and did not want to duplicate efforts. Ms. Tooley noted that the RSC and SSC have very different make-ups. Staff noted that when the RSC last reviewed research priorities (March 2017), the discussion focused on process rather than content. Dr. Sherwood felt that needs should get characterized rather than ranked. Some noted that much of the RSC's time has been spent on reviewing reports rather than steering, but perhaps its future could be different than its past.

**Consensus Statement #1:** The RSC recommends that for Council research priorities:

- *Format:* Use a spreadsheet rather than a Word document. However, a searchable database would be ideal.
- *Content for each priority should include:* A description/rationale, priority code, what other priority lists it is included on (e.g., assessment, RSA), all categories that the topic addresses (e.g., species, broad category), research status (e.g., not begun, underway, completed).
- *Coding:* Rather than "low/medium/high," uses codes such as, "near-term," "critical," "long-term/strategic," "urgent/immediate", and "value-oriented".
- *What to include:* Keep the list focused on the Council's needs. Once a project is completed, it should not be removed, but the research status updated and the entry amended to note/link where information may be accessed.
- *Outreach:* There should be more concerted outreach to national research funding programs, and a suggestion made that they should require proposals to indicate if and how the research would meet an identified Council priority or reward proposals that address Council priorities.
- *Process:* The Plan Development Teams should continue to have the lead in developing and updating research needs. RSC review should continue to be a step in updating the list. The RSC should be more involved in tracking if and how needs are being met.

## ***NORTHEAST FISHERIES SCIENCE CENTER/NORTHEAST COOPERATIVE RESEARCH PROGRAM***

Dr. John Hoey (NEFSC/Cooperative Research Branch (CRB) Deputy Director) updated the RSC on implementing the recommendations of the program review. He welcomed input on:

*Integrating cooperative research across the NEFSC:* He noted some staffing moves and hiring within the Fisheries Monitoring and Research Division. The NEFSC has created cross-division working groups to better use resources and strengths, identify data gaps, and integrate cooperative research to improve assessments (e.g., existing mackerel working group with industry, new fluke working group). CRB ran a “speed talk” series that enhanced NEFSC-wide understanding of program capabilities and sought additional collaboration across divisions and branches. CRB also participated in the recent groundfish assessment update port meetings.

*Survey trawl catchability studies:* He gave a brief history on all the survey catchability studies that have occurred since 2009 (e.g., rock hopper vs. chain sweep, paired vessels) and ongoing collaborations with the Northeast Trawl Advisory Panel (met January 16, 2018) to plan research.

*Longline survey and uses of its data:* 2018 is the fifth year of the longline survey, improving data on species not captured well in the trawl survey or have limited data (e.g., cusk, halibut, wolffish). Work is ongoing on the effects of bait plume and tide direction and strength on catch rates. Assessments are using data (cusk, thorny skate).

*Study Fleet:* Study Fleet software is being used at the trip and sub-trip levels, constituting 83% of all eVTRs submitted (120 vessels). He reported on a few projects that are advancing electronic technologies: the Gulf of Maine Research Institute is partnering with CRB to enhance the performance of FLDRS software for fixed gears, and Cornell University is partnering on automating portside data transmission and including more whiting vessels. NCRP is working with the observer program to see how self-reported logbook data and observer data align to better understand the proportion of tows that would need to be reviewed under an EM audit review of electronic reporting to generate acceptable confidence intervals for discards.

### **RSC discussion**

Mr. McGuire noted the NCRP program review recommendation to better incorporate Study Fleet and long line survey data into assessments and suggested that researchers submit working papers to the peer review as a proactive step, rather than hoping that the data are used. Dr. Hoey noted that the Population Dynamics team has been a close collaborator all along. Once the data quality and structure system is set, it will be easier to integrate the results. The size selectivity data will be really helpful, as well as the age and growth data for cusk. Mr. Lipsky noted that the work on the mackerel assessment was with the assessment scientists; it takes a few years to scope it out, and develop the data. The fluke benchmark assessment will have a number of cooperative research data sources. Have the assessment schedule several years in advance would help.

Mr. Alexander noted that the majority of Study Fleet species data is on yellowtail flounder and asked if there is complementary GPS and temperature data and if the data can be used for scallop bycatch avoidance. Dr. Hoey clarified that there is good GPS/temperature data, particularly from the one fishermen doing the majority of tows; it is possible to get good effort data from Study Fleet, though perhaps the time series is still not long enough. Specific species thermal preferences can be studied and those preferences can inform bycatch avoidance when bottom temperature forecasts are available. Study Fleet vessels are not very involved in the scallop fishery; the data might not be directly suited for bycatch management in that case.

Mr. McGuire asked how the NCRP sets priorities and how it may overlap with Council’s. Dr. Hoey clarified that the NEFMC, MAFMC, ASMFC and benchmark assessment priorities are on his desk. It is very important to identify and fund common needs. Annual funding has reflected

Council priorities. Recently, NCRP has focused on what are the most appropriate research themes for cooperative research: complementary surveys, filling data gaps, improving FDD data and network approaches to solving fishing gear issues. Mr. Lipsky noted that the NEFSC has an annual research prioritization process that NCRP priorities fit within, but the Northeast Regional Coordinating Committee (NRCC) is also consulted.

Mr. Kaelin asked if Study Fleet can help with survey catchability estimates; it was disappointing that the witch flounder estimates were not improved by the *F/V Karen Elizabeth* work. Will there be sufficient work on fluke catches to help with catchability for the assessment? Dr. Hoey explained that the catchability work is separate and distinct from Study Fleet records, since the studies referenced were not fishery dependent but rather designed survey gear studies. He noted that discussions have started, including both survey gear tasks as well as evaluation of self-reported catch data; but the fluke data meeting is in August, so they largely have to work with existing data. Mr. Lipsky noted that the Trawl Advisory Panel is giving catchability input.

Ms. Tooley said that it is good to hear that the Council priorities are being used and that there is a process to work with the NRCC, though there needs to be better communication between the Council and NRCC. Dr. Hoey noted that, in terms of responding to changing priorities, cooperative research is not an on/off switch; it takes us time to develop and adapt to new surveys (transitions, staffing), so five-year planning for benchmarks would be helpful, and the working groups should help plan teams directly.

The RSC developed no consensus statements.

#### ***MANAGEMENT REVIEW OF FINAL RESEARCH REPORTS***

Chairman Alexander noted that each of the following projects were funded by a Research-Set-Aside (RSA) program, and a RSA program review will occur later this year. He encouraged comments that may help the program review, in addition to specific comments about the projects; it is an opportunity for the RSC to do some steering. He thanked RSC members for submitting written comments in advance (compiled at the end of this meeting summary).

##### ***Project: Seasonal scallop bycatch survey***

Ron Smolowitz, Dr. Liese Siemann, and Luisa Garcia summarized the project, led by Coonamessett Farm Foundation. A seasonal bycatch survey has been funded through the Scallop Research-Set-Aside (RSA) program since 2011, and the RSC has reviewed the project in June 2012 and in April 2015. Chairman Alexander asked the RSC to focus on the Scallop PDT request for input on the utility of this survey as a time series and the potential for using data on a range of species, data that is not otherwise collected by the federal observer program (e.g., spawning condition of flatfish). The survey has aimed to quantify groundfish bycatch relative to scallop meat yield with the goal of optimizing scallop harvest while minimizing impacts to other stocks, conduct gear research for bycatch reduction, and conduct biological sampling. The survey has been modified and adapted overtime to address current management concerns, as recommended by reviewers and the Scallop PDT. From 2010 until 2014, survey stations were in the scallop access areas in Closed Areas I and II (CAII). Stations were then moved to northern Georges Bank, including the northern half of CAII (not currently open for the scallop fishery).

Mr. Kaelin asked about the hanging ratios used, if the number of twine top rows has been shortened, and if there would be value in a proactive AM to help the meshes open up more. Dr. Siemann clarified that all of the work has been done with a 5- or 7-row apron (the rings); the twine top ratios have not changed (1.5). Mr. Smolowitz recalled early studies (1999-2003) testing twine top hanging ratios; there were problems with a ratio of 1; 1.5 worked best. A 7-row maximum apron is now required. The 5-row apron is an AM measure. Management of twine top

and aprons need to be linked to avoid manipulation. We have not tested 7 ring, 2:1, though there is interest in it. It is difficult to test for bycatch reduction when there is so little flatfish catch in the control dredge, letting out 95% of the flatfish in its path. Having a cover to retain escapees will help. Mr. Kaelin asked about twine top research to reduce lobster damage. The team noted that there is some lobster data that has not been analyzed, but the low-profile dredge may be the answer. Extended links are look good for letting out juvenile monkfish.

Mr. McGuire asked if HabCam would be deployed to enhance survey utility. Dr. Siemann said that they are trying to schedule HabCam tows simultaneous to the bycatch survey, but boat schedules may impact timing. Mr. Smolowitz thought HabCam would be good for looking at predator-prey interactions and seasonal aspects to habitat that should be understood. A seasonal HabCam survey is pricey. It is a tool for noting presence and potentially correlations.

Mr. Kaelin asked if there is a water temperature time series. Dr. Siemann clarified that there is, with analysis coming out in May. The survey is seeing yellowtail flounder mostly in southern CA2. Mr. Smolowitz got the Council to recommended research in the habitat closed areas, but that was not approved by NMFS. The survey is seeing a lot of scallop grey meats are on the border of the Habitat Areas of Particular Concern and hopes that they aren't becoming a reservoir for disease; they should be understood better. They are working with other institutions to combine temperature datasets for better use.

Discussion continued on their work on spawning, swept area biomass, Jonah crab data. Dr. McBride felt that it is important to prioritize field time, and spawning is pretty well documented, so encouraged identifying unanswered questions to address. He also noted that the NEFSC is monitoring the northward expansion of fluke, was concerned about redundancy, and wished for more specific objectives that have definable endpoints. Mr. Smolowitz felt that reproduction is a low-hanging fruit to study; there is little added cost. Dr. Siemann noted that the project has grown over time, because it is relatively easy to collect data.

Mr. Peros asked the RSC that since survey stations have changed over time, do they feel that using the data as a time series is appropriate. Ms. Tooley felt that the PDTs need comparable data year to year. Chairman Alexander felt that perhaps the RSC is not equipped to address very technical questions related to the statistical validity of station choices. Dr. Pol thought it is an odd request of the RSC. Mr. Smolowitz noted that the survey was not designed to be a survey, but has collected a lot of data that could be informative for many management questions, including those that have nothing to do with scallops.

The RSC developed the following consensus statement.

**Consensus Statement #2:** The RSC recommends that the reports and data from the *Seasonal Scallop Bycatch Survey* should continue to be used in management. If the project continues, it would be valuable to maintain the principles of a time series (i.e., compatibility year to year). Research on scallop bycatch is important and should continue as a high priority.

#### *Project: River herring bycatch avoidance*

Dr. Dave Bethoney and Brad Schondelmeier summarized the project, led by the University of Massachusetts and the Massachusetts Division of Marine Fisheries (MADMF). With funding from a variety of sources, portside sampling of the Atlantic herring and mackerel fisheries has been conducted by MADMF since 2008. The 2014 Herring RSA project, *River Herring Bycatch Avoidance*, was funded to help improve the accuracy and precision of incidental river herring (RH) catch estimates, to reduce bycatch through avoidance, and to test net sensors to help determine any associations between environmental conditions and RH herring bycatch. The

Herring Plan Development Team has used portside sampling data to help characterize river herring bycatch and develop bycatch caps for the 2013-2015 and 2016-2018 Atlantic herring specifications. The NMFS has been examining whether portside sampling data are comparable to that of federal fisheries observers for monitoring catch. The topic of portside sampling and bycatch avoidance remains a NEFMC research priority, and was recently identified as a priority for the 2018-2020 Herring RSA. Funding through the Herring RSA has been challenging because the RSA quota only becomes valuable after the fishery quota has been caught, so the project has been underfunded at times, though the industry has donated funds to sustain it.

Chairman Alexander asked the RSC to focus its management review on the bycatch avoidance network, use of net sensors, utility of the project for a task the NEFMC expects to complete in 2018: developing a white paper on the consideration of river herring and shad as stocks in the Atlantic herring fishery. Three RSC members recused themselves: Dr. Pol as a MADMF employee and Ms. Tooley and Mr. Kaelin as herring industry partners on the project.

Mr. Moore asked how the work has been incorporated into management and asked about future priorities. Would the work be helpful for the upcoming shad assessment? The PIs replied that the data was used to develop river herring catch caps (Framework 3), the project has given industry a tool to help remain within the bycatch caps, and they are working with GARFO on using it for monitoring catch caps within seven days. They work closely with MADMF biologists on using the data. Mr. Moore indicated that the Council has not used the RH genetic work in establishing buffer zone alternatives for Amendment 8. Ms. Tooley clarified that Amendment 8 is not focused on RH, though impacts on RH are being analyzed as usual. Dr. Bethoney clarified that the genetic work is data from 2012-13, mostly from Southern New England, and there is an ongoing project to expand that work with more recent data, methods, and areas, but the results will not be ready for a few years. Dr. McKenzie noted the public comments on the potential impacts of Amendment 8 on southern stocks of RH. Mr. Alexander asked if the portside data was used in the RH assessment. Mr. Schondelmeier clarified that the data was used. Mr. Kaelin said that the project has helped understand the potential cost of a shoreside monitoring program.

Dr. Sherwood recalled funding shortfalls in the early days of the Monkfish RSA program. The solution came through concerted efforts, though meetings with the NEFSC researchers and industry. Funding issues should be addressed for the future of the program. Dr. Bethoney said that some progress is being made, but it is still hard to harvest all of the RSA; there could be quota transfers between gears and areas, but that's not popular. Dr. Sherwood offered the solution for the Monkfish RSA, to go to two year projects. Dr. Bethoney has learned that it is important to get the experimental fishing permit as soon as possible and to do outreach to states.

**Consensus Statement #3:** The RSC recommends that the reports and data from the *River Herring Bycatch Avoidance* project should continue to be used in management. This project has produced high quality work; the bycatch avoidance program has reduced bycatch and should continue. This work, including all its publications, would be very helpful for developing the white paper on considering river herring and shad as stocks in the Atlantic herring fishery.

*Project: Effects of fishing on herring aggregations*

Dr. Michael Jech (NEFSC) summarized the project, led by Dr. Jason Stockwell (formerly of GMRI, now University of Vermont). In 2007, Amendment 1 to the Atlantic Herring Fishery Management Plan established the Herring RSA program. Through Amendment 1, a seasonal closure for midwater trawl gear was established in the Gulf of Maine (Area 1A). The rationale for this closure included that it may provide an opportunity for research to determine the impact of this gear type on local aggregations of the herring resource. In 2008, the first and only project

to be funded that year was titled, *Effects of Fishing on Herring Aggregations*. Although the project aimed to define localized depletion of herring and develop hydroacoustic techniques to estimate stock size and localized depletion, particularly by midwater trawling. However, funding limitations (71% of budget funded) required that the project focus solely on methods development - acoustic methods to study impact of fishing on herring aggregations. Field work was done in 2009; very limited test tows showed that there may be vessel effects on herring aggregations and more work would be needed to tease that from any gear-specific effects.

Chairman Alexander noted that localized depletion questions remain unanswered and is a NEFMC research priority, and a priority for the 2018-2020 Herring RSA. He asked the RSC to comment on the potential for using the methods developed in future research.

Dr. McKenzie asked about the rigor of any conclusions. Dr. Jech clarified that the results are not statistically defensible, and that more work would be needed. Dr. Pol asked what the anticipated scale of the catch was relative to the size of the schools. Dr. Jech clarified that the scaled back project did not look at the size of the school, but whether the school was disrupted. Mr. Alexander asked, given pace of technological advancements, would these methods be relevant still? Dr. Jech clarified that the acoustic technology has not evolved very much, and is pretty comparable to what the NEFSC uses now; the electronic components are evolving though. Broadband sonar is being used more. Mr. McGuire asked if there are other people trying this technique. Dr. Jech was not aware of that, but there has been a lot more work on vessel effects. Collecting acoustic data is not costly, but analyzing it is. To design a depletion study, there would need to be a biomass estimate, and estimating shallow schools is difficult.

Dr. Pol noted that the scallop fishery has become data-rich through its RSA; there is a fundamental inequity across RSA programs due to the inherent characteristics of the different fisheries. Mr. Alexander noted that Scallop RSA access is limited, which puts a premium on RSA pounds; herring does not become limited until RSA closes. Monkfish has not landed the TAC. Without multiyear awards and EFPs, that compensates that. Ms. Tooley commented that herring is not data poor for stock assessment, and highly abundant. Mr. Gerencer commented that several Scallop RSA projects are helping improve data for other species.

On improving methods for a future study, Dr. Pol suggested there be a before study, but wondered how to determine vessel effects. Dr. Jech explained that downward listening sounders can be placed on buoys (easier than upward listening), and then the vessels go by.

**Consensus Statement #4:** The RSC recommends that, due to low sample size, the results of the *Effects of Fishing on Herring Aggregations* project should not be directly used in management. However, valuable lessons have been learned from this study. Acoustic tools could be important for future studies of vessel effects and localized depletion, and used in conjunction with catch data to discriminate herring species.

## ***OTHER BUSINESS***

### ***Cox's Ledge Habitat Management Area***

Dr. McKenzie noted that Council member Terry Alexander will be asking the Council to develop a research priority to study the effect of raised ground cables and shortened or no sweeps to reduce swept area. Ms. Tooley noted that raised footropes have been researched extensively in the Bering Sea and is a regulatory measure for groundfish vessels there, and there is ongoing research in the Gulf of Alaska, but NMFS rejected the Cox's Ledge measure in the Omnibus Habitat Amendment due to insufficient local research. Dr. Pol noted that some work was done under the GEARNET project. Mr. Kaelin supported getting this research done.



### Bureau of Ocean Energy Management

Mr. McGuire highlighted that the Bureau of Ocean Energy Management has funding for research, with an annual process to accept ideas for research (closes in February). With increased discussion on the intersection of fisheries and offshore energy projects, there may be opportunities for the RSC to engage to help Council priorities be accomplished with that funding source. He asked that the RSC consider this at a future meeting.

The meeting adjourned at 5:35 pm.

### ***APPENDIX I – RSC WRITTEN MANAGEMENT REVIEWS OF COMPLETED RESEARCH***

In preparation for the January 17, 2018, Research Steering Committee meeting, RSC members were asked to prepare for the management review of research projects by considering in advance the 11 questions guiding a management review relative to the final reports to be discussed. Each RSC member was assigned one project to be a lead reviewer for, but was encouraged to prepare comments on additional projects too. This appendix to the meeting summary compiles all written comments received from individual RSC members. These comments should not be considered the consensus of the RSC. Duplicative comments have been removed.

#### Project: Seasonal scallop bycatch survey

*1) Has there been a sufficient technical review of the project results and, if so, is that information available to the Research Steering Committee?*

- Yes. One report had a detailed, and presumably NEFSC-supplied, technical review. It was short, but very positive. In addition, at least seven journal publications were derived from the two works reviewed.
- The review of an earlier draft of the project report seems to have been more bureaucratic (or process oriented (e.g., wording of the objectives has changed) than scientific. However, it pointed to ways to improve the clarity of the report (e.g., better figures), and the current version (Doc 7c) seems to have been improved in response.
- Technical reviews of both projects were available to members of the RSC. The 2013 project review was not in depth, relative to the data and models used to develop project results, although it did highlight the realization of the primary goal of the project – to maximize scallop meat yields while minimizing the bycatch, primarily of yellowtail flounder, in a temporal and spatial context – to the rotational management system (beginning with FW 24). The 2013 project review also highlighted an important secondary objective, to evaluate apron and twine top gear modifications to reduce flatfish bycatch. While not specifically stated, this work led directly to the reactive AM used to reduce the bycatch of southern New England windowpane flounder in the scallop fishery, by requiring a 5 row apron and a 1.5:1 hanging ratio west of 71° W after the SNE windowpane sub-ACL for the scallop fishery has been reached, for example.
- The 2015 project technical review was more detailed, in terms of making recommendations to clarify the scope and analysis of the data and applications of the models used to analyze it, along with the responses of the project leaders to those issues. This review, however, did not get into the value of the project results.
- The goals of both projects were directly addressed by the research but, unfortunately, there is little spatial continuity between the two projects. While I understand the importance of evaluating seasonal and spatial bycatch distributions in Northern CAII, given the potential for OHA2 to provide access there, it seems unfortunate that the stations monitored in the first study were not repeated in the second.

*2) Did the project accomplish all of its stated goals and objectives?*

- Yes, a very diverse range of project objectives were met.

*3) Are project deliverables available and formatted for use by the Council and its technical committees?*

- Both projects were executed by reputable scientists and used data collection and reporting formats that seem adequate for use by the PDT. There are a lot of data here. It will take further technical review to ensure that future surveys are able to take this data to produce comparable results and help to focus these surveys to continue to develop a valuable time series of information about the various investigations being pursued.
- The reports contain a large compilation of tables and figures of results. In addition, data from the two surveys have been supplied to the PDT for Council use.
- Yes. Project is summarized in a well written report with extensive figures and tables.
- Many samples were collected, but this final report has little synthesis. The Executive Summary does not list the major findings by objective, so it is difficult to follow. The effects are vaguely stated. The conclusions and recommendations mostly say that more work should continue.

*4) Does the project address an immediate management need or contribute to a long-term strategy to rebuild and sustain stocks?*

- Yes. All of the primary goals and objectives of both studies address important management questions and it is evident that these have matured over time, based on past experience. Continuing these surveys to reduce groundfish bycatch rates and allow fishing when scallops are at their peak is a challenging task and the data indicates that significant spatial and temporal overlap makes future management decisions around these variables very complicated. Each of the five objectives of the 2015 study should continue to guide future surveys in my view.
- The projects address many management needs. These include temporal and spatial distribution of: bycatch especially with regard to yellowtail and windowpane flounders, occurrence of gray meats in scallops, shell height / meat weigh relationships, disease in yellowtail flounder, and estimates scallop discard mortality and shucking loss. The studies also simultaneously conduct gear comparisons with the goal of reducing bycatch.
- Yes, this project provides information for reducing bycatch of yellowtail and other flatfish and results have been incorporated in Framework 24 to the Scallop FMP and Framework 49 to the multispecies FMP. This project also presents information on how to optimize scallop meat yield which can inform management strategies.

*5) Does the project support past work and/or provide new information?*

- Generally, yes. The fact that the conclusions from these studies do not completely identify the potential for additional management changes to enhance the efficiency of the fishery has less to do with the research than the fact that scallop management is continuously evolving. It is clear that this work has led to management changes to reduce turtle and finfish bycatch and better target peak meat production, for example. Additional progress can be expected to be made in these areas by continuing to target this work around likely areas for the fleets to fish, on an inter-annual basis, and in close coordination with the management process.
- The core project component (spatial & temporal bycatch) provides a short time series of data useful for seasonally managing bycatch of potential choke species. Various add-ons make efficient use of at-sea time to address other current management issues.

- Yes, this work was part of an ongoing gear testing and bycatch survey operating since 2010 and follows from a number of previous projects (NA10NMF4540473, NA11NMF4540027, NA12NMF4540034). This project extended existing grid survey from previous projects to improve data on seasonal fish movements.
- The analysis of shell height-weight relationships is interesting, but could use more attention. It would be helpful if the precision of meat weight and shell height measurements was stated, especially since there was some odd residuals in Appendix B. I also did not understand why 'NEFSC parameters' were used (p. 16) instead of newly updated parameters from this study (or, for that matter, to evaluate the improved fit between parameter sets). In general, the model used appears appropriate but the results are limited to stating whether an effect was observed or not, without any statement to effect size. It appears that the effect size of 'area' is small, the effect size of season is probably important (and likely the result of tradeoffs of energy going to gonad weight for spawning in the fall, but this is not conclusive because the PIs did not measure gonad weight). The effect of meat quality on meat weight is likely the biggest effect, but that is hardly surprising. A specific demonstration of how these results would actually help predict yield, either with greater accuracy or precision, is what I was looking for.

*6) Does it point to a management action not in place now, or offer an innovative solution to a problem?*

- It seems important to continue these surveys to better understand finfish bycatch distribution over time and space, particularly with a warming ocean. Repeatability and targeting areas currently closed but expected to reopened should be a priority. As mentioned above, additional work around bycatch reduction and twine top hanging ratios also seems important in the future as does continued evaluation of nematode and gray meat occurrences. Would future evaluations of bottom temperatures throughout these surveys also add to our understanding of these management issues?
- Bycatch data derived from these projects has been, and will likely continue to be used in management actions that address the low sub-ACLs for yellowtail and windowpane. The gear comparisons continue to test innovations in gear design to reduce bycatch.
- Yes, the authors concluded, and this reviewer agrees, that "this seasonal bycatch survey has generated an abundance of valuable information for improving bycatch reduction through gear design and mapping of seasonal fish distributions."

*7) Did the project elucidate other information not specifically stated in the goals and objectives?*

- Unclear. Since the goals and objectives of these projects were necessarily broad, it is not clear to me that other information, which was not anticipated, emerged from them.
- Yes. Information from this survey was presented to the Transboundary Resources Assessment Committee for incorporation into yellowtail stock assessment. However, their primary and secondary objectives were broad enough to incorporate the broad range of findings which includes new information on fish distribution, bycatch reduction, scallop biology (including meat yield), scallop disease, and gear modifications.

*8) Is there a need for further work or follow-on research such as wider field-testing?*

- This work should continue with the PDT and other technical experts continuing to refocus it annually.
- As the yellowtail and windowpane bycatch is a problem that will likely never go away, and as long as disease and parasites will continue to be an issue in the scallop fishery and for yellowtail flounder, this work should be repeated at regular intervals, either annually or bi-annually. With this in mind, effort should be directed toward refining the survey

design and statistical approach and strictly adhering to that design so as to strengthen the developing time series of data. For example, the “control dredge” should always be the same design. Contrary to a statement made in the second report (“Since 2010, at least one of the dredges used in the project has been a turtle deflector dredge (TDD) with a 7-row apron.”), the TDD described in the 2013 study had an 8-row apron.

- This work continued in a 2015 Scallop RSA award (NA15NMF4540059). There is value in continuing this work so that trends in bycatch spatial and temporal patterns, as well as scallop biology and health can be monitored and incorporated into future assessments.
- It is difficult to see the value of the data for objective 1, because no measures of precision are provided (e.g., 95% confidence limits). The data are discussed in terms of 'low' or 'extremely high' without any objective framework (e.g., low bycatch of yellowtail flounder could be bad since they are overfished with overfishing occurring). This work should not continue without evidence of the precision of this sampling approach.
- The biological sampling of fishes should probably not be continued. The authors seem unaware of the literature on methods and results of flatfish spawning, so it is difficult to evaluate what they did but the results don't appear particularly informative (i.e., we know when these three flatfish spawn based on macroscopic characters).
- The investigation of disease looks more interesting but I have reservations. I agree that there is a concerning prevalence of disease and that the sources are likely to be complicated or non-linear, but without collecting individual weights or ages of the fishes, I doubt that their current approach will be conclusive.

*9) Who is the appropriate end-user and are there recommendations/caveats about how this information should be used?*

- Clearly, this work has and will continue to focus management on temporal, spatial and gear-related variables and can be anticipated to continue to create efficiencies in the fishery, while minimizing negative environmental and ecosystem affects.
- This work has already reached the appropriate end-user which is the NEFMC, who can incorporate findings into FMPs (for scallops and groundfish).
- This work has also proven useful to the TRAC and has been presented to an impressive range of audiences at both national and international meetings (detailed on pg 37-38 of report).

*10) Overall rating based on the above criteria: excellent, very good, good, fair, or poor.*

- Good to excellent. Both projects are a solid foundation for future, related research.

*11) Additional comments.*

- The second report had good improvements in writing and organization.
- This project has produced a tremendous amount of information on alternative gear configurations in terms of target species catch and bycatch rates; spatial and temporal distributions of scallops and bycatch by gear configuration; prevalence of discolored scallop meats (grey and other shades) and its association with parasites; weight-length relationship by season and area, etc.
- While I have not evaluated the method in detail (e.g., sampling design, statistical analysis, parasitology, etc), the research appears to be rigorous and conducted by well qualified scientists. Undoubtedly, this is valuable information with potentially important applications to fishery management and industry decision making on use of the resource.
- Under a page of text on “Conclusions and Recommendations” does the study injustice. Essentially, it says (1) that the project continues to produce a wealth of information (presumably meaning that it should be continued) and (2) that studies of economic

impacts should be conducted. Why should the project be continued, and at what frequency (every year, or is every few years enough?) and intensity (how many samples per survey are necessary?). Clearly, the amount of interannual variability is a key consideration, which is partly a function of variability in bycatch species abundance. Can some of the inter-annual changes be predicted from indicators of bycatch abundance? With respect to 2, I agree, but at least a “first cut” analysis of the economic impact of a small reduction in scallop catch per unit effort and an increase the scallop catch per unit of bycatch of choke stock shouldn’t be difficult (I’d guess the PDT can do it). In addition to 1 and 2 in the Conclusions and Recommendations section of the report, I would have been pleased to see more analysis and recommendations on opportunities to use information from the study to advance management and fishery performance.

- Now that we know that access to this area has not been agreed to, it would seem appropriate for additional surveys to repeat an analysis of the earlier areas surveyed and focus future surveys to Access Areas and open bottom that may be reopened or have effort reduced or increased in the future. Repeatability, to narrow interannual variations in bycatch species distribution, for example, seems particularly important in the future. Reducing the bycatch of key species of concern should continue to be a major focus of future surveys. Given the overlap in timing of maximum meat yields, minimum fish bycatch and peak fish and scallop spawning times, apparent from the data from both the 2013 and 2015 projects, additional similar surveys should be planned.
- Relative to gear modifications to reduce the potential for scallop dredges to catch flatfish, while the 2013 study used a New Bedford dredge with a 10 row apron and 3:1 twine top hanging ratio and a Turtle Deflector Dredge (TDD) with an 8 row apron and 2:1 hanging ratio, the 2015 study states that a 7 row apron and a TDD was used as both the control and experimental dredge (has this become the industry standard given the success of the 2013 work?). One dredge broke and the remainder of the study used 2 TDDs both with 7 row aprons, apparently, but the twine top hanging ratios were not described.
- In the earlier study, the 2:1 ratio reduced flatfish bycatch and, in the later study, the 5 row apron further reduced flatfish bycatch and caught larger scallops. Work should continue comparisons between the 2:1 and 1.5:1 ratios, and the 5 and 7 row aprons, with consideration given to requiring a more tightly hung twine top as a proactive gear modification in all areas in the future, perhaps, since the data available from these studies seem to indicate that scallop catching efficiency is not significantly compromised although the bycatch of some flatfish can be reduced by as much as 10-20%.
- It seems that twine top hanging ratios may have some relationship to the number of lobsters caught and damaged during scallop fishing; it may be important to evaluate this question in future surveys.
- While the first study evaluated bottom water temperatures against scallop spawning timing and shell formation, and appeared to be correlated with gray meat and nematode distribution, bottom water temperature was not recorded in the second study. That is a lost opportunity. Future work should track water temperature to evaluate correlations.
- The second study seemed to indicate that a 2017 survey had been approved. Is this the case and where did the surveys take place? At this time, it does not seem important in the short run to continue to survey Northern CAII given the Agency’s decision to partially disapprove OHA2 by not opening this area to scallop fishing. I will look forward to a report on the 2017 survey if it took place.
- The second study evaluated Jonah crab distribution and sea star wasting disease, presumably to better understand scallop natural mortality. This is less important for this surveys relative to other goals, better addressed by the *Bigelow* spring and fall surveys.

- The PIs should be encouraged to focus their efforts rather than try so many things at once, some of which seem to be out of their expertise.

*Project: River Herring Bycatch Avoidance*

*1) Has there been a sufficient technical review of the project results and, if so, is that information available to the Research Steering Committee?*

- Yes. A detailed, and presumably NEFSC-supplied, technical review was provided, which raised significant concerns about contextualizing the findings. In particular, the technical review found that just the bare minimum of the expected work was done. I share those concerns, and have additional ones in light of the request that the RSC considers the “potential for using project information in a task the NEFMC expects to complete in 2018: developing a white paper on the consideration of river herring and shad as stocks in the Atlantic herring fishery (RSC Chair to RSC, “Charge to Committee for its January 17, 2018 meeting,” 27 December 2017, p. 4).
- At least three journal publications were derived from the work.

*2) Did the project accomplish all of its stated goals and objectives?*

- *Portside Sampling:* Somewhat less than the target of 50% of vessels were sampled, but this was not a significant detraction for the overall effort of the study and was enough to support sub-objectives.
- *Catch estimates:* The catch description was adequate, but catch and effort information in Tables 1 and 2 were disappointing. Firstly, catch and effort information really did not capture the effort portion of the tables. Presumably, the number of trips is an attempt to describe some element of effort. It does not. We are not provided with information on trip length, number of tows or the duration of the tows. Hence there are no statistics on surrounding “catch and effort” information. Table 1 and 2 only provide target and bycatch catch information for specific locations and seasons. Objective not met.
- *Incidental Catch Characteristics:* Length frequency and maturity information is minimal but some explanation is provided in the text.
- *River herring avoidance:* A reasonable high degree of success in meeting the stated objectives. The report does not offer suggestions for further work in the area. The report mentions that since May 2014 data from 51 mid water trawl trips have been incorporated into the bycatch avoidance system. Is the avoidance system still operational? Data was well presented and understandable. Objective met.
- *Net sensors:* Met objective, but information is limited.

*3) Are project deliverables available and formatted for use by the Council and its technical committees?*

- Somewhat. The data in the report are highly summarized. However, the catch/catch composition data has already been supplied to, and used, by the PDT. Presumably other data generated by the study is available as well.

*4) Does the project address an immediate management need or contribute to a long-term strategy to rebuild and sustain stocks?*

- Yes, the NEFMC will soon consider River Herring and Shad as “stocks in the fishery” and this information will be critical to that consideration.
- The project addresses a very important management need, namely robust catch characterization and avoidance of bycatch of river herring in the mid-water trawl fishery.



The data generated and the apparent success of the avoidance network suggests that this work should continue with a high funding priority.

*5) Does the project support past work and/or provide new information?*

- Yes. It greatly augmented catch and catch composition data collected, and provides information on how to successfully design and operate a bycatch avoidance program.

*6) Does it point to a management action not in place now, or offer an innovative solution to a problem?*

- No
- The project provides very robust data catch and catch composition data upon which to address contemporary management challenges.

*7) Did the project elucidate other information not specifically stated in the goals and objectives?*

- No, not sure

*8) Is there a need for further work or follow-on research such as wider field-testing?*

- Yes.
  - Genetic work on the stocks' rivers of origin is key
  - The linkage of real-time ocean conditions (temperature and salinities, especially) to movements of river herring and shad may be the key to avoiding these species when targeting Atlantic Sea Herring and Atlantic mackerel; this effort was not able to be advanced due to lack of funding but could be jointly conducted by collaboration between SMAST, the MWT and SMBT fleet and NEFSC ecosystems personnel (Manderson et al).
  - This work should continue on a repeating basis. Both the catch and catch composition data and the bycatch avoidance aspects are necessary to prosecute this fishery while minimizing river herring impacts. This work should be conducted annually, much like the Scallop RSA resource surveys.

*9) Who is the appropriate end-user and are there recommendations/caveats about how this information should be used?*

- NEFSC and NMFS River Herring Avoidance Committee and Council/ASMFC.
- For the catch and catch composition data, the end user is the PDT and other technical users. For the bycatch avoidance program, the end users are the mid-water trawl vessel operators and fishery managers.

*10) Overall rating based on the above criteria: excellent, very good, good, fair, or poor.*

- Excellent to very good. Needs better conclusion/recommendations/caveats about how this information should be used.

*11) Additional comments.*

- As a former partner in NORPEL (New Bedford herring and mackerel fishing company), I have direct experience with the genesis and first few years of this effort to identify and avoid river herring and shad bycatch hotspots. In 2008, we approached SMAST (Kevin Stokesbury) and MA DMF (David Pierce) and asked for help in developing a fleet wide bycatch avoidance system. With the assistance of Rep. Barney Frank, we were successful in developing financial support from NFWF for the first few years of a science-based program. The effort has focused on at-sea and portside sampling and developing hotspot maps that are turned around within 24-48 hours for vessel captains to use on a voluntary basis. SMAST and MA DMF deserve a ton of credit for their fantastic work and

dedication and ability to work closely with the industry and vessel captains. It was Kevin Stokesbury/SMASST who identified (in 2008) that knowing the ocean conditions in real-time was likely key to developing an ongoing effective avoidance system. The Mid-Atlantic ocean observing network has developed since 2008 into a relatively robust system, the result of NEFSC Study Fleet expansion and maturing of IOOS – funded observation and data management capabilities. My recommendation is to support the advancement of this real-time ocean conditions aspect of bycatch avoidance as these non-target species (River herring and shad) appear to have a preference for a different temperature-salinity profile than the target species (Atlantic sea herring and Atlantic mackerel).

- I am grateful for the PI's for providing their published paper on this research. I am also grateful for their enumerating the additional RH/S samples obtained through, in part, their efforts. I am not sure, however, how much of an increase in sampling those figures (an additional 5,311 alewives and 2,661 blueback herring samples) represented compared to previous sampling efforts. Furthermore, in their replies, the PI's cite their project as aiding in the procuring of additional funds for expanded sampling. How much more funding was procured, and more germane to the issue at hand, how much of this additional sampling was funded by that additional funding. It is difficult to assess PI's claims of "vastly" improved and "greatly" expanded sampling regimens without this contextualizing information.
- I share the technical review's concerns about the project's claims for sense placement. The final report lacks any information as to how and why their final position represented the "optimal" beyond ease of access. That is certainly something to consider. I would have liked to see some discussion as to other locations tested, evaluative metrics used to assess various positions, and perhaps some information as to how the custom-built housing as designed and why. Again, without these contextualizing comments, I am unable to assess their claims.
- The PI's replies to the technical review cited how the on-going project was used in discussions around catch-cap setting, but they did not address the review's concerns about future management measures. At PI's briefing of the Herring committee on the project's launch in 2014, I asked if the PI's considered how to ensure that the fleet would continue to avoid of RH/S bycatch without the program. The submitted final report argues that as a result of approximately 20 bycatch avoidance advisories, the fleet was able to lower its bycatch incidence rate sufficiently to lower bycatch thresholds. In 2016, however, after the project ended, RH/S caps were raised in response to industry seeking higher caps to avoid shutting down, resurrecting the concerns I had in 2014.
- The lack of larger management context, recommendations for future management actions, and the project's reluctance to also consider the human-behavioral aspect of their program suggests to me the project will have limited, but some, utility in future management efforts to reduce or eliminate RH/S bycatch.

#### *Project: Effects of Fishing on Herring Aggregations*

*1) Has there been a sufficient technical review of the project results and, if so, is that information available to the Research Steering Committee?*

- Yes. A presumably NEFSC-supplied technical review was provided. The work was also published in the *ICES Journal of Marine Science* in 2013.

*2) Did the project accomplish all of its stated goals and objectives?*

- No. The report outlines the difficulty of catching enough of the set-aside to fund the project. Due to apparent funding limitations related to the inability to use the entire



budgeted RSA quota, the scope of the study was reduced. Work related to defining localized depletion could not be completed. However, the study did examine the efficacy of using omnidirectional and down-looking sonar in tandem as a tool to assess localized depletion or estimate stock sizes.

*3) Are project deliverables available and formatted for use by the Council and its technical committees?*

- The project deliverables (a very brief summary plus an MS, later published) seem useable. It is not clear if the raw or processed data are available.
- The products from the study as it was ultimately executed are not really usable or applicable to Council or TC work, as the outcome of the work is highly technical information related to the setup, calibration, use, processing and interpretation of acoustic data collected from the particular acoustic equipment used in the study.

*4) Does the project address an immediate management need or contribute to a long-term strategy to rebuild and sustain stocks?*

- The NEFSC review suggests an "immediate" management need. Knowledge of the disruption of herring by fishing (that is, the intention of the study) would contribute to protection of herring stocks.
- No. While the study does not directly provide data that would directly address any management need, it does illustrate a potential tool that could be used to answer questions related to a current and relevant management concern – localized depletion.

*5) Does the project support past work and/or provide new information?*

- The project provided new or suggested methods for answering the research question as well as providing suggestions for the herring RSA program.
- The project provides a tool that could potentially provide new information.

*6) Does it point to a management action not in place now, or offer an innovative solution to a problem?*

- The proposed methods developed from this study appear innovative as a means for understanding impacts and developing an innovative solution.
- The project points to a tool that could be the basis for an innovative study to assess localized depletion in the Atlantic herring fishery.

*7) Did the project elucidate other information not specifically stated in the goals and objectives?*

- A potential method using forward-looking sonar was developed.
- Not that could be discerned.

*8) Is there a need for further work or follow-on research such as wider field-testing?*

- Yes. Given that the study was initiated almost 10 years ago, and that the evolution of acoustic equipment and acoustic data processing have surely advanced since then, follow-on work of applying the technology with newer equipment/processing algorithms would likely be appropriate.

*9) Who is the appropriate end-user and are there recommendations/caveats about how this information should be used?*

- Herring RSA administrators and potential fishing impact researchers.
- Researchers developing and using acoustics to characterize fish aggregations.

*10) Overall rating based on the above criteria: excellent, very good, good, fair, or poor.*

- Fair-good. While the project does not provide any management-ready results, it does illustrate the potential of a tool to provide such information.