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New England Fishery Management Council

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 John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

Research Steering Committee February 28, 2011 Marriott Courtyard Hotel, East Boston, MA Meeting Summary

The Research Steering Committee (RSC), chaired by Council member David Goethel, met on February 28, 2011 in East Boston, MA. Other committee members at the meeting included Council members David Preble and Glen Libby, Michael Pol of the MA Division of Marine Fisheries, Dr. John Hoey of the National Marine Fisheries Service's Cooperative Research Program (CRP), Dr. Bill DuPaul, of the Virginia Institute of Marine Science and David Beutel, fisheries and aquaculture coordinator at the RI Coastal Resources Management Council. Members Gib Brogan of Oceana and Dr. Fred Serchuk from the Northeast Fisheries Science Center (NEFSC) were unable to attend the meeting.

Patricia Fiorelli from the NEFMC staff was present along with audience members Travis Ford and Ryan Silva from the NMFS Regional Office. Rachel Feeny represented the Northeast Consortium.

This report summarizes the agenda items listed for this meeting in the order addressed by the committee.

Recap of the November 2010 meeting (see attachment A)

Pat Fiorelli reviewed the discussions at the last RSC for members and the audience.

Review of the purpose and functions of the recently established cooperative research "networks." The focus of this discussion was to review whether an "average" fisherman or researcher, if they not already plugged into a network or other group, are able to participate in cooperative research in the same or more effective ways than in previous years.

John Hoey, the Director of NOAA's Northeast Cooperative Research Program (NCRP) explained that a fisherman's ability to participate in cooperative research has changed very little with the establishment of networks. The intent, articulated in a Request for Proposals to fund networks, is to foster better coordination among scientists who work on similar or related projects. In turn, scientists and many fishermen believe they will achieve economies of scale through networking. Fishermen/participants can go to anyone in an identified network, for example the several conservation engineering networks, and have his/her project at least discussed and pursued if warranted. The networks also are working closely with sector managers concerning the types of projects that would best serve the industry, particular targeting those that address discards and species selectivity.

In this instance, teams of researchers/conservation engineering experts, such as those who participate in CEMFIN/GEARNET and REDNET, are expected to meet and work with

the fishermen to consider ideas, develop demonstration projects, agree on appropriate experimental designs for field testing, and other activities that would support and facilitate cooperative research, including the development, reporting and archiving of research results.

Proposals under consideration for network support will be vetted through participating scientists meeting as a panel, and funded according to the utility of the project. Networks are not closed to any individuals who wish to participate. To heighten awareness, the RSC Chairman recommended an online explanation of these programs, including details about how a researcher or fisherman might participate, and meeting announcements. Council staff suggested that the Council may benefit from a presentation by network spokespeople that summarizes their organization and activities, and answers questions in addition to creating further interest in cooperative research. The Chairman also suggested that Council staff, together with the cooperative research staff from the NEFSC, put together a briefing for the Scientific and Statistical Committee (SSC) reviewing 2000-2010 projects relative to their utility to stock assessments and setting annual catch limits.

Project reviews

The following reports contain the details of eight cooperative research project final reports. They were reviewed by the Research Steering Committee on February 28, 2011. All of the projects were funded by the Northeast Consortium and were accompanied by at least two technical reviews.

- a. **Drifter study of a front in the Maine coastal current system off Penobscot Bay, Maine**, Lewis S. Incze, Aquatic Systems Group, Proctor Wells, James Manning NEFSC, D.Grooks.

Study objectives: To use relatively inexpensive drifter technology and a small vessel to deploy, monitor and recover drifters during summer, concentrating on the area inshore of Monhegan Island.

The purpose was to examine the residual near-surface circulation of water inshore of the 100 m isobath on the coastal shelf between the Pemaquid Peninsula and Matinicus Island, Maine. The area is near the confluence of the Eastern and Western Maine Coastal Currents, but inshore of GoMOOS Buoy E, which is the nearest to our study area. Details of circulation inshore of the GoMOOS buoys are of interest for understanding the transport of plankton, including larval fish and invertebrates and harmful algal species, closer to the coastal environment.

RSC comments: Technical reviews ranged from fair to positive, including those from the committee. The RSC commented that the limited information provided confirmed previous drifter studies. The author, who was present via Skype, and who was more familiar with the subject matter than the RSC, maintains that project results enhance the understanding and modeling of plankton transport along the coast. Other than agreeing with the results of previous studies, the report failed to explain how this might be so. The RSC agreed that this work would be most useful to oceanographic researchers and possibly ecosystem/habitat scientists.

- b. **A biological study of the sand lance in the southern Gulf of Maine**, Dr. Les Kaufman and Briana Brown, Boston University.

Study objectives: 1) To develop gear that could capture sand lance alive and uninjured, as well as measure abundance in a quantitative and replicable manner; 2) to test the hypothesis that *A. dubius* and *A. americanus* could be considered as a single taxonomic unit for management purposes as they fill identical ecological niches; and 3) To develop husbandry methods that would keep sand lance alive during transport and captivity for long-term behavioral studies.

RSC comments: The RSC supported the two independent evaluations that highlighted both the technical merits and shortcomings of the study. The committee agreed that the first two attempts to develop sampling gear were not successful, while the modified shrimp beam trawl had limited success in capturing sand lance alive, but not in measuring abundance --- possibly an artifact of a poor spatial sampling design, according to the RSC. As stated at the meeting, “The report acknowledged the limitations of the data to satisfy the objective of developing an efficient sampling gear which could be used in developing indices of abundance.”

It also was pointed out at the meeting that available technologies do exist (Appendix 1 and 2 in the 2010 Report of the ICES Benchmark Workshop on Sandeel”) that might be adapted for use in this region more successfully than the project under discussion. The committee agreed that the morphometric study was reasonably successful in delineating the two species of sand lance, but was remiss in describing the degree of overlap between the two species. Possible users of this work could include the Ecosystem Processes Division at the Northeast Fisheries Science Center (NEFSC).

- c. **Selective gear research and development to reduce bycatch: Investigating the use of square mesh side panels and increased taper in a groundfish trawl**, Capt. Stanley Coffin, Dana Morse Maine Sea Grant, Claudia Coffin and Capt. Kelo S. Pinkham.

Study objectives: This project had two objectives: 1) To evaluate the escapement properties of both square mesh side panels in a 4-seam groundfish trawl, and of square mesh panels used in conjunction with increased taper in the trawl belly; and 2) To conduct outreach about the project and its results to the funding agency, industry, and other interested parties.

RSC comments: Both experimental designs showed a reduction in sublegal fish, although each had a fair loss of target species, especially cod and haddock. The RSC noted that a full description of the modified gear was missing as well as any diagrams, elements that would be valuable with respect to future research. The need for stronger modeling and a better presentation of the statistics was pointed out by RSC members as well as one of the technical reviewers. Despite criticisms, several RSC members thought the project was unique and look forward to the follow-on work that may be underway. Gear researchers in particular may benefit from the results of this project.

d. **Effects of the Western Gulf of Maine Closure Area on groundfish populations in rocky habitats**, Raymond E Grizzle, UNH.

Study objectives: The overall goal of the project was to provide information to managers about the role of rocky habitats — which in many cases are areas not sampled in trawl-based research and monitoring — in the Western Gulf of Maine Closure Area (WGOMCA) with respect to groundfish stock rebuilding. The major objectives were to: 1) Determine the effects of the WGOMCA on fish use of rocky habitats; 2) Characterize fish use by species and size classes in major rocky habitat types; and 3) Initiate an assessment of gillnets as sampling tools for rocky habitat by identifying variables that may affect their effectiveness.

RSC comments: The technical reviews indicated that the use of paired sites inside and outside of the closure area demonstrated that many species were found in much greater concentrations inside the closure area. The second objective was not met, although further analyses might address this issue, according to the author. He concluded that that the closure area functions as a refuge for three major groundfish species, but likely functions as nursery habitat only for pollock. He further believes that the fish data collected corroborate earlier findings indicating recovery of benthic invertebrate communities in some areas.

The successful use of gillnets as a sampling tool was perhaps somewhat overstated, according to the committee. RSC members held that the use of this gear type for this purpose is still not well understood. Others were of the opinion that the conclusions of the report did not follow on the data presented.

There was agreement that analyses now underway by the principal investigator concerning the effects of sample location, season, habitat type, on groundfish species abundance and size composition are fundamental to determining if the WGOMCA is having a measurable effect on groundfish stock rebuilding. Given that there are many other closed areas in the Gulf of Maine/Georges Bank region, the results from this area are important to assessing the general utility of fishing area closures as management tools in promoting stock recovery. The RSC concluded that any lingering or unfinished analyses would be critical to obtain before the present study could be useful in a management context.

e. **An Atlas Based Audit of Fishing Territories, Local Knowledge, and the Potential for Community Participation in Fisheries Science and Management**, Kevin St. Martin, Madeleine Hall-Arber.

Study objectives: The project's main objective was to produce an atlas that would document those areas and resources on which fishermen and their communities depend most. The PIs intent was to produce a series of maps that would be useful to potential participants in cooperative research efforts and in identifying those who might be most affected by management initiatives that have an areal component. The maps also were used by the PIs to assess the nature of fishing territories as used by local communities, as well as the environmental knowledge of fishermen and their willingness to work with fisheries scientists and managers.

RSC Comments: Committee comments were almost unanimously positive about a project that uses fishermen's knowledge to enhance the understanding of how fishing areas are used by nearby communities. Researchers subsequently conducted interviews using the maps as a focal point to derive more refined information project participants about their use of the areas over time.

The committee did voice concern about the use of vessel trip report (VTR) data to develop maps that depicted fishing areas. Fishermen on the RSC maintained that the areas were remarkably consistent with known fishing patterns despite the fact that VTRs have been shown to be spatially inaccurate when ground-truthed with information collected by at-sea observers.

- f. **Mapping mobility: The movement of New England Multispecies vessels and crew in New England and beyond from 1994-2004**, Jennifer Brewer, Sarah Robinson.

Study objectives: The three-part study examined patterns of mobility and immobility in fishing businesses located in Gloucester, MA and Portland, ME. The project also examined social structures and practices that might influence related business decisions. Through scientific and industry collaborations, the PIs collected and analyzed quantitative and qualitative data via interviews with random samples of industry members in the two ports. The study covers approximately two decades, with years of interest beginning in 1983.

RSC comments: Several RSC members were concerned about the timeframe covered by the report --- information was collected in 2005 and 2006 --- while the recollections of participants spanned almost two decades. Members pointed out that catch histories were not used as the PIs documented changes in fishing patterns, although sampling for the project interviews was considered to be well-done. Others commented that PIs findings accurately documented the circumstances of the fishery during the period described and agreed that such work could be valuable in an historical context, particularly given the adoption of sector management.

The authors made themselves available to the RSC to discuss their results and offered a number of insights that might be useful to end users of the information they provided. The study could be useful on several different levels and was recommended to the Council's Groundfish Plan Development Team as background for the social impact section of the Groundfish FMP or SAFE Report.

- g. **Testing raised-webbing gillnets to reduce bycatch of cod while targeting pollock**, Steve Eayrs and Daniel J. Salerno, GMRI.

Study objectives: To evaluate the use of raised-webbing gillnets to reduce the bycatch of cod and other demersal species of concern while targeting pollock in the western Gulf of Maine

RSC comments: The RSC was supportive of the project despite several problems and agreed with the summary of conclusions by the authors, “The raised webbing gillnets were useful in decreasing bycatch, which led to less discarding. Overall, the experimental gear caught less by weight and by number for all species than the standard configuration in both years of sea trials, 2007-2008.” The findings, however, should be considered preliminary because of several factors that may have influenced the project’s outcome.”

Problems were encountered with sampling, concerns about large amounts of regulatory discards, the high abundance of spiny dogfish and low catches of cod and pollock and the real-time performance of the gear during the soak duration. It is noteworthy, from the perspective of both the authors and the RSC that the experimental gear displayed reductions in spiny dogfish catch, by weight and numbers, over the standard gear. The committee recommended dissemination of the project to sector managers and other fishermen, who may be very interested in reducing the amount of dogfish in their gear. The RSC encourage follow-on work.

- h. **Haddock migration in New England Waters: Analysis of closed areas and stock boundaries**, Tom Rudolph, Cape Cod Commercial Hook Fishermen’s Association.

Study objectives: Part of a long-term study, this mark-recapture program over 20,000 haddock were tagged and released over a two-year period throughout the range of the fish. Deployments were designed to provide information on fish movements between stock and sub-stock management units and across the boundaries of four areas closed year-round to the groundfish fleet, except as part of a special management program. Based on preliminary results, the principal investigators contend that haddock move between U.S. and Canadian waters and that move across closed area boundaries.

RSC comments: Principal investigator Tom Rudolf was available to the RSC via Skype. RSC members agreed with the technical reviews, pointing out the bullet points on p. 27 of the report, and in particular the last bullet point, given its summary nature. “Haddock in the Georges Bank and Gulf of Maine regions constitute a metapopulation, i.e., consist of a group of spatially separated populations (of the same species) which interact at some level. The committee was also concerned about tagging mortality and recommended follow-on work that would address this issue.



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Attachment A

MEMORANDUM

November 15, 2010
Rev. February 28, 2011

TO: RSC Chairman David Goethel
FROM: Patricia Fiorelli, Council staff
SUBJECT: Research Steering Committee Meeting, Nov. 12, 2010

This meeting follows on a telephone conversation between the committee chair and several committee members in August during which they agreed it would be desirable to have a dialogue about refocusing the committee's efforts.

Purpose of the meeting

To encourage an open conversation among RSC members about the core functions of the RSC and how it might become more effective, given the many changing external circumstances in regional fisheries management and operations. Some of these circumstances include:

1. The SSC – now designated by MSA to develop research recommendations
2. Northeast Cooperative Research Program Initiatives – including network formation for conservation engineering
3. Sector formation – could serve as a communications vehicle; some, groups are now more interested in resolving bycatch problems and possibly other resource and fishery-related issues through cooperative research

Topics and Issues Addressed

1. **Overview of NCRPP Activities** - Briefing on the recent activities of the Northeast Cooperative Research Partners Program. Program director John Hoey provided an overview of recent program activities, budget and status of funding (unknown at this time). At a future meeting, the RSC will be provided with a list of the most recently funded projects, the objectives of each project, the level of funding provided by the federal government and project deliverables.
2. **Overview of Northeast Consortium Activities** – Discussion of the range of projects, symposia and sponsored events.
3. **How should it carry out its value-added role?"** There was agreement that the committee can provide a transparent forum for a discussion of issues, a forum for

participation in strategic planning exercises, steering and oversight of cooperative research in general and coordination with other funders, in addition to NCRP in New England. At the same time, there was recognition of the need to raise general awareness of the successful cooperative research projects that have been completed and in particular, to reach out to the sector managers, gear researchers and other groups (Sea Grant, etc.) to help accomplish this.

4. Core committee functions

- a. **Conduct management reviews of completed cooperative research projects.** In discussing this issue, the RSC agreed on the following:
- b. **Promote and oversee linkages between funded projects and management and science issues; ensure incorporation of useful results into the management process and final disposition of results; raise the visibility of the projects; determine how and where linkages may be breaking down.**
 - Receive a briefing at the beginning and end of NCRP-funded projects.
 - Raise the overall visibility of the programs; reach out to industry through an annual meeting, similar to Northeast Consortium so that PIs might present work to peers and managers;
 - Address the administration and implementation of the three Council RSA programs to improve efficiency, timeliness and communications issues associated with the programs. Request presentations of RSA projects at Council or other meetings focusing on research areas – for example, scallop resource surveys, turtle research, bycatch reduction across fisheries, etc. to create an awareness of the research funded through the RSA's that are authorized in FMPs; Consider an effective mechanism to coordinate the issues of RSA priorities and final project review; re-think relationship between the oversight committees (priority-setting) and the RSC. Forward any recommendations to Council oversight committees for further consideration
 - Encourage outreach efforts and public awareness about gear research; are sectors a new audience that would benefit from information transfer? Encourage or steer successful projects into the management arena;
 - Consider alternative committee meeting venues (webinar, etc.) to accomplish committee these tasks.
- c. **Develop cooperative research priorities – different focus than the SSC list of research priorities; encourage NMFS to use the proof of concept approach to test new ideas; explore otherwise ignored topics (i.e. aquaculture).**
- d. **Add value to NCRP solicitations through better coordination/communication with the Council, its staff and the NCRP staff, or other mechanism.**

5. Additional Tasking

- a.** Revisit the existing Research Steering policies and make recommendations to the Executive Committee as appropriate. [staff follow-up]
- b.** Recommend new members to the Executive Committee to augment the existing expertise on the RSC (Teresa Johnson from UMO, Steve Welch, Mike Walsh, Ted Platz, Dan Salerno, Ryan Silva from NERO). Also, solicit RSC member nominations from Council members. [staff follow-up]
- c.** Develop or recommend elements of or a protocol to integrate successful gear modifications into the management process; May be a possible task for the conservation engineering network.





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Research Steering Committee Meeting March 16, 2011 Crowne Plaza Hotel, Danvers, MA Meeting Summary

The Research Steering Committee (RSC) met on March 16, 2011 in Danvers, MA. The meeting was attended by Committee Chair David Goethel, as well as the other members of the Council who serve on the RSC --- Vice Chairman David Preble and Glen Libby. Committee members Dr. Bill DuPaul of the Virginia Institute of Marine Science, Drs. Fred Serchuk and John Hoey of the Northeast Fisheries Science Center, Michael Pol of the MA Division of Marine Fisheries, David Beutel, fisheries and aquaculture coordinator at the RI Coastal Resources Management Council. Gib Brogan of Oceana also participated as well as Council staffer Patricia Fiorelli. This was the first RSC meeting for new member and southern New England fishermen Ted Platz, who also serves on the Council's Monkfish Advisory Panel.

Audience members included Dr. Earl Meredith, Ryan Silva, Travis Ford and Carolyn Woodhead, all from the NMFS Regional Office; Ron Smolowitz of Coonamessett Farm, and Rachel Feeney and Dr. Chris Glass from the Northeast Consortium. Additionally, Jon Knight from Superior Trawl, fisherman Donald Fox of the *F/V Lightning Bay* and *Stephanie Bryon*, and Laura Skrobe from the URI Fisheries Center attended the meeting to provide input during the review of the final "mini-eliminator" trawl report.

Improving the Effectiveness of RSC Operations

The committee raised a number of issues during this discussion, including the following expression of purpose. Contingent on ongoing funding of committee activities, the RSC will continue its role of adding value to the process by providing management advice when undertaking cooperative research project reviews, but also would like to place equal emphasis on its broader "steering" function.

Research Review Policy - Issues identified during RSC consideration of any necessary changes to the policy

1. RSC reviews must be completed in a timely manner. Additionally, the committee agreed that because of limited resources it is probably not realistic that the RSC will review all cooperative research projects. Although a challenge with respect to staff and committee resources, the RSC also would like to better track projects supported through the NEFMC's three research set-aside programs (RSAs). Currently, the use of project results are largely the domain of the Council's plan development teams.

2. Peer reviewed journals produce work of varying quality and should not be the exclusive measure of whether cooperative research project results are suitable for use in a management context.

3. During this agenda item discussion and because any such review is lacking in the process, the suggestion was made that methods used in the ongoing resource surveys supported by cooperative research funds should be considered at least once by the RSC. Further, the RSC also may review all resource surveys funded through cooperative research grants to determine whether such monitoring projects should be funded through a more permanent and non-competitive method.

4. The subject of duplication and overlapping surveys was identified. These and other issues will be placed on a future meeting agenda and will include a review of additional mechanisms to fund ongoing surveys besides the cooperative research grants program. All principals and interested parties will be notified when any discussions of this type are scheduled.

5. As the Council supports more time and place-based resource monitoring, the RSC may discuss the types of “research” vehicles used to inform management. In particular, the need for a periodic synthesis with respect to broad cooperative research areas or topics also was identified, i.e., turtle research, bycatch and discard mortality studies, etc., in addition to resource surveys.

6. Edits to the Council’s research review policy will be reviewed at an RSC meeting in the near future.

Discussion of the *Science* publication Challenges and Opportunities of Open Data in Ecology

Intended as food for thought, the RSC was supportive of the contents of the paper concerning data sharing. Most felt the journal article outlined an idealized world and that data maintenance, accessibility and standardization are still challenges for many institutions and individual researchers. Acknowledging that training and incentives are missing in this area, the committee also noted that the issues of transparency and accessibility may not be emphasized enough in the RSC’s project reviews.

The committee also discussed the problem of accessibility to key databases in the region, particularly the VMS database and the necessity for a substrate/GIS database, to better serve the research community and public. With respect to the Council’s research review policy, it was suggested that greater emphasis be placed on insisting that principal investigators provide their data to funders in a usable format. The follow-on to that is a request for much greater institutional support for data standardization, archiving and accessibility.

Final project report review: Exploring Bycatch Reduction in the Haddock Fishery Through the Use of the Eliminator Trawl with Fishing Vessels in the 250 to 550 HP Range; Laura Skrobe, URI Fisheries Center, David Beutel, Coastal Resources Management Council, and Jon Knight from Superior Trawl in Wakefield, RI.

Project objectives: The project principal investigators (PIs) explored the performance of two large mesh-faced bottom trawls designed to capture haddock while reducing the bycatch of cod and other species --- one with a 184 cm x 40 cm fishing circle and the other with a 250 cm x 40 circle. The nets tested were smaller versions of the previously tested “Eliminator Trawl™ (315 x 40).

The PIs concluded that the tested gears significantly reduced catches of cod, as well as yellowtail, winter and witch flounders, American plaice, monkfish and skate. They reported that the catch of

haddock did not differ significantly between nets, but agreed the 184 x 40 net needs further work before being considered in a management context. They recommended the 250 x 40 net be used to reduce catches of fish still in rebuilding programs while targeting haddock or other more abundant species. Finally, and for clarification during the meeting, one of the PIs commented that the Eliminator trawl is not a Ruhle trawl, but should be considered a bycatch reduction tool.

RSC comments:

Several RSC members viewed the project as useful to management and were impressed by the testimony of fishermen at the meeting who confirmed their successful use of the net. Other members found technical shortcomings. Some would have preferred to see a species breakdown and length-frequency distributions provided, as well as the tow-by-tow data. Others stated that the report did not explain why a reduction in the bycatch species occurs and questioned whether the project results were generalizable. Again, fishermen at the meeting and on the committee added that fish behavior plays a large part in the successful operation of this gear type.

Agreeing with the technical reviews provided in their package, committee members discussed the lack of information about the similarities and differences between the control and experimental gears and a failure to undertake robust statistical analyses. All members agreed that, while the project shows promise, the PIs should return to the committee with more complete information --- the tow-by-tow data and completed statistical tests.

Review of an NEFSC-prepared inventory of cooperative research projects

The RSC systematically reviewed summaries of the 102 RSA projects funded from 2000-2010 and the projects supported by the Center's Northeast Cooperative Research Program, the Northeast Consortium and the Southern New England Cooperative Research Initiative. The purpose was to provide the committee with familiarity and perspective in order to make meaningful recommendations in the future. Issues that were discussed included data sharing, accounting for research funds, the backlog of projects in the system, online project inventories and other operational issues. Overall, multi-year grants and specifications with fixed quotas for research have improved the efficiency of the RSA programs. The Council will receive a copy of the list pending revisions.

The committee recommended that the Council send a letter to NMFS expressing the need for an effective system to track the receipt of final reports so that technical reviews are completed and reports are forwarded to the RSC in a timely manner. Greater institutional support is needed to ensure this occurs as a matter of course and that projects are not held up as the result of electronic snafus that may affect the substantial investment made in cooperative research efforts in the Northeast.

Research Steering Committee Meeting
April 14, 2011
Holiday Inn, Mansfield, MA
Meeting Summary

The Research Steering Committee (RSC) met on April 14, 2011 in Danvers, MA. The meeting was attended by Committee Chair David Goethel, as well as the other members of the Council who serve on the RSC --- Vice Chairman David Preble and Glen Libby. Committee members Michael Pol of the MA Division of Marine Fisheries, Drs. Fred Serchuk and John Hoey of the Northeast Fisheries Science Center (NEFSC), Gib Brogan of Oceana and fishermen Ted Platz also participated.

Audience members included Dr. Earl Meredith, Ryan Silva and Travis Ford from the NMFS Regional Office and Cheryl Corbett from the NEFSC. Additionally, Meredith Mendelson, manager of Northeast Seafood Coalition Sector 5, Jon Knight from Superior Trawl, and Laura Skrobe from the URI Fisheries Center attended the meeting to provide the information requested by the RSC at its last meeting.

The purpose of the meeting was to complete the RSC review of the Eliminator Trawl™ project. Project PIs provided the information requested at the March 16 RSC meeting and reviewed the information for the committee.

All members agreed that the Eliminator trawl recommended (250 x 40 net) caught fewer flatfish than the control nets on nearly every pair of tows. The gear worked well to separate the amount of legal sized cod and haddock and catches of flatfish (although the sample size was small) and significantly reduced catches of monkfish and skates.

Industry members had supported the utility of the net in reducing discards and its potential to facilitate fishing in areas designated for Special Access Programs. Fishermen also recommended that a separate gear code be assigned to this gear type to document the level of discards that can be assigned to it.

The Committee agreed to recommend the project to the Groundfish Committee and its Plan Development Team for consideration as a “new gear” in the B-regular DAS program and in the Eastern U.S./Canada Haddock SAP. Project PIs will follow up with a request to the Council’s Executive Director as outlined in the Council’s policy handbook.

Summary of 2010 Cooperative Research Conservation Engineering BAA Projects

April 2011

The Northeast Cooperative Research Program's (NCRP) Strategic Plan, developed in 2009 and approved by the Northeast Region Coordinating Council, calls for the development of a comprehensive conservation engineering program to achieve regional coordination and technology transfer to industry by establishing a network of fishermen, fishing gear manufacturers, gear engineers, marine scientists, marine fisheries economists, fishery managers and State/Federal agencies to conduct multidimensional research and technology transfer to commercial marine fisheries.

In order to develop this Conservation Engineering Network, the NCRP is supporting seven networked conservation engineering and bycatch reduction proposals funded at over \$3.0 million. Though each proposal will be adapted and modified over the life of the project according to the needs of the network, a brief description of each project and its initial role in the CE Network is given below.

Two proposals were funded which focus on bycatch reduction in small mesh fisheries targeting *Loligo* squid:

***1. Collaborative Network Approach to Reduce Bycatch in the Southern New England/Mid-Atlantic Squid Trawl Fishery* (Cornell Cooperative Extension, University of Massachusetts-Dartmouth School of Marine Science & Technology, University of Rhode Island)**

This project has been funded to seek solutions to bycatch issues in the *Loligo* squid fishery by evaluating and optimizing several potential gear solutions. The project will also establish an outreach and extension program for successful gear selectivity in the SNE/MA small mesh fishery, and quantify the socio-economic benefits of improved selectivity and bycatch reduction based on project results.

Optional future phases of the project may be implemented to broaden the research focus to determine spatial and temporal distribution of target and bycatch species, and adopt real-time data collection protocols to collect and use data within the SNE/MA small mesh squid fishery. If successful, the project participants are prepared to employ the same network concept and strategies for other small mesh fisheries.

***2. Experimental approach to butterflyfish bycatch reduction in the N. Atlantic *Loligo* fishery* (Garden State Seafood Association, Cornell Cooperative Extension, Rutgers University, University of Delaware, University of New Hampshire)**

This proposal has been funded to develop ecologically informed models for the specific purpose of reducing butterflyfish bycatch in the *Loligo* squid fishery in the Mid-Atlantic Bight using Integrated Ocean Observing System (IOOS) habitat models developed with Fisheries and the Environment (FATE) project, and merged with behavioral models of squid fishermen.

Optional phases of this project may include an investigation into the *Diet and Fatty Acid Signature Analysis of Longfin Inshore Squid*. The goal of this project would be to better understand the role of longfin inshore squid as a predator in the Northeastern US continental shelf ecosystem. Results would be expected to improve ecosystem-based management of *Loligo* and their prey species by clarifying the role of *Loligo* as predators. An additional optional study includes *Modeling of bycatch reduction and Loligo predation effects on the population dynamics of butterfish*. The goal of this portion of the project would be to synthesize the results of the projects on habitat modeling and *Loligo* diet analysis, along with the gear modifications developed under Project 1 - ***A Collaborative Network Approach to Reduce Bycatch in the Southern New England/Mid-Atlantic Squid Trawl Fishery*** within the existing butterfish stock assessment model to examine the population level impacts of different bycatch reduction strategies.

One proposal was funded which focuses on the development of small mesh fishery solutions for a sustainable redfish fishery.

A Network to Redevelop a Sustainable Redfish (Sebastes fasciatus) Trawl Fishery in the Gulf of Maine (REDNET) (Massachusetts Division of Marine Fisheries, Maine Department of Natural Resources, Trawlworks, Superior Trawl, Reidar's Manufacturing Inc. Associated Fisheries of Maine, University of New Hampshire, several vessels)

The goal of this project is to devise strategies and test means to sustainably harvest the redfish resource in the Gulf of Maine through a network approach, including fishing enterprises, gear manufacturers, researchers, social and economic experts, and managers. The network group will define the research pathway for conceiving, developing and implementing research and outreach strategies to sustainably access the redfish resource under the current sector and ACL management regime.

Potential out-phases of this project could include the development of a real-time, temporal-spatial management tool, or expansion of results into other small mesh fisheries, such as whiting.

Two proposals were funded to investigate and develop gear-based solutions to large mesh groundfish fishery bycatch issues:

1. A Network approach to conservation engineering for the New England groundfish fishery: collaboration, outreach and demonstration of alternative fishing gears (Gulf of Maine Research Institute, University of Massachusetts-Dartmouth School of Marine Science & Technology, Superior Trawl RI, Massachusetts Division of Marine Fisheries, four vessels)

This proposal has been funded to research and demonstrate alternative trawl or other gears which have the potential for reduced bycatch and discards in the groundfish fishery, the use of catch sensors for greater catch control, and other emerging sector needs on a sector-by-sector basis. This project plans to investigate and test specific sector's needs and ideas, and facilitate industry's adoption of alternative gears into commercial practice.

2. CEMFIN: Conservation Engineering Marine Fisheries Initiative (*Massachusetts Division of Marine Fisheries, University of Massachusetts-Dartmouth School of Marine Science & Technology*)

This proposal has been funded to investigate a novel gear approach to bycatch control by attempting to develop a system that closes off the codend on demand, prevents additional catch, and allows fish in other parts of the trawl to escape. In addition, this proposal contains the means to support other gear-related projects within the network by providing funds for vessel-time and sea-going staff at much lower overhead rates than available through other entities. In addition, a portion of the funding has been designated for network equipment purchases or replacements, should the need arise. The CEMFIN proposal provides a great deal of flexibility for overall network field operations and support, as well as developing research needs as determined by network participants.

Two proposals were funded to investigate and develop temporal-spatial solutions to large mesh groundfish fishery bycatch issues:

1. Improving fishing efficiency through spatio-temporal tools to reduce bycatch (*Cape Cod Commercial Hook Fishermen's Association, Duke University, Island Institute, Groundfish Port Clyde Sector, Groundfish Fixed-Gear Sector*)

This project is funded to develop a temporal-spatial tool associated with the existing Sector Manager Tool currently in use in some sectors to assist fishermen throughout the region in avoiding non-target species that have the potential to shut down groundfish fisheries. The project will utilize retroactive data via logbooks, EVTR, landings, oceanographic data, etc., and real-time data from selected sector reporting data streams in the analyses to provide near real-time management and decision options. The project team will synthesize available information for fisheries managers through an analytical framework for the spatio-temporal management of fisheries to reduce non-target species interactions and increase fishing efficiency, and develop a concrete, user friendly tool that is an extension of the existing Sector Manager Tool. This tool should increase economic efficiency within sectors through targeted harvesting that capitalizes on healthy stocks while avoiding weak stocks.

2. Spatial and temporal information management for bycatch avoidance in New England Groundfish Sectors (*Gulf of Maine Research Institute, University of Massachusetts-Dartmouth School of Marine Science & Technology, Ocean Data Products, Groundfish Sector 5, Groundfish Sector 6, Groundfish Sector 10, University of Maine*)

This project is funded to take a broader view of the utility and potential for temporal-spatial information tools and work closely with the fishing industry to design a decision support system that will effectively deliver information to them to help minimize bycatch.

While the previous project *Improving fishing efficiency through spatio-temporal tools to reduce bycatch* focuses on developing a temporal-spatial tool for use with a particular software system, the partners on this project will take a broader perspective of the possible mechanisms for a temporal-spatial bycatch avoidance tool, and develop a detailed set of product functional requirements that will describe what information fishermen need, how they need to interact with it, and how it can be effectively delivered to them (e.g., website, email, text message, etc.). The information management team will develop a set of technical product requirements that describe the information architecture (hardware and software) required to implement the functional requirements. The project proposes to develop a spatially-enabled relational database management system that will support the delivery of data to near real-time information products (e.g., web based maps). This component will need to be housed within the Science Center to maximize the use of the data stored there and unavailable for distribution because of confidential considerations.

While this project will record the requirements for the Sector Manager Tool project described above, the addition of the real time information from EVTR systems may need to be developed as a distinct component that can function with the differing systems being developed (such as Olfish, SIMMS, FLDRS and Fishtrax). Thus, while the above project will complete work to provide this component to a particular tool, the GMRI team will develop a set of requirements that would enable a component to be developed for any of the electronic reporting tools. This will facilitate the possible development of temporal-spatial management tools for any of the network projects described here.

One proposal was funded to address data analysis and methodology review of fixed gear surveys:

Cooperative industry/university/ government-based scup and sea bass survey utilizing fixed gear: catch rate analysis and survey peer review (University of Rhode Island, Rhode Island Department of Environmental Management, Massachusetts Division of Marine Fisheries, Three vessels)

This project will consist of a thorough analysis on all the Research Set-Aside scup pot survey data collected to date, and a peer review workshop where this analysis will be thoroughly reviewed. The workshop will involve scientists from NMFS and outside experts, and will review the current state of knowledge involving fixed gear studies, with a particular focus on scup and black sea bass, as well as make recommendations for the sampling design of expanded fixed gear surveys.

NOAA Fisheries Service Cooperative Research Funds \$3 Million Bycatch Reduction Network for Northeast and Mid-Atlantic Fisheries

In 2010, the NOAA Fisheries Service Northeast Cooperative Research Program (NCRP) awarded more than \$3 million to support the development of a conservation engineering and information technology network. This network brings together fishing industry, academic, and state and federal government partners to develop multi-disciplinary approaches to conservation engineering in Northeast and mid-Atlantic fisheries.

A recently expanded definition of conservation engineering includes the development of fishing technologies to conserve target and non-target species, the study of fish behavior, and techniques to minimize bycatch while promoting the efficient harvest of target species. These approaches include gear design and operation, as well as analyses of fish distribution and environmental factors. New information technology tools such as enhanced mapping and communication methods will help fishermen reduce bycatch.

New Research

The 2010 NCRP awards bring together more than 80 individuals from 35 organizations to design fishing gear that will improve the industry's ability to avoid certain stocks so healthier stocks can be fully harvested. Studies will also focus on patterns of fish distribution, environmental factors, and the real-time exchange of detailed information to identify bycatch hot spots so that fishermen can avoid these as well.

Regional research teams will share resources for developing and transferring new gear, information, and operating practices to the industry. Project participants include fisherman and gear manufacturers who will provide ideas, at-sea expertise and guidance on larger scale testing of the most promising new gear designs. These teams will initially focus on small mesh fisheries including squid in Southern New England and the Mid-Atlantic and redfish in the Gulf of Maine, and large mesh groundfish fisheries in which concerns about bycatch are priorities.

“The goal is to measurably improve gear selectivity and support the industry in avoiding critical stocks with low annual catch limits (choke stocks),” said the program’s Director, John Hoey. “We must encourage broader fishing industry engagement in the planning and implementation of bycatch research to ensure that their highest priorities are addressed and the most promising new gear and technological tools are delivered to the industry in the shortest time possible to help maximize their catch.”

On-Going Research

The current projects build on 2009 awards providing \$1.0 million to investigate shrimp, whiting, and drop chain net designs, evaluations of cod end catch sensors, and a topless flatfish net for turtle bycatch reduction. 2009 /2010 funds further support analysis of fixed gear survey data for scup, an evaluation of the Rhode Island State Fluke sector, and a fixed gear survey for Atlantic wolfish.

Cooperative research activities directed by the Northeast Fisheries Science Center include a \$1.3 million trawl survey sweep study to address flounder and skate assessment questions, and \$3.5 million for contracts for study fleet vessels to increase fine scale catch and effort information, the collection of data for age, growth, and maturity studies, conservation engineering project support, and dogfish tagging to address stock boundary and age and growth questions.

In addition, 2009/2010 NCRP funding provided \$3.5 million to the Commercial Fisheries Research Foundation and \$1.5 million to the Northeast Consortium to sponsor research competitions that have already resulted in 17 additional collaborative projects.

Recent NMFS Northeast Cooperative Research Program, Commercial Fisheries Research Foundation, Northeast Consortium, and Research Set Aside Program Awards.

Projects funded thru FY08 earmarks, FY09 and FY10 Supplemental Sector and Base NMFS Northeast Cooperative Research Program allocations.

NEFSC NCRP Funded Projects

FY09 Competition

1. Are codend catch sensors a practical operational tool for sector quota management?
2. Bycatch, social and economic performance evaluation of RI State Fluke sector.
3. Topless trawl study for SNE and Mid-Atl summer flounder trawl fishery to reduce sea turtle bycatch.
4. Technology transfer and further research on alternative whiting trawl design with large mesh belly window in Maine whiting fishery.
5. Enhanced biological sampling and pilot survey for wolffish in inshore Gulf of Maine.
6. Design and testing of squid trawl with raised footrope rigging and a grid device to reduce winter flounder, scup and butterfish bycatch (SQUIDGRID).
7. Exploring bycatch reduction of summer, winter, yellowtail and windowpane flounders using 12" drop chain trawl net in SNE small mesh fishery.
8. Gear technology transfer: topless shrimp trawls for Gulf of Maine shrimp fishery.

FY10 Competition

1. Collaborative network approach to reduce bycatch in the Southern New England/Mid-Atlantic squid trawl fishery.
2. Experimental approach to butterfish bycatch reduction in the North Atlantic *Loligo* fishery--habitat modeling.
3. Improving fishing efficiency through spatio-temporal tools to reduce bycatch
4. A spatial and temporal information management tool for bycatch avoidance in New England groundfish sectors.
5. A network approach to conservation engineering for the New England groundfish fishery: collaboration, outreach, and demonstration of alternative fishing gears.
6. CEMFIN: Conservation Engineering Marine Fisheries Initiative.
7. A network to redevelop a sustainable redfish (*Sebastes fasciatus*) trawl fishery in the Gulf of Maine (REDNET).
8. Cooperative industry/university/ government-based scup and sea bass survey utilizing fixed gear: catch rate analysis and survey peer review.

NEFSC Trawl Survey Research – vessel survey contracts

1. Twin trawl - cookie - rock hopper sweep comparison in Southern New England.
2. Paired vessels – cookie – rock hopper sweep comparisons in GOM, GEB, SNE.

NEFSC Research – vessel contracts

1. Dogfish Tagging in Southern New England, the Gulf of Maine, and Georges Bank

Commercial Fisheries Research Foundation

FY08 awards

1. Reduction of butterfish and scup bycatch in the inshore *Loligo* squid fishery.
2. Evaluation of new turtle excluder device (TED) design in the SNE and Mid-Atl summer flounder trawl fisheries.
3. Examining settlement dynamics of postlarval American Lobster in management area 2.
4. Discard mortality estimation of the SNE flatfish complex using RAMP methods.
5. Job satisfaction, well-being and change in SNE fishing communities.
6. Buzzards Bay lobster resource: are changes in reproduction having a negative impact on the fishery.

FY09 awards

1. NEAMAP survey coverage RI sound.
2. Mapping of fish habitat in RI & Block Island Sound.
3. Temporal aspects of habitat utilization and interspecies competition: defining the ecological impacts of spiny dogfish in structuring ecosystem dynamics of SNE.
4. Innovative large mesh whiting trawl to reduce spiny dogfish bycatch.
5. Reduce winter flounder retention through avoidance gear in small mesh trawl fishery SNE and Mid-Atl. (large mesh panel in 1st belly).
6. Is Cape Cod a natural delineation for migratory patterns in US and Canadian dogfish stocks?
7. Testing of a low profile excluder dredge for winter flounder bycatch reduction.
8. A method to reduce winter flounder retention by minimizing variability in drop chain performance in the inshore Loligo small mesh trawl fishery off Long Island, NY within the Winter Flounder stock area.

Northeast Consortium

FY09 awards.

1. Herring sorting grid.
2. Defining Atlantic wolfish aggregations in Mass Bay.
3. Acoustic and trawl surveys to characterize Ipswich cod biomass.
4. Environmental Management System training for fishermen.
5. eMOLT VII validation of NE's coastal circulation model.
6. Is OLFISH electronic monitoring system applicable for deep water red crab fishery?
7. Evaluating practicality and economic viability of a pilot redfish jig fishery.
8. Movement and migration patterns of winter flounder.
9. Application of broadband sonar technology for fisheries assessment and research.

NCRP Research Set Aside Program Awards

Mid-Atlantic RSA Program 2008-2010

1. Data collection and analysis in support of single and multispecies stock assessments in the Mid-Atlantic: Northeast Area Monitoring and Assessment Program Near Shore Trawl Program (2008, 2009 & 2010).
2. Fishery Independent Scup Survey of Hard Bottom Areas in Southern New England Waters (2008, 2009 & 2010).
3. Discard Mortality in the Summer Flounder Fishery: A New Approach to Evaluation (2008)
4. Evaluation of Summer Flounder Discard Mortality in the Bottom Trawl Fishery Part II: A Study of the Offshore Winter Fishery (2009)
5. A method to reduce butterfish retention in the offshore directed Loligo fishery through the use of a bycatch reduction device (BRD) adapted to pre-existing gear (composite square mesh escape panels & visual stimulation) (2010)

Monkfish RSA Programs 2008-2010

1. Evaluating the Discard of Monkfish Caught as Bycatch on Northeast Multispecies DAS and Directed Monkfish Trips: An Application of the Study Fleet Electronic Logbook Program (2008)
2. Movements, Growth, and Habitat Use of Monkfish Based on Archival Tagging and Otolith Elemental Analysis (2008, 2009 & 2010)
3. Influence of Climate on the Distribution and Catch Rates of Monkfish, *Lophius americanus* (2008 & 2009)
4. An Evaluation of the Effects of Gill Net Alterations on Selectivity and Relative Efficiency in the Monkfish Fishery (2008)
5. A Weight of Evidence Approach for Validating Age & Growth in US Monkfish (*Lophius americanus*) Stocks (2009)
6. An evaluation of tiedown length in monkfish gillnets on monkfish retention and the potential uses as a bycatch reduction measure. (2010)

Scallop RSA Program 2008 - 2010

1. Sea Turtle- Scallop Fishery Interaction Study (2008 & 2009)
2. Developing Tools to Evaluate Spawning and Fertilization Dynamics (2008)
3. Characterization of Scallop Abundance and Benthic Habitat Using Optical and Acoustic Imaging Technology (2008 & 2009)
4. An Assessment of Sea Scallop Abundance and Distribution in Selected Closed Areas: Georges Bank Area II and the DelMarVA Closed Area (2008 & 2009)
5. Assessment of Sea Scallop Distribution and Abundance in Federal Waters of the Gulf of Maine (2008)
6. An Assessment of Hanging Ratio and Mesh Orientation of Twine Tops on Selectivity and Bycatch in the General Category Scallop Dredge Fishery in Scallop Limited Access Areas (2008)
7. High Resolution Video Survey of the Sea Scallop Resource, Recruitment Patterns and Habitat of the Elephant Trunk and Nantucket Lightship Closed Areas (2009)
8. Evaluation of Northwest Atlantic Ocean Continental Shelf Substrates (2009)
9. Testing of Sea Scallop Dredge Dual Mesh Size Twine Top for Bycatch Reduction (2009)
10. Continuing the Time Series: Calibrating the NMFS Sea Scallop Survey to the R/V Hugh R. Sharp (2009)
11. Scallop, Yellowtail Flounder, and Substrate Distribution in the Closed Area II Scallop Access Area and the Western Side of the Great South Channel (2010)
12. An Assessment of Sea Scallop Abundance and Distribution in Selected Closed Areas: Hudson Canyon Closed Area (2010)
13. Testing of Modifications to the Cfarm Turtle Excluder Dredge for Bycatch Reduction (2010)
14. High-Resolution Video Survey of the Sea Scallop Resource, Recruitment Patterns, and Habitat of the Hudson Canyon and Delmarva Closed Area (2010)
15. An Assessment of Sea Scallop Abundance and Distribution in Selected Closed Areas: Georges Bank Closed Area 1 (2010)
16. Real-Time Electronic Bycatch Reporting Pilot Project (2010)

Atlantic Herring RSA Program 2008 - 2010

1. Effects of Fishing on Herring Aggregations (2008)

Other National Marine Fisheries Service research award programs

NEFSC Conservation engineering projects funded under National BREP and ACL funds.

1. Gear modification research to reduce the bycatch of butterfish in the offshore Loligo squid fishery (camera behavior studies and large mesh panel BRD in net extension).
2. Assessment of the Impacts of Gear Modifications in the Monkfish Fishery on Bycatch of Atlantic Sturgeon and Harbor Porpoise.

FY10 Saltonstall-Kennedy Grant Program – Northeast Awards.

1. Understanding opportunities and barriers to increase profitability for the Gulf of Maine lobster industry.
2. Test of floating trawl bridles to reduce finfish and bycatch in the Gulf of Maine pink shrimp fishery.
3. Conduct a collaborative research study on one of Maine's 'Species of Concern' in the near-shore Gulf of Maine, cusk (*Brosme brosme*).
4. Seasonal frequency and development of Hemic Neoplasia in the soft shell clam *Mya arenaria* along the east coast of the US.
5. Development of cod aquaculture for downeast fisherman.
6. A study of the social and economic capacity of eastern Maine fishing communities: how can small-scale fishing communities participate in catch share programs?
7. Submerged culture of steelhead trout for open ocean aquaculture in the northeastern US.
8. Dismissing Dogma II: the use of satellite tags to examine the behavior of spiny dogfish (*Squalus acanthias*) in relation to habitat use, depth preference and movement patterns in the western North Atlantic.

9. Restoring Long Island's winter flounder fishery: influence of natural and anthropogenic factors on health, fitness and recruitment success.
10. Developing markets for underutilized and undervalued seafood products in the Northeast: An industry collaboration led by GMRI.
11. Socioeconomic impacts of herring fisheries management in the Northeast: Looking back to move forward.
12. Development of an oral vaccine for nodavirus infection.
13. The economic impacts of "no-fishing" zones on Stellwagen bank National Marine Sanctuary: an analysis of the small-scale ground-fishing fleet and their local coastal communities.
14. Enhancing sea scallop stocks in eastern Maine through applied aquaculture research and technology transfer.