# Program Review of New England Research Set-Aside Programs

## Final Report (Draft)

New England Fishery Management Council

**Prepared by the Research Set-Aside Review Panel**

**April 2019**

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**Acronyms**

| | |
|---|---|
| ABC | Acceptable Biological Catch |
| ACL | Annual Catch Limits |
| ACT | Annual Catch Target |
| AP | Advisory Panel |
| AM | Accountability Measurements |
| ASMFC | Atlantic States Marine Fisheries Commission/Commission |
| DAS | Day-At-Sea |
| EEZ | Exclusive Economic Zone |
| EFH | Essential Fish Habitat |
| FFO | Federal Funding Opportunity |
| FMP | Fishery Management Plan |
| GARFO | Greater Atlantic Regional Fisheries Office |
| IFM | Industry-Funded Monitoring |
| MAFMC | Mid-Atlantic Fishery Management Council |
| MSA | Magnuson-Stevens Fishery Conservation and Management Act |
| MSY | Maximum Sustainable Yield |
| NEAMAP | Northeast Area Monitoring and Assessment Program |
| NEFMC/Council | New England Fishery Management Council |
| NEFOP | Northeast Fisheries Observer Program |
| NEFSC | Northeast Fisheries Science Center |
| NFMA | Northern Fishery Management Area |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| PDT | Plan Development Team |
| RH/S | River Herring/Shad |
| RSA | Research Set-Aside |
| SARC | Stock Assessment Review Committee |
| SAW | Stock Assessment Workshop |
| SFMA | Southern Fishery Management Area |
| SSC | Scientific and Statistical Committee |
| TAL | Total Allowable Landings |

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# 1.0 OVERVIEW

## 1.1 INTRODUCTION

The New England Fishery Management Council (NEFMC) is mandated to prepare and maintain Fishery Management Plans (FMPs) as the basis for management of the fishery resources under the Council's jurisdiction. There are nine NEFMC FMPs to manage most commercial and recreational marine fisheries in New England, and as well as a cross-cutting plan to conserve Essential Fish Habitat.

Scientific information is the foundation of NEFMC FMPs. Therefore, the NEFMC has established a mechanism to enhance scientific knowledge for some of the species under its jurisdiction. Fishery Management Plans for sea scallops, Atlantic herring and monkfish authorize a portion of the acceptable biological catch (ABC) to be set aside and potentially used as compensation for scientific data collection and research. This potential compensation is referred to as a research set aside (RSA).

NEFMC RSA programs began in 1999 as an outgrowth of cooperative research surveys of sea scallops conducted by scientists of the Northeast Fisheries Center (NEFSC), academics and the fishing industry. Fishing vessels that served as platforms for the surveys were allowed to retain a specified amount of catch as compensation for their participation and to pay for observers they were required to carry on their vessels during the surveys. Following the success of RSA for sea scallops, as well as a successful cooperative research survey for monkfish, RSA programs for the monkfish and Atlantic herring fisheries were established in 2004 and 2007, respectively.
The Amendments to the FMPs for sea scallops, Atlantic herring and monkfish that established the RSA programs gave broad objectives for the programs, such as "… enhance the understanding of the sea scallop resource or contribute to the body of information on which management decisions are made" (65 CFR 52697, 2000). Such broad objectives are not particularly informative when it comes to deciding what type of projects are, or are not, appropriate for RSA support.

## 1.2 DESCRIPTION OF THE REVIEW

The magnitude of NEFMC RSA programs and their potential contributions to fishery management are the motivation for reviewing the performance of RSA programs as a matter of good program management. The Council agreed to conduct an RSA program review in 2017, but more pressing priorities delayed the beginning of the review until Spring of 2018.
The NEFMC Executive Committee established a review panel with six members (One Council member as chair, one NEFMC staff member, two Northeast Fisheries Science Center (NEFSC) members and two Greater Atlantic Regional Fisheries Office (GARFO) members). A representative of the Mid Atlantic Fishery Management Council (MAFMC) was added early in the review process (see Appendix I for the names of members). The Executive Committee provided guidance for the review in the form of 24 questions (see Appendix II) about Program Administration, Program Structure, and Results.

The Review Panel based its review on the following sources of information:

1. Knowledge and decades of experience of panel members,

2. Written documents reviewing aspects of RSA Programs,
3. Communications with the NEFMC Sea Scallop, Atlantic Herring, and Monkfish Committees, Committee Chairs and/or Advisory Panels, and the NEFMC Research Steering Committee,
4. An on-line survey of stakeholder views on NEFMC RSA Programs, and
5. Select confidential interviews with a cross section of knowledgeable individuals.

The Review Panel held multiple web conferences to plan and review its work and held a face to face meeting to draft findings and recommendations. It gave a progress report to the Council at April, June, September and December 2018 and January 2019 meetings. This report was submitted and presented to the April 2019 meeting.

The Review Panel did its best to assure that everything in its report is clear and accurate, but it did not limit its findings and recommendations to consensus views. The rationale is that a rich diversity of ideas is more valuable than a consensus that results in some ideas being suppressed.

## 1.3 HOW RESEARCH SET ASIDE PROGRAMS FUNCTION

NEFMC RSA programs are established by sea scallop, Atlantic herring and monkfish FMPs. With approval of these FMPs by the Department of Commerce, the NEFMC and the National Marine Fisheries Service (NMFS) became RSA Program partners.

The Council determines the amount of RSA for each species as part of the fishery management specification process (the process established by the FMP for adjusting aspects of management). For sea scallop and Atlantic herring, RSA is specified as an amount of catch. For monkfish, RSA is specified as the number of days at sea (DAS) set aside as compensation for research. For the 2017 fishing years (not necessarily corresponding to a calendar year), the amount of RSA, as a percentage of the annual catch limits (ACL) was 2.7% and 3% for sea scallops and Atlantic herring, respectively. For monkfish, the RSA of DAS is a small fraction of the total DAS allocated to the fishery (around 1%), but since there is a large amount of latent effort, RSA DAS used were17% of the actual DAS usage in the 2017 fishing year.

The research supported by RSA is a fraction of its first sale value. The estimated percentages for 2013-2017 by species is as follows:

| 2013-2017 | Sea Scallops | Monkfish | Atlantic Herring |
|---|---|---|---|
| Research support | 25% | 18% | 27% |

The research priorities of RSA programs are routinely revised (for example, annually for sea scallops). The draft priorities are prepared by Plan Development Teams, and they are refined by Advisory Panels and species FMP Committees before being approved by the Council as part of FMP specifications.

Based on the RSA specifications in FMPs, the NEFSC conducts a competitive grants process to award RSA fishing opportunities. It prepares announcements of opportunity based on Council approved priorities to solicit proposals. The proposals are subjected to confidential technical peer reviews and review by a management panel. Based on these reviews, and expertise of NMFS

staff, the NEFSC assembles a package of technically sound grants with management relevance that it considers a balanced response to NEFMC priorities.

In some cases, proposals are modified based on input from the review process or constraints on the amount of RSA that is available. A small number of awards are made as cooperative agreements (a form of grant) to facilitate participation of NEFSC scientists in the projects. The number of grant awards in recent years is as follows:

| Year | Sea Scallops Awards | Atlantic Herring Awards | Monkfish Awards |
|---|---|---|---|
| 2016 | 15 | 2* | 2 |
| 2017 | 17 | | 3 |
| 2018 | 15 | | |

**One of the awards was terminated in 2017 due to lack of RSA quota harvest opportunities.*

Once project awards are made, the NMFS monitors performance of the grant recipients and tracks use of RSA fishing opportunities to assure that awarded amounts are not exceeded. Meetings are held to inform Council bodies (e.g., Committees) and stakeholders about the projects that have been awarded and to promote coordination of scientific activities. The results (e.g., project reports) are distributed to appropriate entities (e.g., Plan Development Teams, NEFSC scientists preparing scientific advice on management) and the NEFSC maintains a publicly accessible archive of final project reports. In some cases (discussed below), data generated by projects is made available as soon as possible after it is collected so that it can be used almost immediately as the basis of management advice.

## 1.4 DESCRIPTION OF RESEARCH SET ASIDE PROJECTS AND OUTCOMES

Since 2000, NEFMC RSA programs have supported nearly $40 million in estimated value of research. The breakdown by species is as follows:

| 2000-2018 | Sea Scallops | Monkfish | Atlantic Herring |
|---|---|---|---|
| Research support | $34,294,297 | $4,132,206 | $822,600 |

Most of the research support is generated by sea scallop RSA. The estimated first sale value of the RSA used to generate this research is $157 million based on the proportion of RSA value that supported research during 2013-2017 (see Table above under How RSA Programs Function). Resource survey projects for sea scallops account for the largest share of RSA compensation (31% of sea scallop RSA in the period 201302017). Several sea scallop survey projects are awarded annually (8 of 15 awards in 2018). An effort is made during the process of reviewing grant applications and making awards to assure that the collection of sea scallop projects, along with NEFSC sea scallop surveys, function synergistically to fulfill needs for broad scale survey data for the entire sea scallop resources and finer spatial scale data for decisions on opening and closing areas to fishing as part of rotational area management. Data from these surveys is made available to the Plan Development Teams and NEFSC scientists in near real time (shortly after surveys are completed) so it can be used in analyses that inform annual specifications of the annual catch limit (ACL) and access to areas subject to rotational area management. There is

broad agreement that the success of rotational area management depends on rapid access to data generated by RSA survey projects.

In addition to sea scallop surveys, RSA has supported a wide range of projects on the following topics:

1. Gear research to reduce bycatch of finfish by sea scallop dredges,
2. Research to mitigate and monitor interactions between the sea scallop fishery and threatened sea turtles.
3. Research on scallop quality including potential causes of grey meats;
4. Benthic habitat mapping, etc.
5. Scallop biology and life history research.

The results of many, but not all, of these projects have been used to inform fishery management or to comply with other laws that apply to fishing (in particular, the Endangered Species Act). The inventory of RSA projects supported by Atlantic herring and monkfish RSA is much more limited (as expected considering the relative value of RSA).

In the case of Atlantic herring, there is an ongoing project on river herring bycatch mitigation (2014-present). The project conducts shoreside monitoring of the amount of river herring mixed with Atlantic herring landings. The project informs fishing vessels when and where they have an increased risk of catching river herring and potentially facing closures if the river herring catch cap is reached or exceeded. Interviewed stakeholders of the fishing industry expressed strong support for the program (i.e., it has helped the industry to "live" within the cap).

In the case of monkfish, most of RSA in recent years has been used to support a project on age, growth, and maturity of monkfish. The project results have been a useful input to the most recent benchmark stock assessment.

## 1.5 REVIEW FINDINGS AND RECOMMENDATIONS

These findings and recommendations are based on feedback received from a widely disseminated online survey, interviews with 20 individuals with broad areas of expertise and knowledge, and knowledge and experience of the RSA review panel members. Not all findings and recommendations are a consensus. Non-consensus findings and recommendations add to the rich diversity of ideas in the report.

**FINDINGS**

***Finding 1. The New England Council's Research Set Aside programs are performing well, and are generally regarded as highly successful, especially the Scallop RSA program.***

RSA programs have broad support among stakeholders, managers, and scientists and they instill a healthy sense of ownership and buy-in to science and fishery management by fishing industry stakeholders.

***Finding 2. While stakeholders support RSA, the review panel heard concerns about several aspects of the Programs.***

The concerns were about:

1. Inadequacies in priority setting processes, including concerns that there are too many priorities, priorities lack specificity, and about potential conflicts of interest by participants involved in setting priorities.
2. Perceived weaknesses and lack of transparency in proposal review processes.
3. Limited pool of RSA applicants and recipients, although RSA applicants have a good performance track record and they have access to broad expertise.
4. Awarding RSA fishing opportunities instead of monetary awards creating unique challenges for scientists and the fishing industry, such as uncertainty in the value of RSA awards, low or minimal value of monkfish and Atlantic herring RSA in some circumstances, and lack of ability or willingness of many scientists to participate because of the requirement to monetize RSA.
5. Fairness in the ways RSA fishing opportunities are used since it is entirely up to the recipients of RSA grant awards to decide who they partner with to use compensation fishing opportunities. However, flexibility in the selection of partners to conduct compensation fishing is considered a positive aspect of the RSA programs by most RSA award recipients.
6. Timeliness of RSA awards. Delayed start dates of RSA grant awards can reduce compensation fishing opportunities, and in some cases, come too late in the year for the research to be accomplished on the schedule proposed in the grant application.
7. Lack of clarity about financial oversight of grants. The concern is about the timeliness of financial reports from grant recipients, and NMFS verifying that funds generated by monetizing RSA are spent according to approved budgets. However, the review panel is not aware of any irregularities.
8. Results not feeding back into the management process as well as they could be. The concern is about some RSA projects producing results that are not particularly useful for management and other RSA project results that some think are useful, but they have not been used to date.
9. Inadequate access to data produced by RSA, and issues of ownership of data. RSA programs currently require that data be made available, but this policy has not been consistently enforced. Another concern is that some RSA projects generate huge amounts of data that are difficult and expensive to manage, store and transfer.
10. Lack of collaboration among scientists participating in RSA grants and NMFS scientists. The concern is that scientists producing RSA results and the NMFS scientists that are usually responsible for using the results to generate scientific advice may lack a shared understanding of the information needed and how it can be applied.

***Finding 3. The role of RSA is unspecified such that there does not seem to be a basis to decide what is, or is not, appropriate for support by RSA.***

There is a general understanding that RSA projects produce scientific information mostly (but not exclusively) intended to support fishery management. However, there are no explicit criteria for deciding when a project should not be supported by RSA or if it should be supported by another vehicle for funding research.

***Finding 4. Sea scallop surveys, which are the largest and most enduring RSA activity, lack an overall design, which likely does not optimize resources and scientific potential.***

Sea scallop surveys are used to support management of the sea scallop fishery, but they lack a rigorous scientific design that addresses spatial coverage, sampling design, sampling technology, sampling frequency, sampling intensity, and models for data assimilation.

***Finding 5. Implementing RSA programs generates a substantial administrative workload***. The workload associated with RSA programs is substantial. Significant time, effort and resources from NMFS and NEFMC staff, as well as technical/scientific reviewers and management review panel members, are expended prior to project selection. Administrative costs are also incurred in the meeting time budget of Council groups (i.e., PDTs, APs, Committees and the Council) that participate in priority setting. NMFS program administrators responsible for program management and project oversight have a substantial charge in ensuring RSA programs are implemented consistent with program objectives, and research results receive a rigorous technical review and project results are made available in a timely manner. NMFS also expends considerable resources monitoring RSA compensation fishing activities and processing permits to enable RSA research and compensation fishing.

***Finding 6. One or more of the current RSA programs may no longer be viable, but other species may be candidates for RSA programs in the future.***
There is no doubt about the success of the sea scallop RSA program. The RSA review panel did not come to a conclusion about the future viability of the Atlantic herring and monkfish RSA programs. The panel agreed that the long duration of monkfish and herring RSA programs is not enough of a reason to continue them. In this regard, the fact that RSA has not been used to address information needs for most species managed under NEFMC FMPs should not inhibit applying RSA to these species in the future.

## RECOMMENDATIONS

To address findings, the Review Panel has six primary recommendations (with numerous subordinate suggestions).

***Recommendation 1. When it comes to making changes in NEFMC RSA programs, caution should be exercised not to "screw up a good thing."*** This recommendation is an acknowledgment of the success of RSA. The RSA review panel's warning to be cautious is especially related to the broad stakeholder support enjoyed by today's RSA programs.

***Recommendation 2. Several ideas for improving RSA programs that emerged during this review should be considered by the NEFMC and NMFS.*** The ideas concern:

1. Inadequacies in priority setting processes: The NEFMC should consider investing more time and resources, having PDTs working with NEFSC to draft language for each priority, having an outside group review RSA priorities, explicitly budgeting RSA fishing opportunities by topic rather than ranking priorities and relying on the current review process to attain balance, aligning RSA topics with an RSA mission statement, and maintaining and routinely reviewing records of all stakeholder input.
2. Perceived weaknesses and lack of transparency in review processes: Since the review panel generally found that review processes are well done, better communications are the appropriate way to address this concern.

3. The limited pool of RSA applicants and recipients: NEFMC and NMFS could expand efforts to highlight opportunities (e.g., by using the Sea Grant network).
4. The unique challenges created by awarding RSA fishing opportunities instead of monetary awards: Several ideas to reduce uncertainty and increase the value of RSA are suggested.
5. Fairness concerns in the ways RSA fishing opportunities are used: As a first step to address this concern, the Council should make it clear if equitable access to RSA fishing opportunities is a Council priority for RSA programs. Several additional ideas to address fairness are suggested. However, RSA grant recipients emphasized the need for flexibility when deciding which vessels would be involved in their project.
6. Timeliness of RSA awards: NMFS and NEFMC should prepare a detailed time table for the steps from priority setting to awarding RSA grants, and make adjustments as needed to ensure award timeliness.
7. Lack of clarity about financial oversight of grants: While the RSA review panel is not aware of any financial irregularities, NMFS should conduct an internal audit of its financial oversight procedures and strengthen them as appropriate.
8. Results are not feeding back into the management process as well as they could be: Several suggestions are made to encourage the application of RSA results to management.
9. Data generated by RSA funded projects have not always been made available to the public in a timely fashion: Some ideas to enhance data availability are to clarify the data sharing policy, build in the costs of data management in project proposals, or develop an annual report summarizing the status of RSA projects.
10. Lack of collaboration among scientists participating in RSA grants and NMFS scientists: More use of cooperative agreements could enhance collaboration by including NMFS scientists. The idea of a Cooperative Agreement for Research Set Aside Programs described under recommendation 4 would be a specific application of this approach.

***Recommendation 3. To clarify the role of RSA, the NEFMC should adopt a mission statement for RSA.*** The Council and NMFS should work together to establish a mission statement that best represents the role of RSA. The RSA review panel does not have a consensus recommendation on the content of a mission statement, but it might include: Fulfilling gaps in scientific information to support NEFMC FMPs when information needs are beyond the scope of NMFS' traditional role, instilling confidence and a sense of ownership in scientific information and fishery management, and fostering cooperation and collaboration between the fishing industry and scientists, including NMFS scientists.

***Recommendation 4. A series of options for improving the efficiency and effectiveness of resource surveys for scallops should be considered***. These options include:

1. ***Improvements that can be made within the general scope of the current RSA approach***, such as hold meetings to coordinate surveys, expanding the role of the scallop technical review panel that is comprised of NMFS and non-NMFS survey and survey design experts, issuing multi-year grants (up to 5 years) with a modified approach to ensure inter-annual flexibility in survey coverage.
2. ***Re-establishing the Scallop Survey Advisory Panel with the primary charge of designing an overall strategic approach for sea scallop surveys.*** With heightened

attention focused on the efficiency of sea scallop resource surveys, such an advisory panel might be more effective.

3. ***Using an RSA supported cooperative agreement to prepare a statistically rigorous (i.e., model based) design for Sea Scallop Surveys.*** A cooperative agreement is proposed as a financial instrument to support a sea scallop survey design study because it is a way of engaging both NMFS scientists and independent scientists in the study. It is essential that both are fully engaged and share ownership of the results if they are to be broadly credible and applied.
4. ***Use a relatively long term cooperative agreement to design and implement Sea Scallop Surveys***. Solicitation for a cooperative agreement RSA grant award to prepare a statistically rigorous (model based) design for sea scallop survey and implement them in cooperation with the NEFSC.
5. ***Establish a long term Cooperative Agreement for Research Set Aside Programs (CARSAP).*** A cooperative agreement RSA grant award could establish a flexible long term arrangement for NMFS scientists to collaborate with non-government scientists and stakeholders to address a broad range of scientific topics that fit the mission statement for RSA programs. This approach could address several of the concerns under Finding 2, Finding 4, and Finding 5 on the RSA workload.

There is no consensus on these five options, and the order they are listed does not indicate priority or preference.

***Recommendation 5. NMFS, in consultation with the Council, should evaluate and document RSA program administrative capacity to determine where support is sufficient and where it could or should be increased.*** Much time and effort are spent on selecting a awarding RSA project through the competitive RSA grants process. Once awarded additional time is spent on monitoring various aspects of the project and distributing research results to appropriate end users. It is recommended that the operational efficiency of the program be undertaken. Areas of focus should include grant competition administration, compensation fishing and research permitting administration and oversight, pre and post award programmatic and fiscal oversight, access to project data and results, and outreach.

***Recommendation 6. The NEFMC should consider preparing an Omnibus FMP for Research Set Aside Programs that would be available for all fisheries under the jurisdiction of the Council.*** The Omnibus Plan could include codification of the role of RSA and principles to guide the application of RSA, processes to be used for implementation, and a flexible procedure for deciding when and how much catch should be allocated to RSA projects for any FMP as needs and opportunities arise. Preparation of an omnibus RSA FMP would assure broad, transparent participation in shaping the future of RSA in consideration of this report.

# 2.0 INTRODUCTION

## 2.1 WHAT IS RSA

Fishery management plans for sea scallops, Atlantic herring, and monkfish authorize setting aside a portion of the Acceptable Biological Catch (ABC) as potential compensation for conducting research. The amount that is set aside is known as the Research Set-Aside or RSA, and the programs that manage use of RSA (e.g., who uses it and what they are obligated to do in return for the compensation) are known as RSA programs. What is referred to as research, is actually a broader set of activities that produce scientific information.

The New England Fishery Management Council's (NEFMC) RSA programs are unique. There are other fisheries where a portion of the allowable or acceptable catch is set aside for research purposes, but it is usually used to account for mortality of managed species caused by the research, not as a form of compensation to pay for research. A similar program was established by an FMP to compensate for research on species under the jurisdiction of the Mid Atlantic Fishery Management Council, but it is no longer active.

There are many fisheries in the USA and worldwide where participants in the fisheries pay a portion of the cost of managing the fisheries, including costs of research and scientific information. Payments may be made directly to entities to perform a service as part of the fishery management system (such as observer companies) or to the management entity (e.g., NMFS). This approach to funding some of the cost of fisheries management is commonly known as cost recovery, and cost recovery payments to the management entity are known as user fees.

RSA programs on the other hand do not involve monetary transactions between the fishing industry and the federal government; therefore, they are not the same as a user fee or cost recovery program. However, RSA programs are analogous to cost recovery when they are used to generate information that is desired to support fishery management. Arguably, RSA projects that directly support fishery management may be considered akin to a user fee because RSA is indirectly paid by all users of the resource, to the extent that some members of the fishing industry forego economic benefits by setting aside catch as compensation for research. Each FMP with an RSA program has determined that the collective benefits of setting aside a relatively small portion of the total allowable catch to support research outweigh the costs of slightly reduced allocations to fishery participants.

## 2.2 HISTORY OF RSA

NEFMC RSA programs began in 1999 as an outgrowth of cooperative research surveys of sea scallops by scientists of the Northeast Fisheries Science Center (NEFSC), academics and the fishing industry. Fishing vessels that served as platforms for the surveys were allowed to retain a specified amount of catch as compensation for their participation and to pay for scientific personnel that collected survey data. Following the success of RSA for sea scallops, as well as a successful cooperative research survey for monkfish, RSA programs for the monkfish and Atlantic herring fisheries were established in 2004 and 2007, respectively.

In developing the RSA programs, the specific intent of the Councils was to fund high priority research not covered by State or Federal funding to support the operation, monitoring, and/or development of the designated fishery management plans. Management for the RSA programs

was provided by the National Marine Fisheries Services' Northeast Regional Office (NERO) from 2000-2006, when responsibility for the programs shifted to NMFS' Northeast Fisheries Science Center (NEFSC).

## 2.3 POTENTIAL ROLES OF RSA

Conducting and managing fisheries requires many types of information and there are multiple ways of paying for it. In considering the role of NEFMC Research Set-Aside Programs, it is useful to consider the evolution in interest in scientific information and how it has been paid for in the past. This section of the RSA review panel's report is based on a more expansive discussion of the evolution of fisheries science and who pays for it in Appendix IX. The Appendix was prepared solely by the review panel chair and it should not be taken to represent any other panel members' views.

For millennia, fishing people, as individuals or collectively, produced the information needed to make fishing successful. One or two centuries ago, governments established large scientific programs to help develop fishing industries, but these programs have been substantially downsized or eliminated during the most recent few decades, in part as a result of Magnuson Stevens Act priorities. Scientific programs to address the MSA have grown exponentially. Since the beginning of government fisheries programs (e.g., the US Fish Commission established in 1876), research on the biology and ecology of fishes has been a mainstay, and ecosystem research continues as an important part of government programs today. Data on fisheries performance (e.g., amount landed or sold) have been collected in New England for about a century or so. Presumably, such data was collected as part of government interest in industrial output (i.e., be it agriculture, steel, automobiles, etc.), but data collection has expanded rapidly in the last few decades to support fishery management. With this expansion in collection of data about fisheries (referred to as "fishery dependent" data), some of the cost of collecting fishery dependent data has shifted from the government to the fishing industry. In New England, industry responsibility for paying for the collection of some fishery dependent data is based on provisions of Fishery Management Plans (FMP).

In addition to FMP provisions that expand fishery dependent data collection, implementation of FMPs may rely on scientific information that would not be collected otherwise (absent the FMPs). Arguably, the sea scallop FMP's rotational area management approach relies heavily on finer spatial and temporal scale distribution data than is needed for stock assessments and conservation measure for the stock overall.

The fishing industry also makes voluntary investments in scientific activities that support fishery management plan decisions. Notable, the fishing industry has sometimes funded data collection and scientists to contribute to the stock assessments that are the basis of conservation constraints. Some of these industry investments in scientific processes have been aimed at alternative or competing science that would result in more catch. More recently, industry and government have tended to invest in cooperative research involving industry, and government and non-government scientists, to make scientific advice more reliable, regardless of the impact on catch.

In addition to the evolution in NMFS's scientific programs emanating from the MSA, the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) have driven substantial

change in research priorities. The species that are the subjects of the Acts are referred to as protected species and programs that address the Acts are referred to as Protected Resources programs. The Acts' require scientific information on (1) status of protected species and (2) interactions between protected species and the fishing industry, and how to mitigate them. Most of the cost of this information has been borne by the NMFS to date.

The New England Fishery Management Council's Research Set-Aside (RSA) programs became an option for paying for some research and scientific information beginning in 2000 when the sea scallop program was established. Since its inception, RSA has been used as a funding mechanism to obtain a wide range of scientific information across the spectrum discussed above. In part, this probably reflects the broad descriptions of the purpose or role of RSA in the FMPs that established RSA programs.

Table 1 below is an attempt to summarize the discussion above. Its purpose is to focus future NEFMC deliberations on the role of RSA programs, as recommended later in this report. Appendix IX might also be consulted as background for a discussion of the role of RSA programs.

**Table 1. Types of information related to fisheries and how it has been funded in recent years. Question marks (?) are entered in some cells because the role of activities funded by some funding sources is unclear or debatable.**

| Roles of Research and Scientific Information | Source of Funding | | |
|---|---|---|---|
| | **Government** | **Industry** | **RSA** |
| **Fishery Development**: to make fisheries more efficient and valuable in terms of when and where fishing occurs, fishing methods, processing, and marketing. | X | X | X |
| **Resource Conservation:** to conserve fishery resources through stock assessments that advice on stock status and catch limits to prevent overfishing and/or rebuild fisheries | X | X | X |
| **Alternative Science:** to create alternative or competing scientific advice that will allow more catch. | | X | X |

| | | | |
|---|---|---|---|
| **Cooperative Research:** coordination between fishing industry, government and academics to improve the reliability and credibility of scientific advice regardless of the interests of the partners in the cooperation. | **X** | **X** | **X** |
| **FMP Implementation:** to produce information that is needed to fulfill provisions of an FMP, that is beyond the needs for resource conservation. | **X** | **X** | **X** |
| **Protected Species Science:** to produce scientific information to inform or fulfill requirements of the MMPA and ESA. See sub-categories below. | **X** | **?** | **X** |
| **Resource Status Determination:** to produce information on the status of species protected by the MMPA and/or ESA. | **X** | | **X** |
| **Impact Mitigation:** to describe and characterize interactions between fisheries and protected species, and how to mitigate them. | **X** | **?** | **X** |
| **Investment in Ecosystem Knowledge:** to produce knowledge about the marine and coastal ecosystems where fisheries occur as an investment in the future scientific basis for fulfilling mandates related to fisheries. | **X** | | **X** |

## 2.4 REASONS FOR REVIEWING THE RSA PROGRAM

The NEFMC endorsed its Executive Committee's recommendation to conduct a review of the Council's RSA programs in 2017. The review was delayed until 2018 due to a heavy workload and competing priorities.

The premise for the review is that NEFMC RSA Programs are valuable and they have been broadly successful, but the NEFMC wants to assure they are as good as it can be. The size of the investment in research (particularly from the Scallop RSA Program) merits routine review. This is consistent with NOAA Fisheries' program review policy which requires regular reviews of scientific programs. The fact that the Programs are funded with "fish," does not lessen the importance of being prudent in expenditures for research. Use of a public resource should

receive the same scrutiny as spending government appropriated funds or the fishing industry's money.

The decision to conduct a review was at least partially motivated by concerns that have been expressed by some Council members, applicants and participants in RSA Programs, government officials and stakeholders. These concerns are addressed in this review.

## 2.5 REVIEW METHODOLOGY

The review was initiated by the NEFMC Executive Committee. It was decided that the review would be conducted by representatives of the Council Staff, NEFSC, and GARFO, with a Council Member as chair. Later, an observer from the Mid Atlantic Fishery Management Council (MAFMC) staff was added. Presumably, the Executive Committee felt that it is more valuable to have the review include people with detailed knowledge of RSA Programs based on their involvement in the administration of the Programs rather than independent reviewers. The members of the review panel are given in Appendix I.

The Executive Committee's guidance for the review is given in Appendix II in the form of about 25 questions about RSA Programs. They are divided into three categories:

1. Program Administration
2. Program Structure
3. Results

Based on this guidance, the RSA Review Panel developed a report outline. The Executive Committee initially called for the review to be completed in time for the NEFMC's June 2018 meeting, but it quickly became apparent that this time frame was unrealistic. The revised deadline for completion is the NEFMC's April 2019 meeting.

The RSA Review Panel based its review on the following sources of information:

1. Knowledge of NEFMC and MAFMC RSA Programs based on first-hand experience interacting (in some cases managing and administering) the Programs.
2. Written documents reviewing aspects of RSA Programs including National Marine Fisheries Service policies and that apply to administration of the Programs.
3. Communications with the NEFMC Scallop, Herring, and Monkfish Committees, Committee Chairs and/or Advisory Panels, and the Research Steering Committee, about RSA Programs.
4. An on-line survey of stakeholder views on NEFMC RSA Programs. The survey was available during the period August 15, 2018 - September 17, 2018. The Survey is given in Appendix III along with a summary of results.
5. Select confidential interviews with a cross section of individuals with knowledge of NEFMC RSA Programs. Over 20 interviews were conducted between October 24 and November 14, 2018. A broad set of "trigger questions" was used to structure the interview process. The trigger questions are given in Appendix III.

The RSA Review Panel held over a dozen web conferences to plan its work and review progress. It held a face to face meeting November 28-29, 2018 to draft findings and recommendations based on all of the information it had gathered.

The NEFMC was given a progress report on the RSA Review at its April, June, September and December 2018 and January 2019 meetings. The Final Draft of this report was submitted and presented to the April 16-18, 2019 meeting of the NEFMC. The report was finalized after the meeting taking account of any feedback about inaccuracies, logical inconsistencies, or lack of clarity. However, the substance of the report is solely a product of the RSA Review Panel.

### 2.5.1 Summary of online survey results of stakeholder views on NEFMC RSA Programs

The RSA Review Panel designed a survey to elicit feedback from stakeholders on the NEFMC RSA programs for scallops, Atlantic herring, and monkfish. The purpose of the survey was to better understand perceptions of RSA performance among the various stakeholders, administrators and other interested parties who work with RSA. The survey was distributed online and potential respondents were notified by email and sent a link to the survey. The survey consisted of 42 total questions and contained both pre-defined and open-ended type response options. The survey had eight sections, each concerned with a different aspect of the RSA program. The sections were: 1) General RSA Feedback, 2) RSA Priority Setting, 3) RSA Proposal Solicitation, 4) RSA Proposal Review, 5) RSA Proposal Selection, 6) RSA Science and Research, 7) Monetizing RSA Awards, and 8) Closing Thoughts.

The survey went live on August 15, 2018 and closed on September 17, 2018. There were 55 total respondents. Respondents to the survey represented a broad range of interested parties. These included members of the Mid Atlantic and New England Fisheries Management Council, members of Advisory Panels, Plan Development Teams, non-governmental organizations and other committees, as well as RSA grant applicants, recipients, fishermen and NOAA Fisheries employees (Table 1).

Although most respondents were supportive of the RSA program in general, responses were variable and depended to some degree on program familiarity and affiliation. The most consistently positive responses came from those familiar with the scallop program and the least consistently positive responses came from those familiar with the herring program. Similarly the "users" of RSA (council members, PDT and NOAA employees) were more positive about RSA and "clients" (applicants, recipients and fishing industry interests) were less positive. Detailed results and discussion are available in Appendix III.

**Table 1. Survey respondents by affiliation ("Clients" are RSA applicants, RSA recipients and fishermen, while "Users" are MAFMC, NEFMC, PDT or NOAA affiliates) and the FMP they are most familiar with.**

| | FMP | | |
|---|---|---|---|
| Affiliation | Scallop | Herring | Monkfish |
| NEFMC Member | 6 | 5 | 5 |
| MAFMC Member | 2 | 1 | 1 |

| | | | |
|---|---|---|---|
| Committee Member | 11 | 10 | 8 |
| Advisory Panel Member | 9 | 7 | 4 |
| Plan Development Team Member | 9 | 4 | 5 |
| NOAA Fisheries staff | 6 | 5 | 5 |
| RSA grant recipient | 12 | 11 | 5 |
| RSA grant applicant | 12 | 9 | 5 |
| Fisherman or fishing industry representative | 8 | 10 | 2 |
| Non-government organization | 7 | 6 | 3 |
| Client | 20 | 20 | 7 |
| User | 22 | 15 | 16 |

### 2.5.2 Summary of confidential interviews with participants in NEFMC RSA Programs

In addition to the online survey that was available for any stakeholder to complete and provide input, the review panel decided to also conduct more detailed interviews with specific individuals that have been intimately involved in the RSA process at one time or another. Efforts were made to interview a wide spectrum of participants including: both successful and unsuccessful applicants from all three RSA programs, industry members that have directly participated as project collaborators, participated in compensation fishing, or been involved in the overall management process as an industry stakeholder, several active Council members and staff from all three FMPs, as well as a few individuals with experience with Mid-Atlantic RSA programs. Less than half of the 20+ individuals interviewed also completed the online survey.

Over 20 individual interviews were conducted over about three weeks in late October through mid-November 2018. For the most part, at least three RSA review panel members participated in each interview. In advance of the interview, participants were emailed a document with overall guidance for the interview and potential discussion topics. However, participants were invited to talk about whatever topics they wanted to share with the panel. As described in the guidance document, the main goal of the interviews was for participants to share any strengths and/or weaknesses they have experienced with the RSA programs, and to provide any specific ideas for potential improvements to any or all of the RSA programs. The majority of participants followed the topics provided, which included: 1) role of RSA; 2) RSA priorities; 3) process used for solicitation of proposals; 4) proposal review process; 5) implications of projects being funded with "fish" not dollars; 6) project oversight; 7) permitting process including Exempted Fishing Permits; 8) outcomes or application of RSA results; 9) size of the RSA programs; and 10) overall performance of RSA programs.

Interview duration ranged between 1-1.5 hours, with some extending even longer. Most participants were very prepared with responses ready. This overall process was very informative for the RSA Review Panel and provided a useful opportunity to better understand the range of experiences individuals have had with RSA programs.

# 3.0 DESCRIPTION OF RSA PROGRAMS BY FISHERY MANAGEMENT PLAN (FMP)

## 3.1 BRIEF DESCRIPTION OF FISHERIES AND HOW THEY ARE MANAGED

### 3.1.1 Scallop FMP

The Council established the Atlantic Sea Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan. Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access program to stop the influx of new vessels, and a day-at-sea (DAS) reduction plan to reduce mortality and prevent recruitment overfishing. Limited access vessels were assigned different DAS limits according to which permit category they qualified for: full-time, part-time or occasional. Amendment 4 also created the general category scallop permit for vessels that did not qualify for a limited access permit. Although originally created for an incidental catch of scallops in other fisheries, and for small-scale directed fisheries, the general category fishery and fleet has evolved since its creation in 1994.

In 2004, Amendment 10 to the Scallop FMP formally introduced rotational area management and changed the way that the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited vessels to fish in any area, vessels had to use a portion of their total DAS allocation in the controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. The amendment also adopted several alternatives to minimize impacts on essential fish habitat (EFH), including designating EFH closed areas, which included portions of groundfish mortality closed areas.

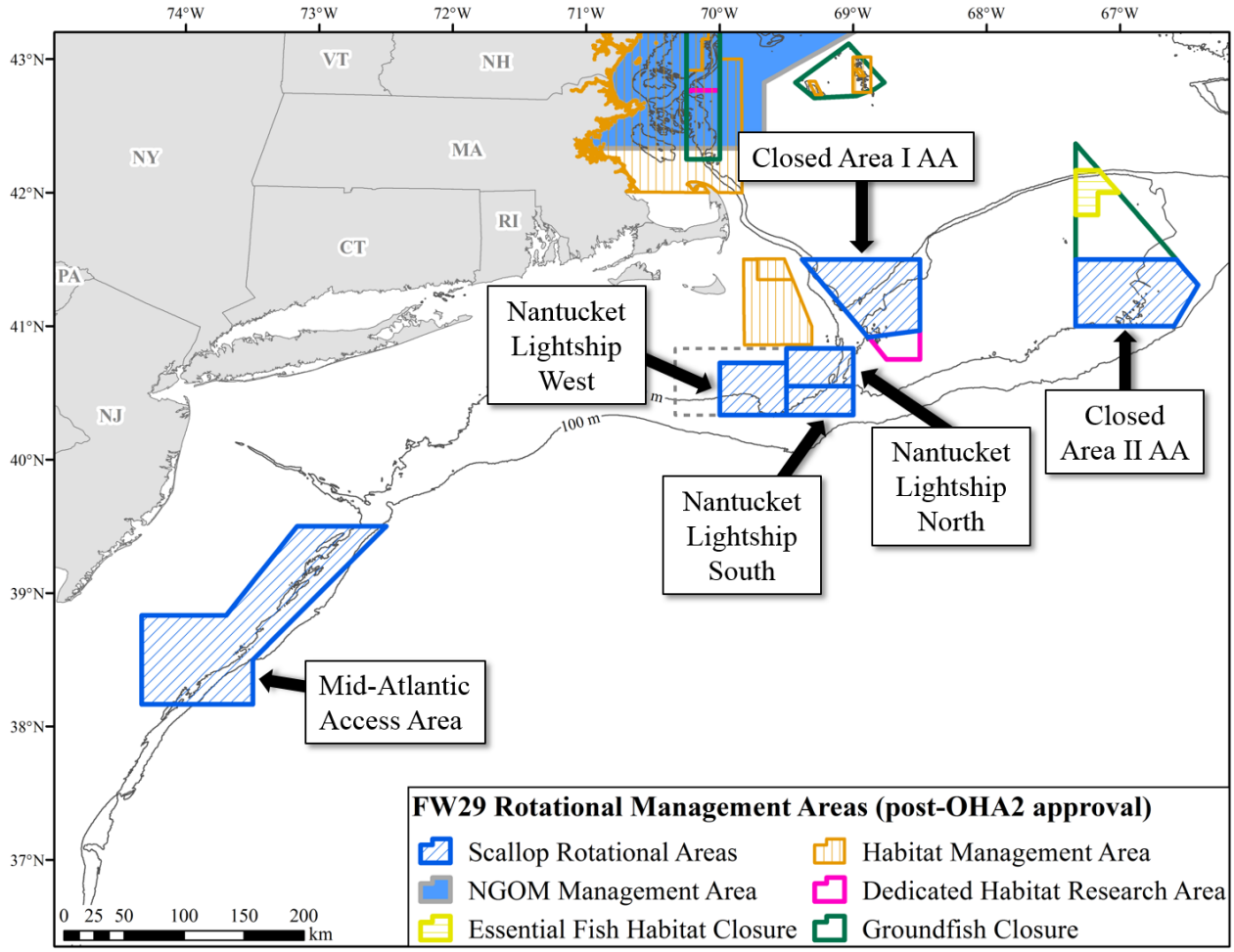
In 2011, Amendment 15 to the Scallop FMP brought the FMP in compliance with new requirements of the re-authorized MSA (namely ACLs and Accountability Measurements (AM) as well as a handful of other measures to improve the overall effectiveness of the FMP.

The scallop resource has recovered from a period in 1980s-1990s when the stock size was very low following high catch levels by foreign vessels operating in the United States Exclusive Economic Zone (EEZ). Fishery allocations are developed using a projection model (SAMS) developed at the NEFSC, which projects exploitable biomass for the following year based on available survey information.

Although all sea scallops in the US EEZ are managed as a single stock, assessments consider the resource by the two main regions where scallops occur and where the fishery operates: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock. Based on the recent 2018 assessment, scallop biomass is higher than previously estimated, the stock is not overfished, and overfishing is not occurring. Overall biomass and abundance have increased in recent years following exceptionally strong year classes observed in 2012 and 2013.
Other species are caught incidentally during the prosecution of the scallop fishery. The species composition varies by area, but some of the species caught include: yellowtail flounder, windowpane flounder, skates, and monkfish. The scallop fishery has been allocated sub-ACLs for Georges Bank yellowtail flounder, Southern New England/Mid-Atlantic yellowtail flounder, Southern windowpane flounder, and Northern windowpane flounder, and is subject to

accountability measures if catch thresholds of these stocks are exceeded (i.e. required to use a modified dredge).

**Figure 1. Scallop rotational management areas (in hatched blue) being considered in this action, Framework 29, with respect to EFH closures (in striped yellow), groundfish closures (green outlines), habitat management areas (orange barred), and dedicated habitat research areas (pink outline). Note that this figure reflects the parts of OHA2 that were approved by NMFS on Jan. 3, 2018.**




### 3.1.2 Herring FMP

Atlantic herring fishing was predominantly managed under the Atlantic States Marine Fisheries Commission (ASMFC) in the 1980s and 1990s, primarily using spawning closures. As the fishery grew the Council began developing an FMP that was effective in January 2001. In recognition of the spatial structure of the Atlantic herring stock complex (multiple stock components that separate to spawn and mix during other times of the year), the total annual catch limit for Atlantic herring (stock wide ACL) is divided and assigned as sub-ACLs to four management areas (Figure 2). Management Area 1 represents the Gulf of Maine, which is divided into an inshore (Area 1A) and offshore section (Area 1B). Area 2 is located in the coastal

waters between MA and NC (southern New England/Mid-Atlantic), and Area 3 represents the offshore Georges Bank area.

Fishing occurs over portions of the continental shelf from Maine to Cape Hatteras, North Carolina. The herring fishery uses predominantly single and paired mid-water trawl, bottom trawl, purse seine, and to a lesser extent, gillnet gear throughout the entire range. In the U.S. herring is primarily used as bait for the American lobster and tuna fisheries but is also frozen whole and canned for human consumption.

The fishery generally follows the migration of the herring resource. From December to March, the fleet mostly operates in the waters of southern New England, vessels often target Atlantic mackerel during that time of year as well. In summer/early fall, most fishing is in the inshore Gulf of Maine (coastal waters of ME, NH, and MA), Georges Bank, and an area east of Nantucket Shoals. Spawning occurs in the summer and fall, starting earlier along the eastern Maine coast, and later in the fall in southwestern Gulf of Maine and Georges Bank.

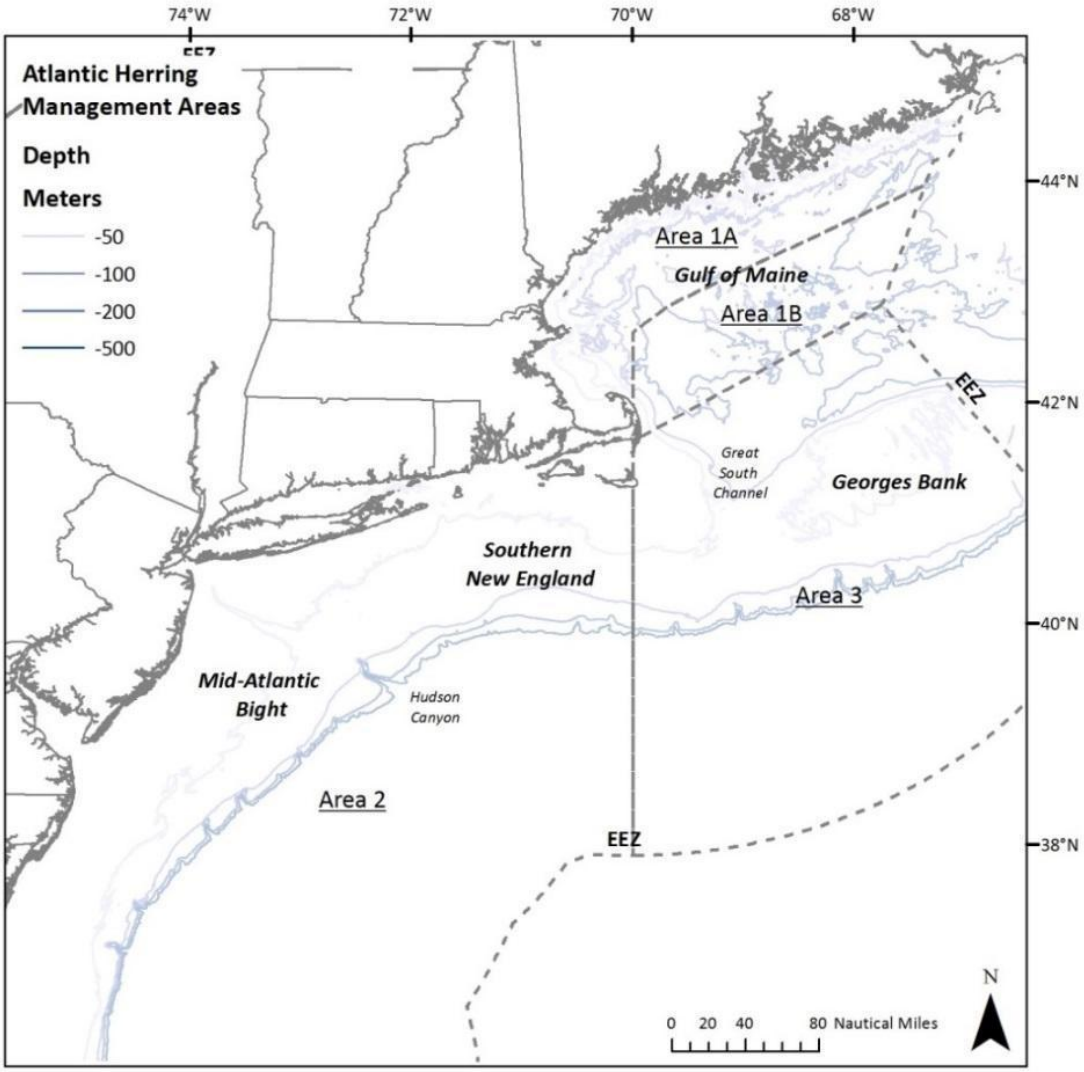
The FMP includes a limited entry program that was established in 2006 under Amendment 1, controlling the number of vessels that can participate in the fishery. There are several different limited access permit categories with about 100 vessels, but less than half are actively fishing for herring. Total U.S. herring landings have been relatively stable since the FMP was implemented, above or below 100,000 with one dip under 70,000 mt in 2010, and again recently in 2016 and 2017. Total revenues for this fishery peaked in 2013 at about $30 million and has been above $20 million per year since 2011. The average price of herring has increased substantially in recent years, almost doubling in the last ten years from about $240 per mt in 2007 to about $425 in 2016 (NEFMC, 2018).

The herring resource has generally been in good condition over the years except for the late 1970s-1980s when the stock size was very low following high catch levels when foreign vessels were operating in the area. The herring biomass is assessed using an ASAP model developed at the NEFSC, the age structured assessment program was first used in the 2012 benchmark assessment, the 2015 update assessment, and most recently in the 2018 benchmark, including several modifications to the 2012 version. Based on the recent assessment, herring biomass is lower than previously estimated, the stock is not overfished, and overfishing is not occurring. However, recruitment has been below average since 2013; therefore, if the estimated record low recruitment in recent years hold true, then biomass is likely to remain relatively low and put the stock at relatively high risk of becoming overfished. Catch limits are expected to decrease in the near term to prevent overfishing.

Other species are caught incidentally in the directed herring fishery. The species composition varies based on gear type, year, season, and area, but some of the species caught include: Atlantic mackerel, haddock, river herring (alewife and blueback herring), shad (American shad and hickory shad), whiting, and spiny dogfish. Due to the high-volume nature of the Atlantic herring fishery, non-target species are often retained once the fish are brought on board and sometimes sold as part of the overall catch if they are not separated. The herring fishery has been allocated a sub-ACL of Georges Bank haddock, and there are also bycatch caps for river herring/shad. The herring fishery is subject to accountability measures for both caps and

directed herring fishing is prohibited in specific areas for the remainder of the fishing year when 95% of a bycatch cap is estimated to be caught. Learning more about bycatch interactions and minimizing the impacts of the herring fishery on bycatch have been a large component of the RSA program to date, in terms of the awards made.

**Figure 2. Atlantic Herring Fishery Management Areas**




### 3.1.3 Monkfish FMP

The Monkfish FMP was initially implemented in 1999, and has been modified several times, most recently in 2011 with the implementation of Amendment 5 and FW 10 in 2017. The

documents pertaining to previous management actions are available on the NEFMC website, www.nefmc.org.

For management purposes, the monkfish fishery is divided into two areas; the Northern Fishery Management Area (NFMA) and the Southern Fishery Management Area (SFMA; see Figure 3). While scientific evidence for two biological stocks is uncertain, and additional research, including archival tagging, is ongoing, fisheries in the two areas are clearly distinct. As a result, stock assessments are completed for the two areas separately to be able to support the management plan. The NFMA monkfish fishery is closely integrated with the multispecies fishery, and is primarily a trawl fishery, while the SFMA fishery is primarily a gillnet fishery targeting monkfish almost exclusively. These differences have resulted in some differences in management measures, such as landing limits and effort allocations, between the two areas.

The monkfish fishery is managed primarily with a days-at-sea (DAS) management system with corresponding trip limits per DAS. The monkfish fishery is jointly managed by the New England and Mid-Atlantic Fishery Management Councils. The fishing year extends from May 1 to April 30. The range for the monkfish fishery is the EEZ north of the North Carolina/South Carolina border. However, there are two separate management areas, the Northern (NFMA) and Southern (SFMA) Fishery Management Areas based on different fishing activity between the two areas. For commercial vessels, these management areas have different possession limits and regulatory requirements. There are seven categories of monkfish permits (A, B, C, D, E, F, and H); trip limits can vary with permit types as outlined at https://www.greateratlantic.fisheries.noaa.gov/sustainable/species/monkfish/index.html.

The Monkfish FMP requires the annual catch limit (ACL), annual catch target (ACT), total allowable landings (TAL), and effort controls (DAS and trip limits) to be specified every three years. The 2007 Northeast Data Poor Stocks Working Group and the 2013 operational assessment used the SCALE model (Statistical Catch-at-Length Analysis) to estimate fishing mortality, recruitment, and stock biomass. But updated analyses found that the growth curves previously used in the SCALE model were inaccurate; therefore, a survey index-based methodology for developing catch advice was later deemed appropriate (Richards, 2016). The 2016 operational assessment indicated the specifications for the NFMA could slightly increase, while the specifications for the SFMA could slightly decrease. The SSC approved status quo specifications for FYs 2017 – 2019. Five hundred Monkfish DAS are set aside annually from the total monkfish DAS allocated to limited access vessels for the RSA program. The DAS allocations to limited access vessels are reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. In 2015, there were 600 monkfish limited access permits (NEFMC, 2017). Award recipients are provided with a weight equivalent for their allocated RSA DAS, which is calculated by setting each RSA DAS to be equal to double the possession limit for vessels with permit categories A and C fishing in the SFMA. Projects are constrained to the total DAS, maximum landing weight, or EFP expiration date, whichever is reached first.

Landings in both areas combined peaked in FY 2003 but have since declined to reach a relatively stable level between FY2011 – 2014. FY 2015 landings showed a slight increase in landings in the NFMA and a slight decrease in the SFMA, however, it is not clear yet whether this represents a new trend. Table 1 is based on fishing year and landed weights and indicates that the trend in

revenues and landings has stabilized in recent years. Figure 4 shows the long-term trend in landings and revenues based on a fishing year. While landings have declined since the pre-FMP peak in 1997, nominal revenues have declined to a lesser degree since that time. According to Table 1, the monkfish market fluctuates annually with periods of increasing and decreasing landings leading to both revenues increases and decreases.

There is a substantial amount of latent effort in the fishery; only a portion of the limited access vessels used at least one monkfish DAS in FY 2015, and the total DAS used by limited access (permit category C and D) vessels was only about 10% of the total allocated. Only about 43% of allocated DAS were used by active vessels across all permit categories in FY2015. Part of this latent effort can be explained by the fact that nearly one-half of the permit category C vessels, 161 vessels, are limited access scallop vessels who choose not to use a scallop DAS to target monkfish under the monkfish DAS usage requirements because of the greater profitability of using scallop DAS to target scallops.

**Figure 3 – Monkfish fishery management areas and statistical areas.**

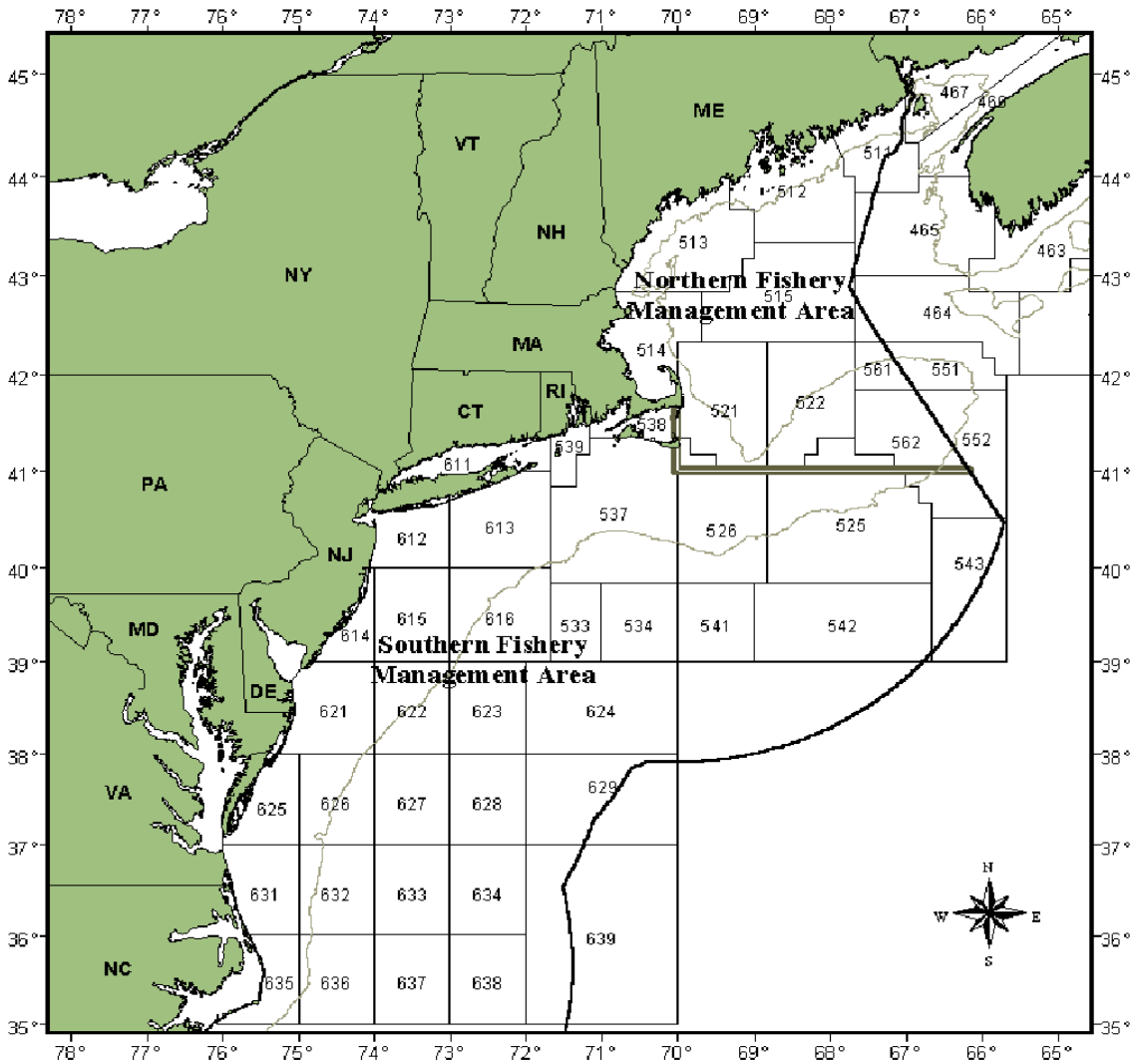
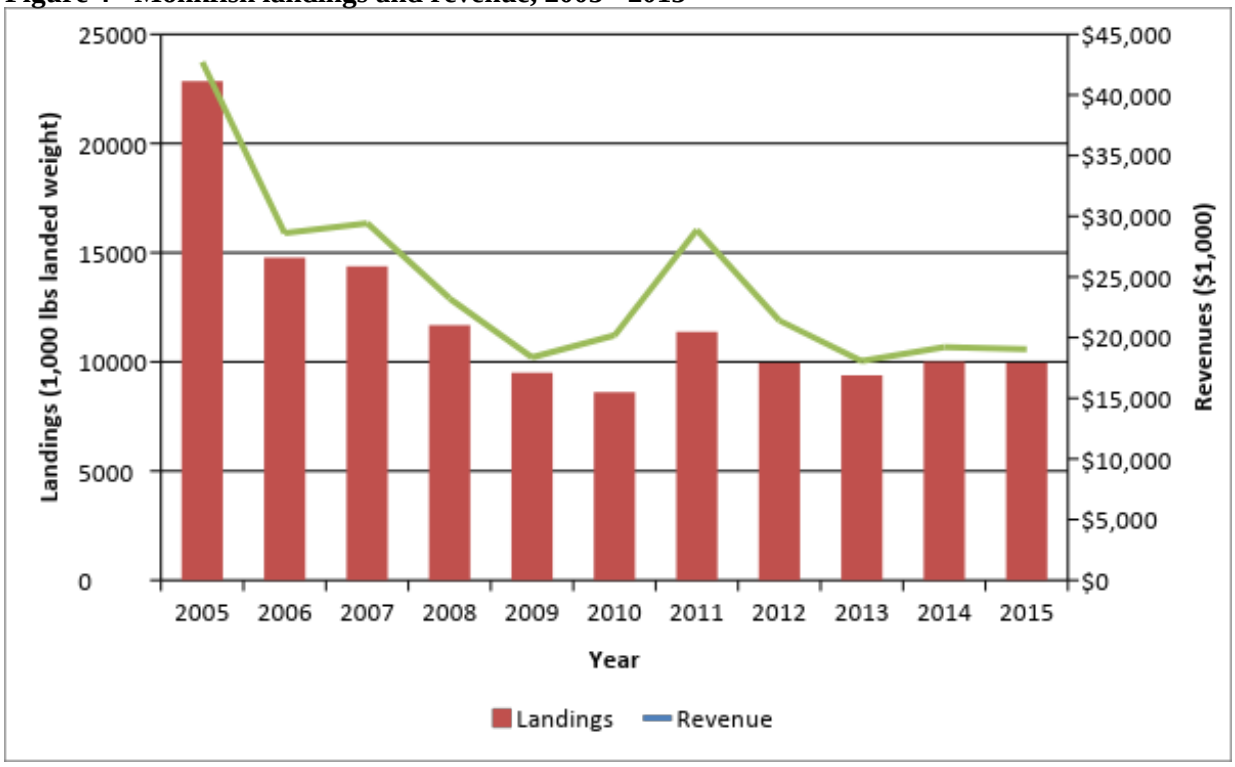


**Table 1 - Total monkfish landings (landed weight) and revenues, 1995-2015**

| Fishing Year | Landings* | Revenues* |
|---|---|---|
| (May 1 - April 30) | (1,000 lbs. landed wt.) | ($1,000) |
| **1995** | 18,416 | $24,759 |
| **1996** | 20,733 | $26,188 |
| **1997** | 21,774 | $30,127 |
| **1998** | 24,156 | $34,682 |
| **1999** | 26,077 | $48,714 |
| **2000** | 23,423 | $46,123 |
| **2001** | 30,520 | $42,354 |
| **2002** | 25,312 | $35,256 |
| **2003** | 29,321 | $37,471 |
| **2004** | 18,377 | $30,945 |
| **2005** | 22,818 | $42,640 |
| **2006** | 14,747 | $28,548 |
| **2007** | 14,225 | $29,145 |
| **2008** | 11,714 | $23,307 |
| **2009** | 9,652 | $18,599 |
| **2010** | 8,728 | $20,375 |
| **2011** | 11,350 | $28,856 |
| **2012** | 9,937 | $21,409 |
| **2013** | 9,489 | $18,209 |
| **2014** | 10,189 | $19,483 |
| **2015** | 9,949 | $19,046 |

*Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016*

**Figure 4 - Monkfish landings and revenue, 2005 - 2015**



## 3.2 PURPOSE OF RSA AS STATED IN EACH FMP

### 3.2.1 Scallop FMP

The combination of low prices and catch rates in the late 1990's prompted interest in developing an experimental fishery to survey scallops in closed portions of Georges Bank. The success of this program, both in the scientific objectives achieved and method of generating funding for research, led to the formal establishment of the Scallop Research Set-Aside program through Framework 11 to the Scallop FMP in 1999. One percent, roughly 95,000 pounds, of the sea scallop quota was set aside from the Nantucket Lightship Closed Area, Closed Area I, and the entire open area (Federal Register 65 FR 00-22203, Stokesbury 2002, DuPaul 2002, Stokesbury et al. 2004). The first request for proposals under the Scallop RSA identified the scope of the program as: "projects funded under the sea scallop TAC set-aside program should enhance the understanding of the scallop resource or contribute to the body of information on which management decisions are made" (65 CFR 52697, 2000).

The priorities of the sea scallop RSA were to "conduct research in gear development for bycatch reduction, habitat impact, rotational fishing strategies, size selectivity, and incidental mortality of scallops and other species" as well as "encourage industry participation by compensating the vessels for potential decreased efficiency and increased cost when participating in a research program" (NOAA 1999). The regulations for the scallop RSA changed several times through the programs first ten years. Amendment 10 in 2004 increased the amount set aside from one percent to two percent of closed area quota and open area days-at-sea (DAS).

A suite of changes was made to the research set-aside program in 2011 to improve its timeliness and effectiveness (NEFMC 2011). First, the RSA program shifted to a multi-year process, meaning it would be more in line with the specifications process and research projects and TACs could span two years if proposed as such. Second, The RSA set-aside allocation for both open area DAS and access area trips was changed from a percentage to a set poundage. The Council supported increasing the set-aside amount, initially set at 1.25 million pounds, but decided not to support the subdivision of RSA funding by topic. Third, program structure was modified so that rollover of unused RSA TAC could be used for awarded projects that apply for compensation based on an incorrect estimation of price-per-pound in the Federal Funding Opportunity. In addition, unused RSA quota may be used to increase the scope of an awarded project. A grace period during the first quarter of the following fishing year was implemented as an extension for harvesting compensation awarded RSA TAC if needed.

The Council supported increasing public input of the RSA process through increased involvement of the advisory panel in setting research priorities and participating on management review panels if not involved in proposals. Finally, three measures were identified from which RSA projects could be exempt if identified in the proposal: crew restrictions, seasonal closures of access areas in the Mid-Atlantic to reduce impacts on sea turtles, and the requirement to return to port if fishing in more than one area.

### 3.2.2 Herring FMP

The Herring RSA program was established in 2007 under Amendment 1 to the Herring FMP (NEFMC 2006, Section 4.8). That action authorizes the Council, in consultation with the ASMFC, to allocate 0-3% of the Herring ACL from each management area to pay for research. Set-aside amounts are specified by area and tracked/monitored separately, but they may be used to support herring-related research in any management area(s) consistent with the research priorities identified by the Council. The Council would determine the specific percentages for the research set-asides and the management area(s) to which they apply during the fishery specification process.

Amendment 1 was relatively general in terms of the purpose of the herring RSA program, basically to support herring-related research. The original Herring FMP included an objective related to research, "to promote research and improve the collection of information in order to better understand herring population dynamics, biology and ecology, and to improve assessment procedures and cooperation with Canada, and to move to real time management of herring. Amendment 1 included very similar overall goals and objectives that superseded the original FMP goals and objectives. Amendment 1 updated the research related objective to, "promote and support research, including cooperative research, to improve the collection of information in order to better understand herring population dynamics, biology and ecology, and to improve assessment procedures."

Amendment 1 explains that adoption of the herring RSA program directly supports the objective described above and may lead to better long-term management of the herring resource. The Amendment states that because of the perception by some that herring is an underutilized species as well as the low market value of the product, it is often difficult to obtain funding for herring research. However, there is a critical need to better understand important biological and life-history parameters for the Atlantic herring resource as the area-specific and fishery-wide exploitation rates increase. When funding is available, it is frequently difficult to get herring vessels as research platforms for the following reasons:

- lost income from missed fishing days;
- intense fishing schedule leading to captain/crew exhaustion;
- volatility of markets; and
- expense of running the vessels (i.e. fuel, food, crew, gear).

Amendment 1 states, "a TAC set-aside for research in the herring fishery is intended to help to eliminate the constant pursuit of soft money to fund industry-based research programs (i.e. herring tagging and inshore hydroacoustic survey).

Amendment 1 specified that participating vessels could be exempt from some regulations to provide incentive for participation. GARFO issues an Exempted Fishing Permit to participants that includes two exemptions from herring regulations: 1) participating vessels are exempt from the January-May Area 1A seasonal closure; and 2) participating vessels are exempt from the 2,000 lb possession limit that takes effect when/if a herring management area closes due to harvest of the sub-ACL. Participating vessels are subject to all other herring fishery regulations, including the MWT restriction in Area 1A from June - September. Since Amendment 1 there are

a few other measures that participating vessels are exempt from including the seasonal closure of Area 1B from January – April.

### 3.2.3 Monkfish FMP

Amendment 2 to the Monkfish FMP established the RSA program (NEFMC, 2004).

> "In addition to complying with the goals of the Magnuson Act, generally, and the Sustainable Fisheries Act amendments, specifically, the goals of this amendment are:
>
> I. Prevent overfishing or rebuild overfished stocks as necessary.
> II. Address problems created by the implementation of the FMP.
> *Objectives:*
> *1) Reconsider the limited entry program for the monkfish fishery south of 38° N*
> *2) Address problems for deepwater fisheries resulting from the disapproval of the running clock in the original FMP*
> *3) Address the problem of multispecies or sea scallop permit holders having to use a multispecies or sea scallop day at sea (DAS) when using a monkfish DAS*
> *4) Establish appropriate exemptions for vessels fishing for monkfish outside of the EEZ (in the NAFO Regulated Area)*
> III. Promote improved data collection and research on monkfish
> IV. Comply with Council on Environmental Quality Guidelines to update Environmental Documents
> V. Address deficiencies in meeting Magnuson Act requirements
> *Objectives:*
> *1) Meet Magnuson Act requirements for Essential Fish Habitat*
> *2) Address known bycatch issues, specifically due to trip limits and minimum fish size*
> VI. Address protected resources/fishery interactions
> *Objective: specifically address the turtle/gillnet interaction*
> VII. Reduce FMP complexity where possible.

Amendment 2 had many measures to comply with these goals and objectives including several related to improved data collection and research. Decision 12 in particular, considered options for these improvements related to Goal #3 of Amendment 2.

**Table 2- Summary of Monkfish Amendment 2 DSEIS Alternatives and Issues/Impacts**

| Decision 12 | Details | Impacts/Issues |
|---|---|---|
| **Cooperative Research programs funding.** Two alternatives, not including no action, could both be adopted. Four options for DAS set aside/exemptions under consideration: 50, 100, 200, or 500 DAS. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others. | | |
| **Research Alternative 1** – DAS set aside | 1. Vessel allocations would be reduced by equal contribution to pool for research/surveys<br>2. NMFS would award DAS to vessels conducting research/surveys based on proposals' requests. | 1. Would streamline research program review and provide cost-reductions through allowing monkfish landings<br>2. Vessel contributions to be less than 1 DAS for the largest proposed pool of DAS (500)<br>3. **Goal III; Goal V, Objectives 1 & 2; Goal VI** |
| **Research Alternative 2** - DAS Exemption | 1. Vessel allocations would not be reduced<br>2. NMFS would issue exemption upon approval of Experimental Fishery Permit application | 1. see item 1 above<br>2. Committee preferred alternative |
| **Research Alternative 3 – no action** | 1. Vessels conducting research under EFP or NMFS' RFP may not land monkfish unless they complete an Environmental Assessment to analyze the impacts of a DAS exemption | 1. Reduced incentive for cooperative research |

No substantive FMP changes have been made to the Monkfish RSA program since its inception. Any modifications have focused on improving flexibility. A Regulatory Amendment allowed awarded Monkfish RSA DAS to be carried over into the subsequent year (March 10, 2010 [75 FR 12141]). Amendment 5 allowed any future modifications to the RSA program to be done via a framework adjustment (NEFMC, 2011).

FW9 considered allowing vessels fishing on a Monkfish DAS to re-declare, while at sea, to a Monkfish RSA DAS. This would have allowed vessels to more efficiently use their Monkfish RSA DAS by only using them when higher amounts of monkfish were encountered. However, there were concerns about the impacts this alternative could have on the RSA program so it was not recommended by the Council. If vessels reduced the uncertainty of when a Monkfish RSA DAS might be needed, they may use fewer RSA DAS overall, which could negatively impact the program.

Recently researchers have had difficulties in selling all their Monkfish RSA DAS. This issue was discussed at an Advisory Panel and Committee meeting in 2017. Strong support was expressed for the RSA program at those meetings. However, participants were not in favor of the proposal

to allow Category E (open/incidental permit category) to also purchase Monkfish RSA DAS. It was thought to provide a backdoor into the limited access fishery for non-limited access permit holders.

### 3.3 AMOUNT OF RSA BY FMP

The New England Fishery Management Council reserves set-aside quota and days-at-sea through fishery management plan specifications and frameworks. The amounts are established under each respective fishery management plan, and may be adjusted through future Council action. The total awards by program and year are included in Appendix IV. Table 2 through Table 4 summarizes the amount of RSA awarded compared to RSA harvested for all three programs for the last five years (2013-2017). Overall, most of the RSA awarded in the scallop and monkfish plans are utilized. The Atlantic herring RSA program has had more issues with RSA usage. When herring management areas do not close and remain open for the entire fishing year, the incentive to participate in RSA compensation fishing is reduced.

- Scallop FMP: 1.25 million lb. per year. Up to 2 year awards.
- Herring FMP: Up to 3% of each management area sub-ACL. 3 year award cycles.
- Monkfish FMP: 500 DAS per year. Multi year awards possible.

**Table 2. Scallop RSA awards compared to RSA landed catch (2013-2017)**

| Scallop Year | Award amount (lbs) | Landed (lbs) | Percent landed |
|---|---|---|---|
| 2013 | 1,250,000 | 1,204,775 | 96% |
| 2014 | 1,250,000 | 1,104,610 | 88% |
| 2015 | 1,250,000 | 1,212,570 | 97% |
| 2016 | 1,250,000 | 1,234,215 | 99% |
| 2017 | 1,250,000 | 1,234,543 | 99% |

**Table 3. Monkfish RSA awards compared to RSA landed catch (2013-2017)**

| Monkfish Year | DAS Awarded | DAS used | % DAS Used | Allowed (lbs) | Landed (lbs) | % Landed (lbs) |
|---|---|---|---|---|---|---|
| 2013 | 426 | 342 | 80% | 1,363,200 | 1,207,174 | 89% |
| 2014 | 500 | 354 | 71% | 1,600,000 | 1,289,243 | 81% |
| 2015 | 500 | 301 | 60% | 1,600,000 | 1,290,238 | 81% |
| 2016 | 500 | 332 | 66% | 1,776,000 | 1,541,240 | 87% |
| 2017 | Compensation fishing ongoing through end of 2018 fishing year | | | | | |

**Table 4. Herring RSA awards compared to RSA landed catch (2013-2017)**

| Herring Year | Awarded (MT, all areas) | Landed (MT, all areas) | % Landed (all areas) | Awarded (MT, 1A) | Landed (MT, 1A) | % Landed (1A) |
|---|---|---|---|---|---|---|
| 2014 | 1,974 | 767 | 39% | 936 | 767 | 82% |
| 2015 | 1,974 | 739 | 37% | 936 | 739 | 79% |
| 2016 | 2,196 | 698 | 32% | 936 | 698 | 75% |
| 2017 | 2,196 | 0 | 0% | 936 | 0 | 0% |
| 2018 | 2,196 | 227 | 10% | 936 | 227 | 24% |

## 3.4 RSA PLANNING AND PRIORITY SETTING BY FMP

### 3.4.1 Scallop FMP

Scallop RSA priorities are set annually by the Council, typically at the June Council meeting. The annual priority setting cycle is completed over 6-7 total meetings of various Council groups (Plan Development Team, Advisory Panel, Committee, and Council) during the first half of the year. In recent years, the process has kicked off at a joint meeting of the Scallop PDT and AP, commonly referred to as a "Scallop RSA Share Day." The goal of the meeting is to have RSA recipients present results of projects for the PDT and AP to consider before forming research priority recommendations for the following year. The PDT develops its own recommendations, which are presented to the Advisory Panel and Committee prior to the June Council meeting. Committee recommendations are presented to the full Council for approval, before being sent through correspondence to the Director of the Northeast Fisheries Science Center.

NOAA publishes a federal funding opportunity (FFO) over the summer, and project proposals are generally due sometime in September or October. Finalizing the priorities in June is important because it allows stakeholders to learn which projects were funded through the prior year's award cycle when considering changes to program priorities.

The Council has typically ranked scallop priorities into several tiers. Industry-based survey work is consistently identified as the top priority

### 3.4.2 Herring FMP

Priorities for herring RSA are generally set every three years consistent with a specifications cycle (i.e. 2013-2015, 2016-2018). In more recent years the Council has set priorities earlier in the year, so solicitation of grants can be processed earlier and awards made closer to when three-year specifications packages are implemented. The priority setting process generally begins with the Herring Plan Development Team (PDT) making suggestions for the Herring Committee to consider. The Herring Advisory Panel also makes recommendations to the Herring Committee.

Ultimately those are presented to the full Council, and the Council approves the final list of herring RSA priorities. They are sometimes listed in priority order, but not always. After the Council approves priorities, they are generally sent to NEFSC and GARFO by letter immediately after the meeting. NEFSC then prepares and administers the announcement of the federal funding opportunity, or FFO.

### 3.4.3 Monkfish FMP

Initially monkfish RSA priorities were set annually with proposals solicited on an annual basis. In 2010, MF RSA DAS were allowed to be carried over into the year following the initial award. In 2014, the program shifted to a two-year cycle; the FMP always recognized awards could be made for longer than 1 year, but the program did not shift to a biannual process until 2014. The Advisory Panel (AP) and Committee review the previous RSA cycle's priorities and recommend any changes to be considered by the Council. Discussion of the RSA priorities is not necessarily tied to the setting of specifications, which are set every three years. If no meetings are held in time for the AP and Committee to discuss RSA priorities, the review can be conducted via email. After Council approval, the RSA priorities are sent to NEFSC and GARFO.

## 3.5 PROGRAM IMPLEMENTATION

The Northeast Fisheries Science Center (NEFSC), Greater Atlantic Regional Fisheries Office (GARFO), and the New England and Mid-Atlantic Regional Fishery Management Councils share responsibility for the implementation of the region's research set-aside (RSA) programs. The NEFSC is responsible for executing grant competitions and making project selections, overseeing research activities and results, program outreach and communication, and general program management. GARFO is primarily responsible for compensation fishing oversight, vessel permitting, and fishery policy and regulatory issues. NOAA Fisheries programs that are substantially involved in the implementation of RSA programs include: Fishery Research and Monitoring Division, Population Dynamics Branch, Sustainable Fisheries Division, Analysis and Program Support Division, and Office of Law Enforcement. The Council is primarily responsible for setting RSA specifications and research priorities, making program adjustments through fishery management plan actions, and considering research results in support of management decisions. Each program differs slightly in terms of program implementation and involvement of staff; the overall process is described below highlighting some of the differences.

### 3.5.1 Scallop FMP

Council staff support both the technical and management reviews of the scallop RSA. Council staff take an active role in supporting the management review panel. Staff provide a list of potential management reviewers to the Committee Chair and Council leadership. A final list is then submitted to the Northeast Fisheries Science Center, who makes the final determination on review participants. In recent years, the Council staff have handled management review panel logistics, such as arranging a meeting space and coordinating travel arrangements for attendees. The Council covers travel cost for eligible reviewers. The time spent supporting the management review can be substantial as reviewers are asked to read all proposals in advance of the meeting. Reviewing proposals can take 3-5 days, depending on the number of proposals that are submitted. Following the meeting, reviewers are required to provide comments through a web-based portal. Council staff also participate in technical reviews of RSA proposals. Reviewing

proposals generally takes 2-3 hours, depending on the proposal. Finally, a member of Council staff generally listens to the survey review panel discussions.

### 3.5.2 Herring FMP

NEFMC staff plays a role in the technical and management reviews of herring RSA applications. There are usually less than a handful of herring RSA applications in a funding cycle. NEFMC staff also provide a list of potential management reviewers, who are usually selected from the Herring Committee. NEFMC resources (staff and Committee members) needed to support the Herring RSA review process is minor, because the number of applications is relatively small, and the awards are made every three years. Administratively, the resources from GARFO and NEFSC needed to support the Atlantic herring RSA program are the same as described above for scallops, just at a reduced scale because this program is smaller.

### 3.5.3 Monkfish FMP

NEFMC staff typically participate in the technical and management reviews of monkfish RSA proposals, barring a conflict of interest. There are usually a handful or more (4-8) proposals submitted for consideration. NEFMC staff also provide a list of management reviewers, who are usually selected from the Monkfish Committee. Administratively, the resources from GARFO and NEFSC needed to support the monkfish RSA program are the same as described above for scallops, just at a reduced scale because this program is smaller.

## 3.6 DURATION OF PROJECTS

Each FMP specifies how long an RSA award can be:

- Scallop: up to 2 year awards but a yearly competition
- Herring: 3 year awards
- Monkfish: multi year awards (awards have been 2-years since 2014)

Federal grant award periods can extend up to a 5 year period. However, the RSA program priorities and available set asides, established by the Councils, drive the project selection process and change regularly. The inconsistent state of the program priorities, available set asides, and interest in timely research results, has limited the duration of RSA grants. Potential use of longer term awards is discussed under findings and recommendations.

## 3.7 RSA AWARDS TO DATE (2000-2018)

Appendix IV summarizes the RSA awards to date including the title, principle investigator, award amount, as well as detail about the estimated research/compensation split. The RSA Review panel has also completed an evaluation of the potential utility of each program in terms of whether the RSA results have had high, medium, low, or no impact on fisheries management and or scientific knowledge.

# 4.0 WHAT MAKES RSA FEDERAL GRANTS UNIQUE

## 4.1 VALUING AND MONETIZING (CONVERTING TO CASH) RSA CURRENCY (FISHERY RESOURCE)

### 4.1.1 How is RSA valued during compensation fishing?

RSA awards offer a future fishing opportunity to land scallops, monkfish, or herring. Because the revenue generated from future fishing trips is unknown, the value of RSA quota and days-at-sea must be estimated. These estimates are established by NOAA Fisheries when project selections are made. NOAA Fisheries, in consultation with the Council and fishing industry members, uses product price information from recent RSA compensation fishing trips, historical price information, and future price projections to determine how much set-aside quota or days-at-sea to offer favorably reviewed applicants.

Successful grant recipients are awarded set aside quota or days-at-sea instead of money. Monetizing RSA requires partnering with the fishing industry to harvest set-aside pounds or use days-at-sea through RSA compensation fishing. The grant recipient and industry partner either share the proceeds generated from compensation fishing trips, or the grant recipient sells the right to harvest RSA pounds or use days-at-sea outright. The proceeds retained by the grant recipient are used to fund the research. Table 5 through Table 7 summarizes the estimated RSA prices and value for each program compared to the actual prices and value, averaged across each FMP.

**Table 5. Estimated scallop RSA price and RSA value compared to actual price and value (2013-2017)**

| Scallop | Est. price/lb | Actual price/lb | Error | Research impact | Est. RSA value | Actual RSA value |
|---|---|---|---|---|---|---|
| 2013 | $9.75 | $ 11.41 | 15% | $ 439,385 | $13,119,072 | $13,746,483 |
| 2014 | $10.50 | $ 12.55 | 16% | $ 606,197 | $16,512,719 | $13,955,726 |
| 2015 | $12.00 | $ 12.54 | 4% | $ 157,124 | $16,167,060 | $15,213,290 |
| 2016 | $12.00 | $ 13.25 | 9% | $ 316,431 | $14,051,028 | $16,381,876 |
| 2017 | $12.00 | $ 9.86 | -22% | $ (816,192) | $15,318,221 | $12,230,778 |

**Table 6. Estimated herring RSA price and RSA value compared to actual price and value (2013-2017)**

| Herring | Research $/mt | Total research value est. | Total research value actual* | % of budget met | % RSA harvested | Total RSA value actual | Mackerel value from RSA trips |
|---|---|---|---|---|---|---|---|
| **2013** | - | - | - | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2014** | $75 | $ 148,050 | $57,525 | 19% | 39% | $ 228,566 | $603,697 |
| **2015** | $75 | $ 148,050 | $55,425 | 19% | 37% | $ 279,342 | $286,691 |
| **2016** | $75 | $ 235,800 | $52,350 | 36% | 22% | $ 307,818 | $1,838,704 |
| **2017** | $75 | $ 235,800 | $0 | 0% | 0% | $0 | $0 |

*Note: Does not include proceeds from mackerel landings*

**Table 7. Estimated monkfish RSA price and RSA value compared to actual price and value (2013-2017)**

| Monkfish | DAS research value | Total research | Total value est. | Lbs landed | Actual value | Mean comp split |
|---|---|---|---|---|---|---|
| 2013 | $588.00 | $287,861 | $1,525,652 | 1,207,174 | $1,146,816 | 0.19 |
| 2014/2015 | $585.78 | $585,783 | $1,986,938 | 1,289,243 | $1,289,243 | 0.18 |
| 2016/2017 | $592.62 | $591,883 | $3,777,240 | 1,290,238 | harvest ongoing | 0.16 |

### 4.1.2 In practice, how do projects use RSA currency?

RSA grant recipients partner with fishing vessel owners to harvest RSA quota or use RSA days-at-sea. They either share the proceeds from the RSA compensation fishing, or the vessel owner may purchase outright the opportunity to conduct compensation fishing from the grant recipient. The proceeds retained by the grant recipient are used to fund the research.

GARFO issues exempted fishing permits and RSA letters of authorization to grant recipients that authorize vessels to exceed fishery effort controls in support of RSA compensation fishing.

- Scallop RSA - Vessels are authorized to take additional fishing trips and are exempt from scallop possession limits.
- Herring RSA - Vessels are authorized to fish in herring management areas that are closed to the directed herring fishery after a management area quota is attained; and to harvest herring RSA quota during Area 1A and 1B sub-ACL seasonal closures.
- Monkfish RSA - Vessels are authorized to take additional days-at-sea above the vessel allocation, and to exceed monkfish possession limits.

### 4.1.3 What are the risks associated with RSA currency?

**Valuation uncertainty**
RSA compensation fishing offers additional fishing opportunities and the value of these opportunities are fishery specific. The value of RSA quota and days-at-sea are estimated by NOAA Fisheries at the time RSA grants are selected. These estimates may be made 1-3 years before the set aside is harvested or DAS are used. NOAA Fisheries, in consultation with the Council, uses product price information from recent RSA compensation fishing trips, historical price information, feedback from previous grant recipients, input from industry members, and future price projections to determine how much set-aside quota or days-at-sea to offer favorably reviewed applicants.

There is inherent uncertainty when estimating the value of future fishing opportunities. When incentives that drive RSA currency value are consistent, uncertainty is lower, but as uncertainty or volatility associated with these factors increases, valuation becomes less certain and more difficult to project. These incentives vary significantly between programs. High uncertainty results in conservative estimates in an attempt to mitigate risk to supported projects, and recognition by program managers that funding needs may not be, or are unlikely to be met. If the estimates are too high then grant recipients may not be able to generate sufficient funds to support their research and/or industry partners may not be adequately compensated. Conversely, if estimates are too low, there may be lost opportunity to fund additional projects.

RSA value is primarily driven by financial incentives for industry participants to pay for fishing opportunities. If there is no financial incentive then set aside quota or DAS will not have value to support research.

**RSA Program fishing opportunities:**

- Scallops - Vessels can fish beyond vessel allocations (i.e., take additional trips and exceed possession limits) and RSA allocations can be carried over 3 months into the following fishing year. There have been sufficient effort controls in the scallop fleet and a relatively high product value that has resulted in consistent financial incentive for industry to participate in compensation fishing. The primary risk factor in the scallop program lays with the estimated price per pound that is used during the award process. The impact of underestimating price will depend on the terms of the agreement between the grant recipient and industry partner. The risk associated with the price estimate is greater for multi-year awards. There is some flexibility built into the scallop RSA program that enables NOAA Fisheries to award additional scallops to offset lower than expected price estimates. To date this process has leveraged RSA quota from the following year due to all scallops from current year having been awarded. This means projects will need to wait until the next fishing year before those scallops can be harvested. Scallop compensation fishing incentives are consistently strong.

- Monkfish - Vessels can fish more DAS than allocated and exceed permit possession limits, and RSA allocations can be carried over for the following fishing year. There are multiple factors that can impact the incentive to pay for additional DAS. If vessel DAS allocations and/or possession limits are not constraining, then incentive will be low.

Other risk factors include low monkfish price, low skate possession limits, seasonality of the fishery and timeliness of RSA award and permitting, and limited pool of prospective monkfish vessels (e.g., no northern area vessels participate). Monkfish compensation fishing incentives have been moderately consistent.

Some issues that have influenced the use of monkfish RSA DAS include:

- Lack of participation by Northern Management Area boats.
- Skate closures that trigger incidental possession limits;
- Rising DAS allocations and monkfish possession limits;
- Low monkfish price.

- Herring: Vessels are authorized to fish in herring management areas that are closed to the directed herring fishery after a management area quota is attained; and to harvest herring RSA quota during Area 1A and 1B sub-ACL seasonal closures. There are multiple risk factors that affect the viability of herring RSA compensation fishing incentives. Foremost, it is dependent on an area being closed to the directed fishery. Other risk factors include days out management strategy to extend directed fishery and limited harvest opportunities, low herring price, herring and/or mackerel availability, haddock and river herring catch cap closures, and insufficient set aside to warrant compensation fishing trips. Herring compensation fishing incentives have been moderately consistent for Area 1A, and low for all other areas.

Grant recipients need to be familiar with fleet and fishery dynamics, understand industry incentives to participate in compensation fishing, and have the ability to leverage or establish strong partnerships with industry. A lack of understanding or willingness to understand will negatively affect the ability of grant recipient to work with the fishing industry to convert awarded RSA into research funds.

Strong oversight of compensation fishing is also important to ensure set aside quota and DAS are not exceeded. Abuse of compensation fishing privileges erodes support for RSA programs. A summary of the proportion of set aside used by FMP for the last five years is summarized in Table 2 through Table 4.

### 4.1.4 How do projects report use of RSA currency?

In accordance with the terms and conditions of RSA compensation fishing permits, vessels harvesting RSA quota or using RSA days-at-sea have additional reporting requirements. The vessel operator must notify NOAA Fisheries prior to departing on an RSA compensation fishing trip to establish their intent to harvest RSA quota (or use DAS), and to identify, among other things, the project the vessel is operating under, and when and where the vessel will land. Prior to landing, the vessel operator must report, among other things, the amount of RSA quota (and in some cases other species) on board, vessel trip report serial number, and when and where the vessel will land. After landing, a final report may be required, which includes the exact amount of RSA quota landed, the state where the fish were landed, and the vessel trip report serial number. NOAA Fisheries monitors vessel trip reporting requirements to ensure reporting requirements are met and validates trip report data with other data sources such as dealer reports

and vessel monitoring system data. Vessel operators and principal investigators are contacted when requirements are not followed or there are inconsistencies with other data sources. In the event that vessel operators persistently do not follow the requirements, the vessel is removed from the compensation fishing permit by NOAA Fisheries in accordance with the RSA Compensation Fishing Compliance Policy.

Grant recipients are required to detail progress toward the achievement of project objectives in six-month intervals, beginning from the award start date. A final report that details study accomplishments throughout the award period is also required. Grant recipients must submit a detailed accounting for compensation fishing activities with each progress report and the final report. In addition, for the final report, the grant recipient must provide a final accounting of all funds derived from compensation fishing, and address the following questions: 1. If more funds were generated than the total amount of funds identified in the proposed budget, provide a detailed description for how those funds were used, or will be used, or 2. If fewer funds were generated than the total amount of funds identified in the proposed budget, describe why the shortfall occurred, and if it affected project proposed goals and objectives.

### 4.1.5 Estimate the ratio of "research" to RSA fishing costs (i.e., how much research does $1,000 worth of RSA currency buy?)

The proportion of funds generated through RSA compensation fishing that is used to support research varies between programs and projects. RSA grant recipients are required to specify in their application the amount of funds needed to conduct their project and to compensate fishing industry partners that conduct compensation fishing on their behalf. The mean proposed proportion of revenue generated from scallop and herring compensation fishing trips from 2013-2017 to support the research project has been 24% and 27%, respectively and under 20% for monkfish (Table 8).

**Table 8. Ratio of research to total cost for each RSA program, averaged across each FMP (2013-2017).**

| | 2013 | 2014 | 2015 | 2016 | 2017 | *Mean* |
|---|---|---|---|---|---|---|
| **Scallop** | 25% | 25% | 25% | 25% | 24% | *25%* |
| **Monkfish** | 19% | 18% | 18% | 16% | 16% | *18%* |
| **Herring** | - | 26% | 26% | 28% | 28% | *27%* |

### 4.1.6 Implications of paying for research with RSA currency

The RSA program is unique with its requirement for grant recipients (typically the principal investigator), to partner with the fishing industry to convert their set-aside award into money. Successful RSA conversion entails close coordination with the fishing industry, an understanding of how the fishery operates and the corresponding compensation fishing opportunities and industry incentives. This process creates a substantial administrative burden on grant recipients

and requires a certain level of expertise of the subject fishery. It is critical that grant recipients maintain strong oversight of their award and compensation fishing activities, participating vessels understand and follow program requirements, and that RSA allocations are not exceeded. In addition, due to the uncertain value of set aside awards, it is possible that insufficient funds will be generated to cover the research expense (conversely, more money may be generated).

Although these factors likely reduce the pool of potential RSA program applicants, there are tangible benefits that result from the necessity of the research program to work so closely with the fishing industry through compensation fishing.

## 4.2 AWARDING OF RSA PROJECTS - FUNDING VEHICLES

### 4.2.1 Background on the reason for using grants

The determination to administer RSA programs as a grant program was made by the Department of Commerce's Office of General Counsel (DOC OGC) in 2000. This decision was based on the nature of the RSA programs, and the fundamental difference between grants and contracts. NOAA's primary purpose with respect to this program is not to acquire services from the applicants for its direct benefit or use. Rather, the agency is providing financial assistance to the researchers to accomplish a public objective focused on fisheries research and Council research priorities.

Since this initial determination, there have been repeated inquiries into whether RSA programs could be administered through contractual arrangements instead of grants. DOC OGC has consistently advised that there is no basis upon which to revise its original advice that, as configured, the RSA programs should operate using a grant funding mechanism as opposed to a contract award. Issuance of federal contracts require payment through use of appropriated funds only, grants do not. However, if there are modifications to the current structure and/or mechanism of the RSA program that would enable use of contracts (e.g. sea scallop surveys that meet a standardized design to support area rotational management) some members of the RSA review panel encourage the Council to explore that further with NOAA.

While the review panel chair is not qualified to make a judgment about the legal determination that grants, not contracts, should be used given the way the RSA programs are presently configured, at least he expected a more complete explanation and an opportunity to discuss assumptions or perceptions about RSA programs (e.g., its current configuration) that were important consideration in making the determination. If and when the full RSA review report is reviewed by the Office of NOAA General Council, it would be valuable to have a more complete explanation of the basis of the determination and if there are any modifications to the current structure that could improve flexibility.

Table 9 summarizes the main differences between a federal grant and federal contract.

**Table 9. Comparison of federal grant and contract.**

| GRANT | COOPERATIVE AGREEMENT | CONTRACT |
|---|---|---|
| Transfer money or property to support or stimulate a public purpose authorized by law | Transfer money or property to support or stimulate a public purpose authorized by law | Acquisition of goods or services for Federal Awarding Agency use |
| Advance payment allowed if appropriate | Advance payment allowed if appropriate | Pay with appropriated funds for delivery after receipt |
| Technical/program competed | Technical/program competed | Price must be considered |
| Grantee can terminate | Grantee can terminate | No Contractor right to terminate |
| Deliverable is a report or completion of project | Deliverable is a report or completion of project | Product or service required |
| Office of Management and Budget Circulars | Office of Management and Budget Circulars | Federal Acquisition Regulations |
| No substantial Federal involvement | Substantial Federal involvement | No Federal involvement |

### 4.2.2 Legal requirements and restrictions that apply to grants

Financial assistance and acquisition instruments create different relationships between the government and the private sector. Because of these different relationships, the decision to use a particular instrument must be made deliberately and in accordance with the rules for using that instrument.

Assistance is the process of transferring money, property, services or anything else of public purpose of support or stimulation authorized by federal statute. Assistance instruments include grants and cooperative agreements. A grant award is used for assistance when no substantive involvement by the government is anticipated. This means that the recipient can expect to perform the project without substantial agency collaboration or intervention although the agency is expected to monitor the recipient's performance. If substantive agency involvement is anticipated, a cooperative agreement is the appropriate award instrument. Substantial involvement exists when responsibility for project management, control direction, or performance is shared by the assisting agency and the recipient; or the assistance agency has the right to intervene, including interrupting or modifying project activities. Examples of substantial RSA programmatic involvement include:

- Participating in the redesign or redirection of activities
- Participating in the collection and/or analysis of data
- Participating in the selection and approval of analysis mechanisms
- Participating in the presentation of results in publications.

Acquisition means the process of acquiring with appropriated funds, by contract for purchase or lease, property or services (including construction) that support the missions and goals of the federal government. A contract includes all types of commitments that obligate the government to an expenditure of appropriated funds. Contracting means purchasing, renting, leasing or otherwise obtaining supplies or services from non-federal services. Contracts require the description (but not determination) of the goods and services to be acquired that are already in existence that must be created, developed, demonstrated, and evaluated.

### 4.2.3 Other procurement vehicles that were considered and rejected, and why

The Council has asked if the RSA program could be conducted using contracts instead of grants. The DOC OGC advised that there is no basis upon which to revise its original advice that, as presently configured, the RSA Program should operate using a grant funding mechanism as opposed to a contract award. NOAA's primary purpose with respect to this program is providing financial assistance (in this case, amounts of fish that can be sold to offset the cost of conducting research) to the researchers to accomplish a public objective focused on fisheries research. This determination is dispositive and supports the use of federal assistance to fund these projects.

As stated in Section 4.2.1, at least the panel chair wonders what it is about the present configuration of RSA that prohibits use of contracts, and if the configuration might be changed to allow contracts when appropriate.

The Council has also asked if they could enter into contractual agreement with outside entities to fund scientific research under the RSA Program. DOC OGC determined the functions of the fishery management council are set forth in section 302(h) of the Magnuson-Stevens Fishery Conservation and Management Act (Act). None of these functions contemplate that the Council can take over administration of the RSA program. Such activity would be well beyond the Council function in section 302(h)(7) that empowers the Council to develop research priorities, as it currently does for the RSA Program.

The Council asked if they could enter into a contractual agreement with a third party to sell RSA species of fish at auction to generate revenues to fund scientific research. DOC OGC determined that the only auction authority contained in the Act appears at section 303a(d) which deals with auctioning off allocations under a limited access privilege program to collect royalties. Given that Congress limited the auction authority to this activity, the canons of statutory construction does not support an additional Congressional intent to allow the Council to auction off RSA species of fish.

The Council asked if revenues generated from an auction of RSA species of fish could be deposited in a fund established by the Council. DOC OGC determined monies generated as a result of an auction might be considered program income which must be applied to the administration of the Council grant or returned to the agency. A fund to receive monies from the

auction can only be established if there is express statutory authority to do so. There is no such authority in the Act.

## 4.3 PROJECT SELECTION

### 4.3.1 The project selection process is outlined under the Federal Funding Opportunity and made available on the RSA Program webpage and summarized below.

#### 4.3.1.1 Technical review

NMFS solicits written technical evaluations from three or more federal and public/private sector experts (typically 1-NEFSC and 2-combination GARFO, Council, Industry or other subject matter expert) to determine the technical merit of the proposal and to provide a rank score of the project based on five evaluation criteria (Importance and/or relevance and applicability of the proposed project, Technical/scientific merit, Overall qualifications of the project, Project costs, and Outreach and education). This review is conducted electronically and the result is written technical comments and a technical score based on 100 points.

NMFS may simultaneously convene a survey technical review panel from the same pool of experts to discuss the technical merit of applications (to date this has only been done for scallop resource surveys). Panels that have been convened for scallop resource surveys have consisted of 2 NEFSC Scientist and 2-3 nonfederal scientists. Following panel discussion(s), reviewers submit independent written evaluations and a ranked score in accordance with the technical evaluation criteria listed above.

The median technical score is used to rank the proposals. The technical and management reviews carry equal weight in the selection process.

#### 4.3.1.2 Management relevance review

Management panels are developed for each competition by NMFS and the New England Council. All of the panelists invited to participate are closely involved in issues that relate to the management of each respective fishery, and typically include Council staff and members, industry advisory panel members, fishermen and fishery advocates, and GARFO staff. The size of the management review panel varies between program and years. The monkfish and herring RSA management panels generally have 3-7 panelists, while the scallop RSA management panel has 8-15 panelists. The purpose of this review is to provide comments on the proposal's potential contribution to management decisions in accordance with the Council's Research Priorities listed in the Federal Funding Opportunity. This is a non-consensus review and after the panel meeting, each reviewer provides written comments followed by their recommendation to fund, not fund, or fund if allocation is available.

The technical and management reviews carry equal weight in the selection process.

#### 4.3.1.3 Final Selection by NEFSC

Technical scores and management panel recommendations are the primary basis for funding recommendations. In addition to the technical score and management panel recommendations,

there are program selection factors that are considered. While selection factors may be used as the basis for a selection decision, it is not common. However, the highest ranking projects may not necessarily be selected for an award. The selection factors are listed in the funding opportunity, as follows:

1. Availability of funding;
2. Applicant's prior award performance;
3. Whether this project duplicates other projects currently supported or being considered for support by other NOAA offices;
4. Balance/distribution of RSA quota: Geographically; by type of institutions; by type of partners; by research areas; and by project types;
5. Program priorities and policy factors; and
6. Partnerships and/or Participation of targeted groups.
7. Adequacy of information necessary to conduct a NEPA analysis and determination.

Key program policy factors (see 5 above) to be considered by the Selecting Official are: (1) the time of year the research activities are to be conducted; (2) the ability of the proposal to meet the applicable experimental fishing requirements; (3) redundancy of research projects; and (4) logistical concerns.

Procedurally within NEFSC, RSA program staff make initial selection recommendations to the Fishery Monitoring and Research Division Chief, and then the NEFSC Science and Research Director. Recommendations include a summary of the competition and review results, funding rationale for each proposal, and any modifications that need to be negotiated. It is common for RSA program staff to identify proposal adjustments that would reduce duplication with other research, improve technical merit, or increase management relevance/utility. These adjustments are developed with consideration of technical review and management panelist comments, and in consultation with subject matter experts.

With concurrence from the Science and Research Director, RSA program staff will notify the successful applicants of the favorable review and the intention to fund. As needed, RSA staff will have applicants amend proposals to reduce duplication with other work, address technical issues, or increase management relevance. Once the terms of the award have been established, RSA staff will submit final selection recommendations to the Fishery Monitoring and Research Division Chief, and then the NEFSC Science and Research Director. With concurrence from the Science and Research Director, the selections are submitted to NOAA Grants Management Division for final approval.

#### 4.3.1.4 Avoiding conflict of interest

It is the policy of the Department of Commerce (DOC) to maintain high standards of conduct to prevent real or apparent conflicts of interest in the proposal review process. A conflict of interest exists when a person participates in a matter which is likely to have a direct and predictable effect on his or her personal or financial interests. A conflict also exists where there is an appearance that a person’s objectivity in performing his or her responsibilities is impaired. Non-Federal employees who conduct reviews are required to certify themselves that no conflict exists by signing electronically the Department of Commerce Form CD-571, “Reviewer Conflict of

Interest and Confidentiality Certification for Non-Governmental Peer Reviewers." Federal employees do not sign such a waiver as they are already bound by standards of ethical conduct established at 5 CFR Part 2635, which includes conflict of interest standards. Violations of conflict of interest laws are subject to criminal penalties or fines.

To avoid a conflict of interest and based on grants administrative direction received from DOC's Financial Assistance Law Division, the Agency RSA Program takes an all or none approach. A technical reviewer cannot recuse themselves from a project in which a conflict of interest has been noted but remain available to review other projects within the same competition. This requirement applies to panelist participation too. More details about conflict of interest are included in Appendix VI.

# 5.0 RSA PROGRAM DELIVERABLES AND OUTREACH

## 5.1 PROJECT MONITORING

### 5.1.1 Review for deliverables.

The progress and final reports are typically reviewed by the original NEFSC reviewer. This ensures the reviewer will be familiar with the proposed work and increase the strength of the progress and final report reviews. If the reviewer feels the final report needs additional technical expertise the Federal Program Officer will bring in additional review resources. The following is a list of questions used as a template for the technical review:

1. Did the project accomplish the goals as stated in the Statement of Work?
2. Does the analysis and presentation of data support the conclusions drawn? Are tables and figures legible and serve to support the text?
3. Was the study design modified from the original design? If so, was an appropriate rationale provided? Did the change in design support the research objectives?
4. Does the report relate the conclusions to appropriate management concepts?
5. Does the report offer suggestions for follow-on research?

As needed, technical reviewer questions and concerns are presented to the grant recipient to respond to. The RSA program manager reviews the final reports, the technical reviews, and any response to questions and concerns provided by the grant recipient to ensure a thorough review before the final report is accepted in the Grants On-Line System and made publicly available.

RSA program administration does not currently assign standardized metrics for project performance.

### 5.1.2 Monitoring of financial integrity

The following is a requirement of each RSA grant award:

*A detailed accounting for compensation fishing activities with each progress report and the final report. Compensation fishing reports should be provided in an electronic spreadsheet, and should include the following information: Vessel name, vessel permit number, date landed, RSA scallop pounds landed, scallop RSA value, incidental catch pounds landed by species, incidental catch value, and funds provided to grant recipient. In addition, for the final report, the grant recipient must provide a final accounting of all funds derived from compensation fishing, and address the following questions: 1. If more funds were generated than the total amount of funds identified in the proposed budget, provide a detailed description for how those funds were used, or will be used, or 2. If fewer funds were generated than the total amount of funds identified in the proposed budget, describe why the shortfall occurred, and if it affected project proposed goals and objectives.*

While these requirements have been included in RSA announcements for several years the reporting of compensation fishing activity through progress and final reports has varied by researcher. Some provide very detailed budget summaries, and some do not. In addition, there is not always sufficient staff resources to fully monitor and track final budgets.

Compensation fishing landings are also monitored by GARFO, which includes data on landings value by project based on dealer reports.

### 5.1.3 Distributing and Archiving RSA products

Final reports are posted on the Northeast Cooperative Research website at:
http://www.nefsc.noaa.gov/coopresearch/projects_search_setup.html
Use the project query tool to find RSA project final reports. If the report in unavailable, there is a column within the query output that identifies when report is due.

While there are data sharing and submission requirements associated with RSA grant awards, there is not a standardized process for submitting and archiving RSA data. There is recognition that having a process and requisite information technology infrastructure to host RSA generated data would be valuable.

## 5.2 COMMUNICATION - HOW ARE THE PUBLIC AND POTENTIAL PARTICIPANTS IN RSA INFORMED. WHAT ARE THE FACTORS THAT MOTIVATE OR DISCOURAGE PARTICIPATION IN THE RSA PROGRAM.

NOAA Fisheries, in consultation with both Councils, circulates news releases and email alerts to constituents informing of proposal solicitations and project selections. NOAA Fisheries also maintains a RSA Program webpage that includes information on funded projects and announcements, a comprehensive list of project awards and final reports, and information on how the program operates.

There are several factors that influence interest from the research community in getting involved with RSA programs. The inherent risk and uncertainty associated with awards made in fish quota or DAS deters some scientists and/or their institution. The need to manage the harvest of quota or use of DAS is complicated and time consuming, particularly for researchers not already engaged with these fisheries and familiar with fishing operations and dynamics (e.g., scallop

harvest controls and harvest capacity, monkfish DAS effort controls and permit categories, herring area management and effort controls). Applicants must have some rapport with industry, and be able to execute harvest of set-aside award.

## 5.3 RSA PROGRAM ADMINISTRATION CHALLENGES

There are aspects of program administration that present difficulties primarily due to resource limitations.

***RSA competition administration.***

RSA competitions revolve around the fishing year. The goal is to have awards complete and compensation fishing permits issued by the start of the fishing year. There are many steps in RSA grant competitions, involving multiple participants that must be completed on schedule for this to happen. Stages of the competition that have been challenging include timely publication of the federal funding opportunity notice, securing technical reviewers, timely completion of technical and management panel reviews, refining issues identified during the technical and management panel review phases, and working with applicants where proposal adjustments and refinements are needed.

***RSA compensation fishing oversight.***

It is critical to ensure robust RSA compensation fishing oversight procedures to identify and help prevent potential abuses of compensation fishing privileges. Oversight entails substantial investment from NMFS staff across several line offices, principally the Sustainable Fisheries Division, Analysis and Program Support Division, and Office of Law Enforcement. Furthermore, this oversight is not always transparent to the Council and others due to data confidentiality. It would require additional resources to prepare and communicate reports that could be available to the Council and public about RSA compensation oversight.

***Technical guidance and oversight.***

The RSA programs, and in particular the scallop program, support substantial scientific efforts that range multiple disciplines. Technical guidance and oversight occur primarily at the project selection phase and review of final reports. Additional oversight and guidance would benefit the program. Greater consideration of research results and upcoming research needs would benefit the priority setting process and facilitate proposal submissions. Greater transparency and support for technical input and guidance is needed at the project selection phase. Greater engagement with project recipients throughout the life cycle of the grant would improve oversight and accountability and increase opportunities to provide technical guidance and support. Many projects are effectively ongoing or recurring studies comprised of short term grants that are not procedurally evaluated in scope. Broader oversight and evaluation would increase oversight and accountability for these longer term projects, and likely result in stronger results and funding decisions. Technical guidance and oversight is resource intensive, time consuming, and entails ad hoc support from programs and staff where providing programmatic RSA support may not be a high priority. Additional resources are needed to enable the implementation of more robust oversight and support.

***Outreach***
Due to insufficient program resources, there are limitations on program outreach. Areas that could use additional administrative support include:

- Access to project and program information;
- General outreach of RSA program activities and successes;
- Circulation of RSA research results, reports, and publications; and
- Provide access to RSA generated data sets.

There is a substantial burden associated with the review of progress and final reports that falls on program administrators and reviewers. This can impact the release of final reports.

# 6.0 RSA REVIEW PANEL FINDINGS AND RECOMMENDATIONS

These findings and recommendations are based on feedback received from a widely disseminated online survey, interviews with 20 individuals with broad areas of expertise (including fishermen and industry representatives, Council members and staff, GARFO staff, federal and non-federal scientists, and RSA grant recipients), and knowledge and experience of the RSA review panel members.

**FINDINGS**

***Finding 1. The New England Council's Research Set Aside programs are performing well, and are generally regarded as highly successful, especially the Scallop RSA program.***

RSA programs have broad support among stakeholders, managers, and scientists. In addition to providing valuable information to support fishery management and address fishing industry interests, RSA programs instill a healthy sense of ownership and buy-in to science and fishery management by fishing industry stakeholders.

Some areas of strength include:

1. RSA programs consistently produce scientific information that supports management, including generating data to support specialized management needs (e.g., fine scale sea scallop data for area rotation management) that is not provided by ongoing NMFS programs.
2. RSA grant recipients are actively engaged with the fishing industry and, in many instances, regional science and management programs. This engagement and collaboration engender a more responsive and successful program and fosters trust and mutual respect for science and management.
3. There is broad opportunity to participate in RSA program priority setting.
4. The proposal review process is rigorous, and project selections are largely viewed favorably.
5. The RSA grants programs are generally functioning well, in part because grant administrators maintain effective lines of communications with grant applicants and recipients. Stakeholders consistently expressed that RSA program administration has improved in recent years.

6. Oversight of compensation fishing has improved over the years. Grant recipients seem conscientious about adhering to rules about compensation fishing, and NMFS fishery dependent data collection systems and Office of Law Enforcement monitor RSA awards and compensation fishing activities and remove vessels that do not comply with program requirements.
7. Most RSA grant recipients felt that NMFS issuance of Exempted Fishing Permits and Letters of Acknowledgment related to research and compensation fishing, was efficient and timely.
8. In some cases, RSA programs create profitable fishing opportunities that would not have been available otherwise, which presumably fosters industry support for those that receive these opportunities. Depending on the rules for compensation fishing, it may be more profitable than non-compensation fishing, in which case research is funded at no cost to the fishing industry. By design, the economic benefits foregone by setting aside a portion of Annual Catch Limits to support research is likely to be less than the first sales value of the amount of the set aside. However, in general, vessel profits from compensation fishing trips are less than non-compensation fishing trips due to the portion of proceeds that are used to support research, although it may not always be the case. However, RSA compensation fishing offers fishing opportunities that would otherwise not be available (i.e. fishing during closed seasons), enabling participating fishing businesses to increase net profit for the fishing year. The distribution of benefits among members of the industry is asymmetric, and some industry stakeholders that want to participate have not yet been able to or as much as desired.

While some scientific information generated by RSA programs directly leads to improved management, the panel is not aware of studies that have evaluated the net benefits of RSA programs. That is, do the benefits (i.e. improved management resulting from scientific information produced by RSA programs) exceed the costs (reduction in net revenues from fishing and administrative costs needed to manage the program)? This is an interesting academic question, but it does not diminish the finding that RSA is highly successful. While this review is not a cost benefit evaluation of these programs it does include details about the aspects of the programs that are considered highly successful, as well as specifics about the administrative and collective costs.

***Finding 2. While stakeholders support RSA, the review panel heard concerns about several aspects of the Programs.***

The review panel respects all of the stakeholder concerns, and in most cases, it has suggestions or recommendations to address them. However, some concerns are not supported by evidence and the review panel did not suggest solutions for them. In other cases, the review panel agrees with the concern, but it does not think there are realistic remedies within program constraints (e.g., government wide rules that apply to grant programs).

The concerns are discussed below:

1. Inadequacies in priority setting processes. While there is broad opportunity for input to priorities by Plan Development Teams, Advisory Panels, Committee members, Council members, and the public that participates in numerous open meetings, concerns were expressed that sometimes:

a. There are too many priorities. This may occur because almost anyone can suggest a priority, and it is easier to include it on a long list than to reject it. The list of priorities may not be realistic in light of the available RSA resource and program support.
b. Some priorities lack specificity such that a successful grant application may not produce information that will be used for fishery management. This is particularly problematic when project outcomes are not specified or adequately described in the priority.
c. There is potential for conflict of interest to enter in the process of priority setting at various levels (i.e. PDT members, advisory panel members, etc.) since some participants are also applicants and/or recipients of RSA grants.
d. Ranking priorities does not ensure program balance via the grants selection process. Program balance is usually addressed by allocating budget resources according to both the priority of the topic and the budgetary need to successfully address the topic. The current Council priority setting approach makes program balance an outcome of the NMFS's grants process rather than a Council strategy. The second tier evaluation by the management review panel, which includes Council members and staff, GARFO staff, and industry representation, enables a general budgeting of research projects by priority area. The review panel members most familiar with implementation of RSA grants have concerns that budgeting specific amounts for different priorities could reduce flexibility in awards, but ensuring the final mix of awards meet the Council priorities is important.

*The RSA review panel's recommendations 2.1 address concerns about priority setting.*

2. Perceived weaknesses and lack of transparency in proposal review processes. Some of the perceived weaknesses are:
    a. Some applicants for RSA grants think that technical reviewers do not understand the nature of their proposal or the research needed to achieve RSA priorities, and that in some cases, technical reviews are simply wrong. The RSA review panel did not examine individual technical reviews to evaluate their quality, but it is familiar with many scientists that review RSA proposals, and in general it considers them to be highly qualified and conscientious reviewers. It should also be noted that most applicants for RSA grants were satisfied with the quality of technical reviews. The panel notes that some degree of disagreement with technical peer reviews is normal, especially when there is scientific uncertainty about a particular issue..
    b. RSA applicants recommended for project selection are frequently asked to modify their proposals in response to technical or management reviews. This presumably improves the overall quality and relevance of RSA project science, but it was raised as a concern by some applicants that do not support requested modifications. This is a phase of the grants selection process that could improve from more transparency and communication about how modifications are needed to improve the overall package of applications selected for award approval to support management needs.
    c. Some stakeholders expressed concern that there were individuals with an appearance of a Conflict of Interest participating on Management Review Panels, which potentially biases selection of projects in favor of some grant applicants. However,

Federal government rules concerning conflicts of interest in the review of grant applications are strict and they are conscientiously applied to RSA. Nevertheless, RSA grant programs rely on a relatively small community of scientists and fishing industry stakeholders to enable the selection of the most technically sound and relevant proposals, and some of the informal relationships between these entities can create at least the appearance of conflicts of interest.

d. Contrary to c., other stakeholders expressed concern that Conflict of Interest rules were so restrictive that willing and qualified management panel reviewers, including industry stakeholders, could not participate, which negatively impacts the quality of the review process. They note that Fishery Management Council members with conflicts of interest are allowed to participate in Council debates concerning matters that affect them financially so long as they acknowledge their financial interest and recuse themselves from votes. However, similar degrees of financial interest disqualify individuals from participating in grant reviews. While the RSA review panel understands the nature of this concern, it also recognizes that the laws and policies that concern conflicts of interest are different for participation on Fishery Management Councils and for review of proposals for federal grants and contracts.
e. Some stakeholders expressed concern about lack of transparency and are suspicious of grant review processes because they do not know who exactly participates in the reviews. This lack of transparency about who is influencing the selection of grants is in stark contrast to the transparency of fishery management processes under the Federally mandated fishery management system that most fisheries related stakeholders are familiar with.

*While the RSA review panel respects the concerns described above, it concludes that in general the review process for RSA is consistent with broad Federal policies that apply to review of grant proposals and it is generally well done. Improvements have been made over the years to address concerns about the review process. Perhaps more could be done to better inform stakeholders about review processes and to address the potential conflict of interest described in Recommendation 2.2.*

3. Limited pool of RSA applicants and recipients. The pool of RSA grant applicants (i.e. scientists) and grant recipients is small, with a handful of scientists receiving most of the awards over the history of RSA programs. This is a concern because a larger pool of ideas and expertise might produce new approaches to solve difficult problems. However, the current pool of RSA participating scientists includes individuals with a tremendous amount of experience and knowledge about the RSA fisheries, good working relationships with RSA stakeholders, and excellent track records of contributing scientific expertise to fishery management processes (e.g., participation on Plan Development Teams). They also network with other scientists to access useful expertise that they do not have. Networking opportunities are very common within institutions, but also regularly occur between institutions. The universe of scientists involved in supporting RSA projects is much broader than the relatively short list of principal investigators that lead RSA projects.

   A key reason that the pool of scientists associated with RSA is small, is that RSA awards are compensation fishing opportunities, not monetary awards. Relatively few scientists have the

knowledge of operational aspects of fisheries and fishing industry contacts, or the inclination, to take on the challenges of monetizing RSA awards (fishing opportunities) to support research. It is likely that some research institutions are unwilling or unable to apply for fishing opportunities to be monetized to support research.

*The RSA review panel concludes that while a broader pool of scientific expertise with competing ideas to solve priority problems of RSA fisheries would be advantageous, the current pool of scientists and their networks of collaborators have an excellent track record of providing scientific information in support of fisheries management and building collaborative relationships with fishing industry stakeholders. There may be some additional opportunities for outreach that the Council and NMFS could consider (see Recommendation 2.3), but the review panel did not see this as a priority concern to address. The 3rd-5th alternatives under Recommendation 3 are also relevant to this concern.*

4. Awarding RSA fishing opportunities instead of monetary awards creates unique challenges for scientists and the fishing industry. There is uncertainty in the value of RSA fishing opportunities for all three RSA Programs with the greatest for Atlantic herring and least for sea scallops. Steps have been taken to reduce uncertainty, including setting price estimates as close as possible to the projected award date, consulting with economists, managers and the fishing industry to develop price estimates, and using flexibility in grants to address inaccurate price estimates.

   Nevertheless, monetizing RSA awards of fishing opportunities remains challenging because:
   a. In spite of efforts to predict the value of RSA awards accurately, there will always be some cases where predictions are inaccurate.
      i. In some years, more funds are generated than expected and there is insufficient guidance on how windfalls are to be handled. Based on feedback from grant recipients, revenues from compensation fishing in excess of the predicted revenues at the time of the award are either used for more research, or participating vessels retain higher compensation than anticipated, or somehow, they are "banked" for future years when the monetized value of RSA compensation falls short. In any case, it is unclear how well the use of windfall revenues fits the priorities of the Council.
      ii. In other years, the monetized value of RSA compensation fishing opportunities falls short of expectations, usually because the first sale price of the awarded species is lower than predicted, or in some cases the incentive to participate in RSA fishing is too low. The review panel understands that in some cases, the vessels conducting compensation fishing absorb all or part of the shortfall, perhaps adversely affecting crew shares. In other cases, it is necessary to scale back the research, which is done in consultation with NMFS, and it may result in a modification of the grant award. In some cases, there have been informal discussions between NMFS and NEFMC staff on the scaling back or modification of research as it relates to Council priorities, but this is ad hoc. There is no formal process for consultation with the Council when these decisions are made.

iii. Uncertainty in the monetized value of Atlantic herring RSA awards (and monkfish to a lesser extent) is particularly problematic because the Sub-Annual Catch Limits (ACLs) or monkfish Days at Sea (DAS) allowance that apply to the fisheries are not sufficiently limiting, which means that the awards may be significantly overvalued. RSA compensation fishing is exempted from some rules that apply to non-compensation fishing (e.g., for monkfish, some effort controls; for Atlantic herring, compensation fishing is allowed in an area closed to non-compensation fishing because the Sub-ACL has been caught). While this approach can be effective in generating revenue to support research, some of these exemptions may be perceived as contrary to presumably valid reasons for restricting or prohibiting non-compensation fishing.

b. There may be a delay between the time when RSA grants are awarded and the time when research can be initiated because it takes time for RSA fishing opportunities to be monetized so they can pay for research. This is particularly problematic for the monkfish and herring RSA programs, where significant uncertainty in price exists, and for institutions or scientists unable or unwilling to incur expenses that may not be refunded, prior to generating RSA funds. One result is that some projects are not completed on time, as originally planned. Granting an extension for completion of the project is generally not a problem, but a delay in project completion may be a problem if the results are needed as input to management decisions (See Recommendation 6)
c. The unique challenges of monetizing RSA awarded fishing opportunities almost certainly inhibit many researchers from pursuing RSA grants, resulting in a relatively small pool of potential scientists to address priority scientific needs (see Finding 2.3).

*The RSA review panel agrees that the challenges of monetizing RSA awarded fishing opportunities are real, and it has several suggestions to address these challenges under recommendation 2.4. While these suggestions could help, the challenges of monetizing RSA awarded fishing opportunities are an unavoidable aspect of RSA programs.*

5. Fairness in the ways RSA fishing opportunities are used. It is entirely up to the recipients of RSA grant awards to decide who they partner with to use compensation fishing opportunities. To monetize these fishing opportunities, they need to have an arrangement with one or more fishing vessels to catch and sell the fish so that research can be funded. Depending on the rules that apply to compensation fishing and the arrangement between the grant recipient and fishing vessels, compensation fishing may be less, equal, or more profitable than non-compensation fishing. Even when it is less profitable, it may be desirable when non-compensation fishing opportunities are not available to a vessel (e.g., it has exhausted its days at sea allocation). When compensation fishing is desirable, there will probably be more vessels that want to participate in compensation fishing than are needed. In some cases, vessels are selected by lottery from a large number of vessels, but not necessarily from the entire fleet. In other cases, researchers work with a relatively small group of vessels they are familiar with. Sometimes it is physical proximity between vessels and researchers that influence which vessels have the opportunity for desirable compensation fishing.

Regardless of how and why vessels are selected for desirable compensation fishing opportunities, this situation creates a potentially inequitable situation where grant recipients are determining access to a public trust resource with value that has been enhanced by management processes funded by the public. This concern relates to the concern about the appearance of conflicts of interest in management reviews described in Finding 2.c.

*The RSA review panel recognizes that different processes for selecting vessels for compensation fishing work for different RSA projects. It is clear that many grant recipients have invested significant time and resources into developing relationships and processes that enable them to effectively use their award. Allowing flexibility was considered central to their ability to manage their awards. However, if the Council is concerned about fairness in the distribution of desirable compensation fishing opportunities, the RSA review panel has some suggestions under Recommendation 2.5.*

6. Timeliness of RSA awards. Some RSA grant projects are awarded too late in the year for the research to be accomplished on the schedule tasks proposed in the grant application. In some cases, the award date is too late to carry out proposed research during the desired season (based on either seasonal cycles in the biology of species being investigated or for logistic reasons, e.g., to avoid harsh weather). The result may be that compensation fishing opportunities are undermined, and to a lesser degree in recent years, important scientific results are not delivered in as timely a manner.

   The timing of awards is largely determined by the date when the Council determines RSA priorities and the time required for NMFS to translate priorities into announcements of opportunities soliciting grant applications. Coordinating and executing the RSA programs is extremely demanding and requires a significant amount of staff resources and effort. In addition, the selection process is long, robust and competitive.

   *Appendix V of this report describes the timeline from priority setting to award of grants in more detail. Recommendation 2.6 suggests actions to address this concern about the timeliness of RSA awards.*

7. Lack of clarity about financial oversight of grants. RSA programs have generated tens of millions of dollars in revenues for the fishing industry and to support research. These revenues depend on the use of public trust resources and programs created and implemented using public funds (generated by taxes and appropriated by Congress). As in all Federal grant programs, financial oversight is important so that the public is assured that resources are being used as intended.

   Financial oversight of federal grants is performed by both the organizations receiving the grants and by the granting Agency (NMFS in the case of RSA Programs). Almost all Universities and foundations conducting research have rigorous auditing requirements to assure that all grant funds are accounted for and spent according to the terms and conditions of the grant. While universities are accustomed to receiving grants, small businesses are not. The administrative tasks and various reporting requirements for RSA grantees is large and the level of financial reporting may not be consistent. There are also limitations on what

information about grant awards can be shared with the Council and public, which may contribute to a perceived lack of financial oversight by some people with an interest in RSA.

The review panel was told that financial reports from grant recipients are received by NMFS, and that oversight has improved in recent years. The requirement for grant recipients to adhere to approved work statements and associated budgets seems to be understood since recipients sometimes request approval for modifying budgets. However, the review panel did not receive assurance from NMFS that financial reports from grant recipients were timely and complete and that there was a formal process to verify that approved budgets were adhered to. The level of detail seems to be inconsistent across RSA programs and grant recipients. Two impediments to more rigorous financial oversight by NMFS seem to be (a) complexities arising from the mis-match between grant awards issued in RSA fishing opportunities and budgets in dollars, and (b) the workload of the NMFS staff overseeing grants.

*While the review panel has no basis to believe there are any financial irregularities in RSA grant programs, and financial oversight has improved over the years, the bottom line is that financial oversight is a critical element of a successful RSA program and adequate resources are needed to assure compliance. Recommendation 2.7 addresses these concerns.*

8. Results are not feeding back into the management process as well as they could be. There are two aspects of this concern. One is that some RSA projects produce results that are not particularly useful for management. In fact, since the role of RSA is not clearly articulated (as discussed in Finding 3), it should not be alarming that not all RSA results feed into fishery management. If this is a concern, it should be addressed by better articulating the role of RSA and assuring that the RSA priority setting process produces priorities that are suitable and well specified to support the intended use.

   The other aspect of the concern applies to RSA project results that some think are useful to support fishery management, but have not been used to date. In some cases, the proponents of using these results may simply be wrong about their usefulness. In other cases, the laborious and time consuming processes that are in place to assure the quality of scientific advice cause delays in how soon new scientific information can be applied. While these processes may be necessary, they can also be frustrating. Finally, some of the delays or decisions not to use RSA project results to support fishery management may reflect a lack of shared understanding between the project proponent and NMFS scientists that usually lead the analyses that advise fishery management. These differences in views often relate to the type of information a project will produce, and how it will be used. In part, this problem is a consequence of the restrictions in place regarding the role NMFS scientists can play in the initiation of most RSA grant proposals (see Finding 2.10).

   It should be noted that a large portion of RSA project results are quickly incorporated in stock assessments and used as the basis for management specifications. In particular, this is the case for RSA projects that support sea scallop resource surveys. Sea scallop resources surveys account for more of RSA in terms of value than any other topic. This close connection between results of RSA projects and fisheries management probably reflects buy-

in to the importance of these projects by virtually everyone (stakeholders, RSA grant recipients, NMFS scientists conducting analyses to advise management, and fishery managers). There is a widely shared understanding of why these projects are important and how and when the results will be applied.

*Overall the RSA review panel found that the incorporation of RSA research has mixed results, with the majority feeding directly into the management process very efficiently, while some do not. Recommendation 2.8 promotes incorporation of RSA results into management.*

9. Inadequate access to data produced by RSA, and issues of ownership of data. RSA programs currently require that data be made available. According to the RSA website FAQ: *"In accordance with the NOAA Data Sharing Policy for Grants and Cooperative Agreements, environmental data and information, collected and/or created under NOAA grants/cooperative agreements must be made visible, accessible, and independently understandable to general users, free of charge or at minimal cost, in a timely manner (typically no later than two (2) years after the data are collected or created), except where limited by law, regulation, policy or by security requirements."*

   To date, this policy has not been consistently enforced. Some RSA recipients have been reluctant to share data because they intend to publish the results of their projects at some future date.

   Another concern is that some RSA projects generate huge amounts of data (particularly optical surveys of sea scallops), that are difficult and expensive to manage, store and transfer.

   *The RSA review panel agrees with this concern and discussed several possible improvements under Recommendation 2.9.*

10. Lack of collaboration among scientists participating in RSA grants and NMFS scientists. This situation arises because competitive federal grant processes must be fair. To avoid tipping the scale in favor of any grant application, NMFS scientists cannot participate in developing a project proposal (i.e., in generating the ideas behind the research, designing the research, or specifying the deliverables).

    Collaboration with NMFS scientists frequently occurs once a project has been identified for RSA project selection. This can occur formally through a cooperative agreement where NMFS staff serve as a project partner, or less formally. However, lack of collaboration between NMFS scientists and RSA grant recipients in the initial stages of conceiving and designing research, means that the scientists producing RSA results and the NMFS scientists that are usually responsible for using the results to generate scientific advice may lack a shared understanding of the information that is needed and how it can be applied. This situation exacerbates concern 2.8.

    Some stakeholders prefer that NMFS scientists have a limited or minimal role in RSA projects, but other stakeholders recognize that more involvement of NMFS scientists in all stages of research (from the initial idea to the application of results) could enhance the value

of RSA project results and the likelihood that they will be used as the basis for scientific advice.

*The RSA review panel believes that greater collaboration with NMFS scientists would be beneficial to the RSA process and outcomes. Recommendation 2.10 and some of the alternatives (3rd-5th) under Recommendation 3 address this concern.*

***Finding 3. The role of RSA is unspecified such that there does not seem to be a basis to decide what is, or is not, appropriate for support by RSA.***

There is a general understanding that RSA projects produce scientific information mostly (but not exclusively) intended to support fishery management. However, there are no criteria for deciding if a project should be supported by RSA or if it should be supported by another vehicle for funding research. Table 1 in the Section 2.3 of the Report identifies nine categories of information that might be addressed by RSA projects.

One extreme is to use RSA as an alternative to Federal funding for traditional mission activities of NMFS (e.g., resource surveys, stock assessments, long term ecological research, fishery dependent data collection). The other extreme is to use RSA solely to address issues aimed at making the fishing industry more profitable (e.g., new product development, more efficient fishing technology, marketing) rather than support for fisheries management.

To date, several of the categories in Table 1 have been addressed by RSA, arguably ranging from one extreme to the other. The RSA review panel heard a range of views about the appropriate role for RSA. There is probably some support for using RSA to address all the information categories, and there are also strong views about categories that should not be addressed by RSA. Recommendations 3 and 5 address the RSA review panel's finding about the role of RSA programs.

***Finding 4. Sea scallop surveys, which are the largest and most enduring RSA activity, lack an overall design, which likely does not optimize resources and scientific potential.***

As noted in Finding 2.8, sea scallop surveys are used to support management of the sea scallop fishery, and RSA support for these surveys is almost universally perceived as successful. The fact that sea scallop surveys are such an important reason for the success of the sea scallop fishery (among the most valuable in the Nation) and sea scallop management (e.g., low risk an overfished or overfishing status, broad stakeholder support), is all the more reason to make sea scallop surveys as good as they can be.

Currently NMFS pieces together a set of survey projects that it perceives as the best option given the proposals that have been submitted. This typically includes adjustments to proposed survey work to ensure important areas are covered, or elimination of unnecessary redundancy. In practice, once RSA survey coverage is identified, NMFS uses its own sea scallop surveys to fill in holes in the collection of RSA supported surveys. A long term survey strategy would be better served with consistent implementation of a structured design, similar to the approach taken in directed surveys of other federally managed species. The shortcomings of the current approach

have been pointed out in an industry organized review of surveys and an Agency external peer review of sea scallop surveys.

Several factors need to be considered in the design of sea scallop surveys:

1. Spatial coverage- As a result of the area rotational management approach applied to sea scallops, it is necessary to conduct both broad area (over the entire range of the resource) and local area (candidate areas for openings or closures) surveys on scallop density and size composition.
2. Sampling design- Currently both stratified random sampling and systematic sampling designs are used.
3. Sampling technology- Currently two different optical technologies are used, and dredges are used to physically sample sea scallops.
4. Sampling frequency- Broad scale sampling is mostly annual. The frequency of local area sampling is variable.
5. Sampling intensity- Most scientists agree that the sea scallop resource is one of the most intensively sampled (in terms of frequency and sample size) of any fishery in the USA (arguably the world). However, this sampling intensity seems to have evolved over time without analyses to determine how much sampling is enough, or too much (i.e., resulting in a small marginal value of information).
6. Models for assimilation of sea scallop survey data- NMFS has develop models that are suitable for analysis of the data currently produced by sea scallop surveys (both NMFS surveys and RSA supported surveys). The validity of applying these models to the available data has been confirmed by independent peer review. However, the RSA review panel is not aware of any analyses that demonstrate that the streams of data produced by recent sea scallop surveys are optimal for the models. It is also possible (perhaps likely) that there are alternative combinations of streams of data from sea scallop surveys and models that could produce more useful information in support of management, possibly at a lower cost. Sea scallop survey design should be considered in the context of models that assimilate the data.

An important impediment to implementing a rigorously designed model based program of sea scallop surveys is that a large portion of the sea scallop survey effort is supported by relatively short term (usually one or two years) RSA proposals that are submitted in response to grant solicitations that are non-specific regarding the survey design considerations above. It is the view of the review panel chair that using research grants to implement surveys may be problematic because grant solicitations are typically less specific about methods and deliverables than appropriate for implementing a long term standardized survey design.

*The RSA review panel addresses its findings on the shortcomings of the design of sea scallop surveys in Recommendation 4.*

***Finding 5. Implementing RSA programs generates a substantial administrative workload***. The workload associated with RSA programs is substantial. Significant time, effort and resources from NMFS and NEFMC staff, as well as technical/scientific reviewers and management review panel members, are expended prior to project selection. Administrative

costs are also incurred in the meeting time budget of Council groups (i.e., PDTs, APs, Committees and the Council) that participate in priority setting. Table 1 quantifies 2018 RSA grant activities, which gives an indication of the workload.

**Table 1. Estimate of workload for 2018 RSA grant activities, does not include all resources involved.**

| | Sea Scallops | Sea Herring | Monkfish |
|---|---|---|---|
| Priority Setting: Number of AP, PDT, Committee and Council Sessions | 4 | 4 | 4 |
| Number of priorities in Solicitation | 8 | 5 | 7 |
| Number of proposals submitted | 29 | 2 | 9 |
| Number of technical reviews | 111 | 6 | 27 |
| Number of management reviewers | 10 | 2 | 2 |
| Duration of management review meetings | 8 hours | 1 hour | 2 hours |
| Number of Grants Awarded | 15 | 1 | 3 |

This quantification does not take into account the time spent assembling a package of projects that best fit the need for sea scallop surveys, monitoring project research and compensation fishing activities, providing technical guidance and support for awarded projects, processing exempted fishing permits for compensation fishing and research, distributing project completion reports and promoting their use, supporting RSA outreach, assembling data from RSA for use in the preparation of scientific advice, and other activities that are necessary to fulfill the legal requirements of grants management and more broadly to make RSA programs successful.

*The RSA review panel suggests further evaluation of RSA program administrative capacity is warranted to determine where support is sufficient and where it needs to be increased (Recommendation 5). In addition, the RSA panel offers the 5$^{th}$ option under Recommendation 4 as a potential means to substantially improve management of the workload associated with RSA programs.*

***Finding 6. One or more of the current RSA programs may no longer be viable, but other species may be candidates for RSA programs in the future.***

There is no doubt about the success of the sea scallop RSA program. The workload generated by Atlantic herring and monkfish RSA programs is much less than for sea scallops, but nevertheless the RSA review panel thinks it is reasonable to question if RSA program costs for these species are worth the limited scientific and management advances. Key factors that distinguish these two RSA programs from the sea scallop RSA program are:

1. There is much less potential to generate revenues to support research from Atlantic herring RSA fishing opportunities, and to a lesser extent from monkfish RSA. There is also greater uncertainty about the revenues. Much of the value of RSA for these species depends on exempting compensation fishing from rules that apply to non-compensation fishing. The implications of these exemptions vis-à-vis the reasons for rules has not been critically examined. However, species committees responsible for FMPs considered the general impacts of specific exemptions. In addition, the Regional Administrator determines that compensation fishing exemptions are

consistent with FMPs and applicable laws prior to issuing compensation fishing permits. In practice, RSA compensation fishing varies from year to year in terms of when and where it occurs.

2. The importance (particularly in terms of fishery management) of the research being supported by Atlantic herring and monkfish RSA is less obvious than for sea scallops. Arguably, rotational area management of sea scallops could not function without RSA. The importance of Atlantic herring and monkfish RSA is less clear. In the case of Atlantic herring RSA, the river herring bycatch avoidance project is perceived by at least some members of the industry as necessary to prevent fishery closures and monkfish RSA has supported monkfish stock assessments.
3. A key element of the river herring bycatch avoidance project is shoreside monitoring of landings, which is needed to support industry bycatch advisories. This is a traditional governmental function, which may or may not be appropriate for RSA depending on one's views on the role of RSA.

The RSA review panel did not come to a conclusion about the future viability of the Atlantic herring and monkfish RSA programs, although some panel members were particularly skeptical about the viability of Atlantic herring RSA as currently constituted. The panel agreed that because monkfish and herring RSA programs have existed for years, this isn't enough of a reason to continue them. In this regard, the fact that RSA has not been used to address information needs for most species managed under NEFMC FMPs should not inhibit applying RSA to these species in the future. RSA may not be a good option for other species now (because of low ACLs, or ACLs that exceed current usage), but RSA may become a good option in the future, particularly if the value of RSA fishing opportunities is enhanced by exempting RSA fishing from some of the restrictions that apply to non-RSA fishing (as has been done in the current RSA programs).

*The RSA review panel suggests it is appropriate to be flexible in the Councils thinking about how and when RSA should be applied now and in the future. Recommendation 5 addresses this Finding.*

## RECOMMENDATIONS

***Recommendation 1. When it comes to making changes in NEFMC RSA programs, caution should be exercised not to "screw up a good thing."***

This recommendation is an acknowledgment of the importance of Finding 1. NEFMC RSA programs are successful. For sea scallops, RSA underpins successful management of one of the Nation's most valuable fisheries.

However, this recommendation is not intended to discourage changes that can make RSA programs even better. There are opportunities to improve these programs (see recommendations that follow). It is important to recognize that past success does not guarantee it in the future, particularly with constantly changing environmental, economic, social and legal conditions. The RSA review panel's warning not to ***"screw up a good thing"*** is especially related to the broad stakeholder support enjoyed by today's RSA programs. The NEFMC and NMFS should partner with stakeholders to design change processes that maintain stakeholder buy in.

***Recommendation 2. Several ideas for improving RSA programs that emerged during this review should be considered by the NEFMC and NMFS.***

The ideas that follow are organized to generally correspond to the concerns of Finding 2.

1. Inadequacies in priority setting processes: The NEFMC should consider:
    a. Investing more time and effort in the development of priorities and specific deliverables. Doing so during a single agenda item often scheduled at the end of a long meeting day may not be enough.
    b. PDTs working with NEFSC to draft language for each priority to specify the status and continued need as well as the deliverable(s) expected. This could include examples of research objectives and approaches to help guide applicants. This also could include near and long term research priorities to help inform grant duration. The PDT/NEFSC should identify what has been learned, what more could be gained, and help identify when it may be time to remove items from the list.
    c. Have a group with wider experience and less potential conflict of interest review RSA priorities. The SSC might be an appropriate peer review body for RSA priorities.
    d. Budgeting RSA fishing opportunities by topic rather than ranking priorities. This approach establishes a Council agreement on the program balance (i.e., the proportion of program resources that should be allocated to topics based on both priority and budget need) instead of program balance being determined by the outcome of the grants processes. The approach would reduce the risk of imbalances such as excess funding of top priority topics while under funding lower priority topics that are also important, although as noted under Findings, some panel members do not think imbalances are a problem. Budgeting by topic could be considered indicative rather than binding in order to maintain flexibility. Budgeting by topic would not dictate what proposals are submitted nor the technical merit or management relevance of the proposals, but it may help inform prospective applicants on potential funding potential.

e. Aligning RSA topics with an RSA mission statement if an RSA mission statement is prepared (see Recommendation 3).
f. Maintaining and routinely reviewing records of all stakeholder input to RSA (i.e. from PDT, Advisory Panel, Committees, and ultimately the full Council). This process does routinely occur but maintaining transparent documents that include this input over time could reduce concerns about potential conflicts of interest.

*2.* Perceived weaknesses and lack of transparency in review processes: NMFS should consider improving communication about the administrative processes used for review and selection of RSA grant awards, such as updating the RSA Frequently Asked Questions, and the FAQ link could be included in all program communications. Since the RSA review panel generally found that review processes are well done, better communications are the appropriate way to address this concern. It is also worth considering if there are ways to attract more members of the fishing industry to participate in management reviews and to address concerns about stakeholders that are willing to participate but may not be eligible because of financial conflict of interest rules. However, the review panel has no specific suggestions on this issue.

*3.* The limited pool of RSA applicants and recipients: NEFMC and NMFS could expand efforts to highlight opportunities to participate in RSA programs more broadly. One approach would be to use the Sea Grant network (in particular Marine Advisory Services) to inform potential RSA participants about RSA programs. Doing so might have the indirect benefit of encouraging RSA programs in other regions of the country.

As noted under Finding 2.3, the challenge of monetizing RSA fishing opportunities is a factor that limits the pool of RSA participants. Other recommendations (i.e., Recommendation 2.4) that address the challenges of monetizing RSA fishing opportunities are also relevant to the concern about a limited pool of participants).

4. The unique challenges created by awarding RSA fishing opportunities instead of monetary awards:
    a. To address the uncertainty and unpredictability in the value of RSA fishing opportunities, NMFS should
        - In consultation with the Council, establish standard procedures on how to specify value estimates for each program.
        - In consultation with the Council, identify existing or potential mechanisms that could be used to respond to inaccurate price estimates and potential award adjustments. Establish procedures and guidelines around when and how these mechanisms would be used. Develop guidelines for re-evaluating price estimates for multi-year grants.
        - Consider allowing the transfer of RSA quota or DAS between years to address inaccurate price estimates.
        - Consider reserving a portion of RSA quota or DAS that could be added to project awards to offset low price and value estimates.
        - Consider additional compensation fishing incentives and flexibilities that will help reduce uncertainty (e.g., remove area specific RSA quotas so award

could be fished in any area; make monkfish RSA a fixed number of pounds instead of DAS).
- Consider more formal process between NMFS and NEFMC when awarded RSA projects need to be modified to help ensure the modifications are in line with Council priorities.

*b.* To increase the value of RSA fishing opportunities so that more research can be supported, NMFS in consultation with the NEFMC, should consider:
- *For sea scallops,*
    - *Allow transfer between years (or further extend the 3 month RSA carryover provision).*
    - *Feasibility and benefit of periodically Increasing RSA amount (especially when total scallop harvest levels are relatively high) to create an RSA reserve that could be awarded to grant recipients and harvested at a later date.*
    - *Allow harvest of scallops in certain areas or under certain situations for RSA only when it is not feasible to harvest them for the general fishery. For example, the smaller scallops in deep waters in Nantucket Lightship may not be suitable for normal fishery access. If those scallops are not allocated to the fishery, maybe they would be appropriate for RSA. RSA of small deep water scallops would probably be less valuable per unit weight than other RSA, but the approach might generate additional RSA revenue without reducing the amount of larger scallops available for non-RSA fishing.*
- *For monkfish,*
    - *Exempt vessels on monkfish RSA trips from skate possession limits or other species (e.g., groundfish).*
    - *Change monkfish RSA from DAS to fixed pounds.*
    - *Allow transfer of RSA DAS/pounds between fishing years.*
    - *Ways to expand the pool of vessels eligible to conduct monkfish RSA compensation fishing when the demand by currently eligible vessels is not adequate to use RSA DAS and support research budgets.*
    - *Additional effort control exemptions that could incentivize monkfish RSA compensation fishing.*
- *For Atlantic herring,*
    - *Allow transfer of pounds between fishing years (or rollover if transfer is not possible)*
    - *Set RSA that is not attributed to specific management areas (or allow transfer of pounds between areas).*
    - *Reserve haddock and river herring under catch caps to enable RSA compensation to continue when caps are met by commercial fleet.*
    - *Consider additional effort control exemptions such as days-out, 1A seasonal gear prohibitions.*
- *For all RSA species*
    - *Use some of choke stocks as RSA since they may be more valuable than target species. Using choke stocks as RSA has the potential to*

*generate substantial research support, but several factors would have to be considered before applying the approach. This approach would be relatively straight forward if there are individual vessel or sector allocations of choke stock, but it is unclear how the approach would work for a sub-ACL that is available to a large pool of vessels. Also, the value of RSA for choke stocks should be considered relative to the potential negative impact on non-RSA fishing which would be more constrained by its catch of a smaller amount of choke stocks.*

- *Review the RSA set-aside amount and compensation fishing performance periodically (e.g. every five years).*
- *Encourage compensation from all species landed during RSA compensation fishing trips, not just RSA species (i.e. mackerel on herring trips and skate on monkfish trips). Making it clear that such arrangements are allowed may be helpful.*
- *Create an on-line tool to facilitate auctioning for RSA fishing opportunities by RSA awardee (see 5c). Depending on the design, transactions could be solely between the RSA awardee and the successful bidder, thus minimizing or eliminating transaction costs.*
- *Review and compare compensation fishing allowances between FMPs to ensure general consistency of incentives and flexibilities.*

The RSA review panel wants to be clear that all of these ideas for potentially increasing the value of RSA are ideas for future consideration, and they are not consensus recommendations of the panel. The RSA review panel is not necessarily advocating any of these specific ideas because it has not analyzed their implication relative to management objectives of the Fishery Management Plans that might be impacted.

5. <u>Fairness concerns in the ways RSA fishing opportunities are used</u>: As a first step to address this concern, the Council should make it clear if it wants RSA fishing opportunities to be shared fairly when there are more vessels that want to participate in compensation fishing than there are opportunities. This could be done in a mission statement for RSA (see Recommendation 3).

   While the RSA review panel believes it is appropriate for the Council to express its desire for fairness in participation in RSA programs, additional steps in response to this concern should be based on an evaluation of how RSA fishing opportunities have been used. Who has received them? Is there an acceptable explanation for the historic distribution of RSA between vessels? What are the processes that RSA award recipients use to decide who should conduct compensation fishing, and why? How do approaches vary between programs?

   When the magnitude and nature of the problem (if any) has been documented, it should be feasible to design tools and rules for improving fairness in the future. For example:

   a. Equitable access to RSA fishing opportunities could be included in grant solicitations as an objective (and as an evaluation criteria), and grant awards could include requirements for the distribution of RSA fishing opportunities.

b. Meetings between RSA grant recipients and vessels interested in compensation fishing could be hosted by NMFS and NEFMC.
c. An on-line system might be developed to assist connections between RSA grant recipients and vessels interested in compensation fishing.
d. The system in 5.c could be expanded to facilitate an on-line auction between grant recipients and the fishing industry. The system could list compensation fishing opportunities and fishing vessels could bid (how much they are willing to pay either as an absolute amount or fraction of first sale revenue) on the opportunity to use them. Unlike the situation with MAFMC RSA programs where there was a third party that auctioned RSA fishing opportunities for a fee, transactions resulting from such a website would be solely between the RSA award recipients and the compensation fishing vessels. There would be no transaction fee. This approach could expand industry participation potentially increasing the funding available for research (see Recommendation 2.4).

6. Timeliness of RSA awards: NMFS and NEFMC should prepare a detailed time table for the steps from priority setting to awarding RSA grants. The time table should be examined with a view toward reducing the time between steps. The NEFMC should consider initiating the priority setting process earlier in the year, particularly if the priority setting process becomes more intensive. Also, there may be merit to staggering the annual cycle of RSA awards for the three species.

7. Lack of clarity about financial oversight of grants: The RSA review panel reiterates that it is not aware of any accounting irregularities by any RSA participant, but achieving a high degree of confidence in the financial integrity of RSA programs is important. The RSA review panel does not think it is appropriate for it to specify how financial oversight should be improved, but it recommends that NMFS conduct an internal audit of its financial oversight procedures and strengthen them as appropriate.

8. Results are not feeding back into the management process as well as they could be: Utilization of RSA results in the management arena is mixed. Some results feed directly into management and the assessment process very efficiently, but some do not. It takes time and resources from the Council, NMFS, and RSA recipients to track and ensure RSA results are fully integrated. Some ideas to encourage integration of RSA results are as follows:
    a. For sea scallop RSA survey projects, a post award meeting could be scheduled to share and review survey plans. This could be held in April after awards are made and before the survey season begins. It may be possible to evaluate and adjust survey plans to create a more effective overall survey strategy and to integrate the NEFSC survey plan at this stage as well.
    b. An Advisory Committee could be established for each award with NMFS/Council staff, and maybe others, to provide input throughout the project on ways to increase utility of the project and to identify ways the results can be integrated more effectively. If this process is too cumbersome, at a minimum one NEFSC staff person could be assigned to each project to identify if there are ways to enhance utility of results.

c. A separate more general Committee could be established to enhance monitoring and tracking of RSA results more intensely than the current system used (NMFS/Council staff track projects). Or additional NMFS/Council resources could be dedicated to conducting project oversight and facilitating technical support.
d. More formal communication of progress reports could be shared with PDT, Advisory Panels, and Committees to improve monitoring and accountability of RSA awards.
e. Applicants could be required to specify the anticipated impact of project results if awarded RSA.
f. The Council has been hosting annual "Scallop RSA Share Days" to provide a forum for RSA results to be shared with the Scallop PDT and advisory panel. Over the years improvements have been made to this process to help ensure that the presentation of results is consistent and efficient (Appendix VIII). These periodic meetings could be considered for Atlantic herring and monkfish plans as well. Additional deliberation on the goals and objectives for RSA share days should be considered by the Council and NMFS.
g. There could be periodic subject based updates on the status of RSA research. For example, what have we learned from several RSA awards on scallop incidental mortality or sea turtle research? Subject based RSA workshops would add to the Council and NMFS staff workloads unless they are held as part of a cooperative agreement with its own support staff (see the 5th option under Recommendation 4).

9. Data generated by RSA funded projects has not always been made available to the public in a timely fashion: Some ideas to enhance data availability are as follows:
    a. The data sharing policy and rights of data ownership should be clarified in the FFO and on the RSA website.
    b. There is currently no formatting requirement in the NOAA Data Sharing Policy for Grants and Cooperative Agreements. Data derived from RSA funded projects is public property and should be made available in a consistent format such as ACCSP, in a publicly accessible database. The RSA review panel recognizes that data warehousing will require additional resources. One possible solution would be to build data warehousing costs into accepted proposals, based on the anticipated needs of each project.
    c. NMFS and the Council should develop an annual report to summarize the status of RSA projects (e.g. annually or biannually via newsletter).

10. Lack of collaboration among scientists participating in RSA grants and NMFS scientists: NMFS should further encourage its scientists to be collaborators on projects supported by RSA programs and make it feasible by establishing more cooperative agreements to implement RSA projects so that NMFS scientists can be full partners from inception of research to the application of results. In addition, having Advisory Committee meetings for RSA projects with NMFS staff described in Recommendation 2.8 could improve collaboration as well.

***Recommendation 3. To clarify the role of RSA, the NEFMC should adopt a mission statement for RSA.***

The RSA review panel does not have a consensus recommendation on the content of a mission statement, but it might include:

1. Fulfilling gaps in scientific information to support NEFMC FMPs when information needs are beyond the scope of NMFS's' traditional role of monitoring and assessing fisheries. For example, RSA programs could provide higher spatial and/or temporal resolution data to inform area rotation management. Providing scientific information to help to minimize the negative impact on fisheries of regulations that result from non-fishery management mandates (e.g., ESA, MMPA).
2. Instilling confidence and a sense of ownership in scientific information and fishery management.
3. Fostering cooperation and collaboration between the fishing industry and scientists, including NMFS scientists.
4. Improving the precision of scientific advice and the certainty of management implementation such that scientific and management buffers are reduced.
5. Scientific studies that can realistically deliver results applicable to management within about 5 years.

Some activities that might be explicitly excluded from an RSA mission statement might be:

1. De-facto funding for traditional government missions of monitoring and assessing fisheries
2. Support for research intended to compete with or discredit NMFS scientists,
3. Research that is not aimed at contributing to Fishery Management with a realistic likelihood in the foreseeable future.
4. Research priorities that cannot be realistically addressed within the financial scale of research that can be supported by RSA.

The Mission Statement might be accompanied by an RSA policy that indicates the NEFMC desire that RSA fishing opportunities be shared fairly among fishing vessels that are capable and want to participate in compensation fishing. There are likely to be additional important policies that will be identified during the preparation of a mission statement for RSA programs.
It is not appropriate for the RSA review panel to propose a specific mission and policy for RSA programs since these should emerge during a broad Council dialog about RSA that is inclusive of stakeholders. The ideas above are intended to stimulate a dialog, not limit it. An omnibus RSA Amendment as indicated in Recommendation 5 would generate a transparent process with broad participation for preparing an RSA mission statement and accompanying policies.

***Recommendation 4. A series of options for improving the efficiency and effectiveness of resource surveys for scallops should be considered***. These options include:

1. ***Improvements that can be made that are within the general scope of the current RSA approach*** include:
    a. There could be annual meetings to coordinate survey activity after selection or awards are made beyond what currently occurs between NMFS and grantees,

b. NMFS could explore expanding the role of the scallop survey technical review panel to more broadly consider scallop survey design and survey implementation.
c. Extend duration of multi-year grants (up to 5-years) to facilitate stability in sea scallop survey design. Currently multi-year awards are limited to the amount of years of the scallop specifications. A modified approach would be to award several survey methodologies with options up to five years and revisit the locations of the surveys each year by engaging an established survey panel. The option elected would state the survey location and intensity, and the revised fair market value of the price per pound of scallops needed to conduct the research.
d. Recommendation 2.8 has additional ideas aimed at increasing the use of RSA results. Some of these ideas apply to sea scallop surveys.

2. ***Re-establishing the Scallop Survey Advisory Panel with the primary charge of designing an overall strategic approach for sea scallop surveys.*** A Scallop Survey Advisory Panel was abandoned years ago, presumably because it was ineffective. However, with heightened attention focused on the efficiency and effectiveness of sea scallop resource surveys as a result of this RSA review, such an advisory panel might be more effective. This panel, in conjunction with the management review panel, would help recommend the next year's survey location based on the needs as addressed in the Council priorities.

3. ***Using an RSA supported cooperative agreement to prepare a statistically rigorous (i.e., model based) design for Sea Scallop Surveys.*** The design should address all of the design considerations given in Finding 4. (i.e., spatial coverage, sampling design, sampling technology, sampling frequency, sampling intensity, modeling).

   A statistically rigorous (model based) design will fulfill two needs. Firstly, it provides a quantitative basis for deciding between alternative designs in terms of the contribution of survey data to the accuracy and precision of scientific advice. Secondly, it provides an objective basis for deciding between competing survey methodologies and approaches. Note that the outcome might be that multiple methodologies and approaches are appropriate for surveying scallops, but this should be the outcome of a design study, not a legacy of the way sea scallop surveys have evolved over the last two decades.

   A cooperative agreement is proposed as a financial instrument to support a sea scallop survey design study because it is a way of engaging both NMFS scientists and independent scientists in the study. It is essential that both are fully engaged and share ownership of the results if they are to be broadly credible and applied.

***4. Use a relatively long term cooperative agreement to design and implement Sea Scallop Surveys***. It is likely that the outcome of a sea scallop survey design study will result in a lot of more detailed specifications about how surveys should be conducted than has been included in the scope of work in RSA grant solicitations to date. Typically, an important element of the competition for federal research grants is a competition of ideas on how to fulfill scientific objectives. A proposal to carry-out a highly specified survey and deliver

data to be assimilated by models that are part of the overall design is not research. This is typically the type of deliverable vendors are contracted to deliver.

Solicitation for a cooperative agreement could indicate that the scope of work is to prepare a statistically rigorous (model based) design for sea scallop survey and implement them in cooperation with the NEFSC and NEFMC. Competition for the cooperative agreement would probably be based on the experience, qualifications, and the track record of the team (it can be more than one institution) that the applicant assembles to address the scope of work (i.e., design and implement sea scallop surveys), in addition to any other requirements identified in the scope. For example, the solicitation would probably require applicants to identify a cooperative agreement governance structure that would engage stakeholders, recognize the authority of NMFS when it comes to expenditures, and respect the advisory role of NEFMC. There would also be budgetary considerations addressed in the solicitation, review process, and award of the cooperative agreement. The process to be used to monetize RSA fishing opportunities should also be addressed in the scope of work and applications for the cooperative agreement.

With a cooperative agreement in place, a team of scientists could design sea scallop surveys subject to oversight by the cooperative agreement governance structure. Once the design is agreed, surveys could be implemented under the terms of the cooperative agreement.

5. ***Establish a long term Cooperative Agreement for Research Set Aside Programs (CARSAP).*** This is a logical next step to follow number 4 above. NOAA has many long term cooperative agreements to address broad subject areas. NMFS had cooperative agreements with several of the institutions that participate in RSA projects and some of them currently participate in a NOAA Cooperative Institute for North Atlantic Research (CINAR). This approach has several potential advantages:
    a. CARSAP could be relatively long term. NOAA cooperative agreements analogous to CARSAP are typically five year grants and it is common for them to be renewed for decades.
    b. CARSAP would create a governance structure that defines the roles of industry stakeholders, Cooperative Agreement PIs, NEFMC representatives, and NMFS representatives.
    c. NMFS scientists could participate in CARSAP projects from the initial idea to the application of results.
    d. The administrative burden might be reduced by having one or a few long term cooperative agreements instead of numerous short term grants. Some of the administrative burden of RSA might be borne by the staff of CARSAP. Funding for this administrative workload could be supported by RSA revenue, contributions by NMFS and/or contributions from the Council. These contributions would be offset by the savings in RSA workload.
    e. CARSAP with broad collaboration along the lines envisioned could attract Congressional support.

f. CARSAP could conduct planning processes such as designing and agreeing on a long term strategy for scallop surveys, including NMFS surveys. The strategy could maintain the flexibility required to address the needs of rotational area management and unforeseen events.
g. Having a single CARSAP or few cooperative agreements would make it easier to provide financial oversight since there would be fewer entities to audit.
h. CARSAP could design approaches to monetizing RSA fishing opportunities that are transparent and fair, well documented and provide a buffer for the fluctuating value of fishing opportunities (e.g., "banking revenues when the price is high to offset expense when the price is low).
i. Establishing CARSAP could foster cooperation between the current institutions that are the primary competitors for RSA awards. They could team up to submit a joint proposal. NOAA cooperative agreements commonly include several cooperating institutions.
j. CARSAP would have more flexibility in the mechanism for secondary distribution of funds or RSA fishing opportunities to implement agreed projects than what is currently allowed under the rules that govern NMFS implementation of RSA programs.
k. It would be worthwhile to consider how to design the CARSAP so it could accept private sector funding for projects that are consistent with its agreed purpose (according to the cooperative agreement).

*There is no consensus on the review panel on which of option (s) is preferred. They are not in priority order. The options are listed in the order that reflects the degree of change from the status quo.*

***Recommendation 5. NMFS, in consultation with the Council, should evaluate and document RSA program administrative capacity to determine where support is sufficient and where it could or should be increased. While some components of this recommendation are recognized elsewhere in this report, the RSA review panel supports a dedicated evaluation of resources available and/or needed to ensure RSA programs are functioning as well as possible. Areas of focus should include:***

- RSA competition administration.
- RSA compensation fishing and research permitting administration and oversight.
- RSA award financial oversight.
- Technical guidance and oversight of awarded projects, including: Greater consideration of research results and upcoming research needs during the priority setting process; greater transparency and support for technical input and guidance at the project selection phase; greater engagement with projects throughout the life cycle of the grant, and; increased oversight of ongoing and recurring projects to increase accountability for longer term projects.
- Access to RSA project data and results.
- RSA program outreach needs.
- RSA grant report review processes and timeliness.

***Recommendation 6. The NEFMC should consider preparing an Omnibus FMP for Research Set Aside Programs that would be available for all fisheries under the jurisdiction of the Council.***

The Omnibus Plan could include:

1. Codification of the role of RSA and principles to guide the application of RSA.
2. Description of processes to be used for implementation of RSA projects.
3. A flexible procedure (analogous to annual specifications) for deciding when and how much catch should be allocated to RSA projects for any FMP, as needs and opportunities arise.

Preparation of an omnibus RSA FMP would assure broad, transparent participation in the process of defining the role of RSA, establishing policies and agreeing on mechanisms for implementation.

## RELATIONSHIP BETWEEN FINDINGS AND RECOMMENDATIONS

Table 2 below cross-references findings and recommendations. Entries in the cells of the Table indicate which recommendations address each of the findings. Some recommendations address multiple findings. There are separate columns to indicate if the NEFMC or NMFS should take the lead in implementing the recommendation. In a few cases, there are table entries for both the NEFMC and NMFS indicating that they should be co-leads. Recommendation 4, option 5 could be used to address several of the findings depending on the design of a cooperative agreement for RSA. It could also be an umbrella for carrying out several other recommendations.

**Table 2. Cross-reference between Findings and Recommendations.**

| Finding | Recommendations: NEFMC Lead | Recommendations: NMFS Lead |
|---|---|---|
| 1. RSA Performing Well | 1 | |
| 2. Concerns | - | - |
| 2.1 Priority setting | 2.1 | |
| 2.2 Review Process | | 2.2 |
| 2.3 Limited pool of participates | | 2.3, 2.4 |
| 2.4 Challenges of monetizing RSA | 2.4 | 2.4, 4.5 |
| 2.5 Fairness is access to RSA fishing | 2.5 | 4.5 |
| 2.6 Timeliness of awards | 2.6 | 2.6, 4.5 |
| 2.7 Financial oversight | | 2.7 |
| 2.8 Application of results | 2.8 | 2.8, 4.5 |
| 2.9 Access to RSA generated data | | 2.9 |
| 2.10 Collaboration with NMFS scientists | 2.10 | 2.10, 4.5 |
| 3. Role of RSA unspecified | 3, 6 | |
| 4. Sea Scallop surveys lack overall design | 4 | 4 |
| 5. Substantial administrative workload | | 4.5, 5 |
| 6. Viability of RSA for some species | 6 | |

## 7.0 REFERENCES (STILL UPDATING)

NEFMC, 2006. Amendment 1 to the Herring FMP, FEIS, 713 pages. https://s3.amazonaws.com/nefmc.org/FINAL.A1.FSEIS.MAY.3.06.with.index.FINAL.pdf

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NEFSC, 2018. Draft 2018 Benchmark Assessment, SARC65. https://www.nefsc.noaa.gov/SAW-Public/SAW-SARC65/B.herring/working%20papers%20for%20review/