



National Response to the FY 2015 Reviews of NOAA Fisheries' Protected Species Science Programs

Background

Scientific integrity is a fundamental element of the process by which NOAA delivers the best available science and earns the public's trust in our science and management. To this end, NOAA drafted a policy to uphold scientific integrity principles contained in the President's March 9, 2009, Memorandum and in the December 17, 2010, Memorandum on Scientific Integrity¹ from John Holdren, Office of Science and Technology Policy Director. Peer review is an essential element of this policy and these reviews are an opportunity for scientific exchange, maintaining and improving standards, improving performance, and increasing scientific credibility.

Peer reviews are an important feedback mechanism needed to provide fresh ideas and improve fisheries science programs. The National Marine Fisheries Service (NOAA Fisheries) provides opportunities for peer reviews at multiple levels (<http://www.st.nmfs.noaa.gov/science-quality-assurance/index>) and uses a suite of processes to ensure the quality of its scientific products including:

- Internal peer review of Fundamental Research Communications (including both internally and externally published scientific manuscripts, abstracts, and other media);
- External review of fishery stock assessments;
- External review of marine mammal stock assessments; and
- External review of Centers' scientific programs.

Historically, all NOAA Fisheries Science Centers and the Office of Science and Technology (OST) have individually conducted reviews of elements of their science programs on an ad hoc basis. NOAA Fisheries added the Science Program Reviews² in FY 2013 as the overarching and systematic, national approach to peer review that ensures the NOAA Fisheries science enterprise is being properly conducted. This approach complements NOAA's Science Advisory Board and its Ecosystem Science and Management Working Group, which provide overarching thematic reviews of NOAA science by adding advice geared toward specific topics relevant to the NOAA science portfolio. Through continued use of this agency-wide peer-review process NOAA Fisheries will more effectively maintain a high level of scientific quality, advance its science nationally, and provide guidance for future science investments.

This document serves several purposes:

- Provides an overview of how NOAA Fisheries' Science Program reviews were conducted in FY 2015;
- Summarizes the key issues reviewers identified during the FY 2015 reviews; and
- Presents a national-level response for those issues identified during three or more of the reviews. Our response, like the responses provided by the individual Science Center or OST Directors, will address the annual review topic, once all reviews are completed for the year.

¹ <http://nrc.noaa.gov/ScientificIntegrityCommons.aspx>

² <http://www.st.nmfs.noaa.gov/science-program-review/>

The FY 2015 Science Program Reviews

The Science Program Reviews, developed in FY 2011, are a new approach to the NOAA Fisheries peer review process and provide the ability to compare science programs across all regions simultaneously. As a part of this process, a national strategic planning effort (as a baseline for the reviews) was conducted in FY 2012 to facilitate the incorporation of results from the program reviews into operations.³

During FY 2012, the individual Science Centers and OST developed a five-year schedule for the program reviews:

- FY 2013 - Data used for fishery stock assessments
- FY 2014 - Fishery stock assessment process
- FY 2015 - Protected species data and science
- FY 2016 - Ecosystem approaches to management, climate, and habitat
- FY 2017 - Economics and social sciences

Fishery stock assessment reviews were split into two years (data and the assessment process) to ensure each received substantive feedback.

The Science Center and OST Directors worked with OST staff to develop terms of reference⁴ for the FY 2013-15 reviews. The focus of the 2015 program reviews was protected species science conducted under two primary mandates - the Endangered Species Act (ESA) which covers marine mammals, sea turtles and fish, and the Marine Mammal Protection Act (MMPA). Each Science Center refined the terms of reference to meet their specific needs.

The six reviews for FY 2015 were scheduled between March and August 2015 as follows:

- Alaska Fisheries Science Center – March 16-20, Seattle, WA
- Northeast Fisheries Science Center – April 13-16, Woods Hole, MA
- West Coast salmon and other ESA listed fish – May 4-8, Seattle, WA
- Pacific Islands Fisheries Science Center – July 27-31, Honolulu, HI
- West Coast marine mammals and turtles – July 27-31, La Jolla, CA
- Southeast Fisheries Science Center – August 24-29, Miami, FL

The Northwest Fisheries Science Center and Southwest Fisheries Science Center chose to conduct joint reviews of Pacific Coast protected species science programs, as the two Science Centers share responsibility for many protected species in the California Current and its watersheds. Although the OST protected species science activities are growing they were insufficiently large to warrant a stand-alone review during this review cycle.

Review panels were chaired by a non-NOAA Fisheries scientist, and generally included:

- One scientist from NOAA Fisheries (but not from the Science Center conducting the review);
- One scientist from another NOAA line or staff office (optional);
- Three to five (the majority) scientists external to NOAA; and
- One Science Center Director (optional, and not from the Science Center conducting the review).

All Science Centers provided their panelists with briefing materials and background documents approximately two weeks prior to the start of the review (documents are available on the regional websites).

Reviews typically began with at least a half-day of background presentations on the roles and responsibilities of the individual Science Center. The next two to three days were devoted to presentations by the Science Centers' staff on the various protected species assessment programs and assessment methods used by the Science Centers (e.g., surveys, modeling approaches and peer review processes). Presentations typically ended by early afternoon to allow the panel time for discussion. Public comment was solicited daily at the end of presentations. The public component of the reviews concluded with at least one day for panel follow-up discussions and report writing ended with a debriefing by the panel for the Science Centers' Directors, Leadership, and Headquarters representatives.

³ <http://www.st.nmfs.noaa.gov/strategic-plan/index>

⁴ <http://www.st.nmfs.noaa.gov/science-program-review/program-review-reports/index>

Following the review, the Panel Chair prepared a summary report of the meeting and submitted it, with the individual panelists' reports, to the Science Center Director. The Director forwarded these reports to the NOAA Fisheries Chief Science Advisor, along with a brief response to the Chair's summary report, usually within ten weeks of receiving the report package. The Science Center Director's response included action items, timelines and clarifying information, and sometimes responded to specific points within individual reports.

Generally, within three months of the close of the review, all documents (Chair's summary report, Director's response, and individual reviewers' reports) were posted on the Science Center and OST program review websites (<http://www.st.nmfs.noaa.gov/science-program-review/program-review-reports/index>).

Summary of Findings from the FY 2015 Reviews

The reviewer reports uniformly praised NOAA Fisheries Science Centers and their staff for the commitment to conducting cutting edge science in world class programs despite the logistical challenges of covering diverse species over vast geographic areas in the face of dwindling resources. Also noted was the time and effort staff put into producing high quality presentations of their work and answering reviewers' requests for clarifying information. Most of the recommendations from the reviews focused on the enterprise of individual Science Centers or programs with shared responsibility, but there were also crosscutting national themes that we respond to here. Recommendations made at three or more of the reviews are listed below, together with national-level responses. Although ESA listed fish species were only covered in two reviews, they are included in the crosscutting recommendations where appropriate.

Prioritization of Science and Management Needs

The need to ensure that research funding priorities are addressing management needs is important, especially when funding is in short supply. The importance is further heightened when information needs far outstrip the resources available to meet those needs. In such a situation, strategically prioritizing research funding to address the most pressing management needs is critical.

Recommendations: Reviewers highlighted the need for Science Centers to prioritize the science and research needed to address the management needs of their Regional Offices. The needs and priorities of the Regional Offices are a key driver of Science Center research, but not the only driver. Reviewers recommended that the Science Centers take a clear, transparent look at the research priorities and how they meet the needs and priorities of the Regional Offices. The reviewers also recommended that the Science Centers look beyond the traditional needs of management to the management needs created by changing systems (e.g., climate change, increasing ocean noise) and to novel ways of providing management advice (e.g., multispecies assessments, alternatives to the resource-intensive population and mortality assessments).

Reviewers also noted that, in some cases, the division of responsibilities between the Science Centers and the Regional Offices was inconsistent, leading to confusion and inefficiency. The reviewers recommended that the Science Centers and Regional Offices take a deliberate and strategic approach towards formalizing the roles and responsibilities for each region.

Response: This issue was identified at several of the Centers' reviews. We agree with the reviewers' recommendations and propose to address the concern through the institution of a formal prioritization process that will be conducted jointly by the Science Center and the Regional Office in each region on an annual basis, to interleave their respective science priorities into an agreed upon operational plan for the year.

Historical program structures and funding lines are an impediment to proper alignment between science and management functionality. This combined with restructuring of funding lines presents NOAA Fisheries with a unique opportunity to step back and identify the optimal way to allocate funds to address both science and management priorities. NOAA Fisheries Leadership, Science Center Directors and Regional Administrators, OST and the Office of Protected Resources (OPR) need to work together to create a new vision for protected species science and management.

Action items:

- OST staff will continue to support Science Center, Regional Office and OPR staff, as needed, to develop improved ways of providing management advice (e.g., a national Ocean Noise Strategy and policy, the protected species climate vulnerability tool, the Regional Climate Science Action Plans).
- NOAA Fisheries Leadership, Science Center Directors and Regional Administrators, OST, and OPR will work together to review the division of the responsibilities at headquarters and in each region to clearly delineate the roles and responsibilities of the Science Center/OST and the Regional Office/OPR. Regional leadership will be encouraged to update their Operating Agreements to better describe the roles and responsibilities of the Science Centers and Regional Offices.
- The NMFS Protected Resources Board has implemented an annual exercise, now overseen by OST; whereby each Science Center will work with their corresponding Regional Office to further revisit and revise their joint strategic planning efforts. Results of this annual effort will be more fully implemented into the revision of all Science Centers and Regional Offices' Strategic Plans contemplated for FY2018.
- Finally, Headquarters will continue to work with regional leadership to review and address the allocation of protected resources funding between science and management needs.

Greater Coordination and Collaboration on Technology, Surveys, and Methods

Reviewers recognized a need to increase coordination and collaboration in several areas including advanced technology, surveys, assessment methods, and information management. The need was identified on several levels including:

- Among all Science Centers and Regional Offices;
- Between and within each Science Center's Divisions and Programs; and
- Between Centers and various external partners including other international agencies and groups, federal agencies, state agencies, academic partners, nongovernmental organizations, and traditional knowledge groups such as native hunters.

Recommendation: Reviewers commended the rich and valuable partnerships and collaborations that enable the Science Centers to produce impressive and comprehensive bodies of work with limited funding and resources. However, they also saw room for improvement. Reviewers felt that increased communication and collaboration among Science Centers could lead to coordinated research projects and shared innovations, increased collaboration across divisions and programs could lead to increased efficiencies and benefits associated with an interdisciplinary approach to research, and increased coordination and collaboration with external partners would allow the Science Centers to continue to maximize the research possible on limited budgets.

Response: We agree with reviewers' recommendations and see the value in improving coordination and collaboration at multiple levels. Building relationships can be time-intensive but, when successful, these relationships can allow for increases in efficiencies and leveraging of limited resources. We agree that these relationships should be strengthened where they exist and created where they do not, and that staff should be encouraged to make the efforts necessary for the relationships to thrive.

Action Items:

- In FY2017, NOAA Fisheries will begin to support a biennial Protected Species Assessment Workshop (analogous to the National Stock Assessment Workshop) to bring scientists from each region together to exchange data, methods, and technologies, establish best practices, and ensure consistency. The theme of each workshop will vary but will include topics that provide opportunity for exchange across disciplines including the social sciences. These meetings will also bring scientists together from across divisions to further interdisciplinary discussions. Meetings will be organized by the OST Protected Species Branch, in consultation with the Office of Protected Resources and Science Center protected species science leadership. Funding provided by OST will support the cost of the meeting room and travel for at least one scientist from each of the six Science Centers to attend. Science Centers will fund participation by additional staff.
- NOAA Fisheries will strongly encourage all Science Centers to set aside travel support to allow Science Center staff, junior and non-supervisory scientists in particular, to attend scientific conferences, participate in activities collaborative workshops, training, and other similar activities so as to incentivize the development and maintenance of external partnerships and maintain/support career development. The goal

should be participation in at least one such activity per year. Existing training funds for each Center will be made available to allow for these types of activities.

Increase Operational Funding and Vessel Support

Reviewers at each program review noted the need to increase operational funds and vessel time to conduct protected species science for MMPA and ESA listed marine mammals, and ESA listed turtles and fish. Nearly all protected species science programs used base funding to pay for labor and rely heavily on external funding to support program operations ranging from vessel-based surveys of marine mammals, turtles, and fish to upstream monitoring of some anadromous fish species. For protected species, multiple sampling platforms are required including but not limited to ship days at sea, airtime for aerial surveys, small boats and hexacopters for protected species surveys, biopsy sampling for genetic analysis and other assays, and photo-identification studies. Deficiencies were noted in keys areas of:

- Stock structure;
- Understanding why stocks recover or fail to recover;
- Distributional changes; and
- Baseline data on stock abundance.

Recommendation: Reviewers at all program reviews noted a mismatch between the resources of the Science Centers and the science demands the Science Centers were facing. Reviewers highlighted stocks that were overdue for assessments and stocks that had yet to be assessed. Assessments, however, were only the baseline science needs for these species. Reviewers saw additional science needs related to a rapidly changing ecosystem. This included the need for a new look at recovery criteria in light of climate change, for an expanded geographic approach given likely shifts in species distribution, and the need to rethink population assessment advice in terms of alternatives to a population's status relative to a static point. Finally, reviewers recognized that the science needs of the future would depend on a more in depth understanding of the roles species in ecosystems than currently exists. Developing this understanding would require devoting resources to those questions while continuing to address ongoing monitoring and maintenance of critical specialized capabilities.

Response: We agree with the panelists' recommendations. Staff noted that simply increasing days at sea or airtime is not always sufficient if there are no operational funds, beyond salary, to support the research program.

Action Items:

- The schedule for review of marine mammal stock assessment reports is largely dictated by the MMPA. However, the schedule of surveys supporting these assessments often lag behind the assessment schedule and, as a result, data may not be up to date. NOAA Fisheries will develop and implement a survey prioritization process for protected marine mammal stocks analogous to that currently being developed for fish stocks; however, the limiting factor is funding for the surveys.
- Staff of Science Centers, Regional Offices, OST, and OPR will continue to work with the annual initiative process to identify NOAA funding for protected species surveys.
- The NOAA Fisheries Chief Scientist will work with Science Centers, BOEM, Navy, and USFWS staff to strengthen existing partnerships to leverage funding, infrastructure, and expertise to further support protected species surveys.
- In FY 2016, Congress approved a restructuring of the funding lines for NOAA Fisheries. This has the potential to provide greater flexibility in how appropriated funds are distributed to research programs within the appropriate funding line and should increase the ability to respond to emerging issues and needs. Where possible, Center leadership should explore taking advantage of funding flexibility to shift discretionary funding to support research on the highest priority species/research areas.
- Principal Investigators for all research cruises (i.e., fish, protected species, and ecosystem foci cruises) at each Science Center will work with the Center Vessel Coordinator and Science Center leadership to identify and take advantage of opportunities to 'piggy-back' protected species science work on other NOAA Fisheries research cruises.
- Fisheries Leadership, Science Centers, regional Offices and OST will investigate the possibility of maintaining critical, specialized science capabilities currently housed at a single Science Center (e.g., contaminant science, tissue sample archives, genetic programs, sea turtle science) as part of a national science program or center of excellence.

Workforce Capacity and Development

Nearly all the Science Centers have insufficient workforce capacity to meet the demands of the protected species science programs. Currently, a number of important programs are being run with a single, or no, permanent federal NOAA Fisheries employee staff time. This results in a precarious, single point failure situation in which the loss of a single person or a single relationship would cause the end of key projects. Resource limitation is the primary cause of this, but other contributing factors may include:

- Protected species science programs with relatively few federal staff and heavily reliance on contractors;
- Lack of succession planning; and
- Lack of junior staff career development and mentoring opportunities.

Recommendation: Reviewers had several recommendations for increasing the capacity of the NOAA Fisheries protected species workforce including general comments concerning enterprise-wide hiring of more federal staff or converting long-term contractors to federal positions, and suggestions to deal with specific problems identified in the reviews.

- Reviewers recommended NOAA Fisheries fund permanent full time federal positions in all Science Centers to fill staffing gaps as identified in individual Center reviews.
- Reviewers recommended that additional effort be put into succession planning for key positions and projects. Many senior level scientists are expected to retire in the near future and careful succession planning is needed for the Science Centers to maintain their expertise and the stability of the programs.
- Reviewers recognized that junior and other non-supervisory scientists were seeing insufficient opportunities for career development and mentoring. In order to fill the gaps as senior level scientists retire and to be successful in recruiting high-quality employees, reviewers recommended that Science Centers support opportunities for mentoring, travel, participation in innovative research, and other career development activities.

Response: This issue was identified at all Science Centers. We agree with many of the panelists' recommendations and propose several steps to alleviate this problem.

Action items:

- Science Centers will explore, to the extent possible, taking advantage of new funding flexibility to fund new federal positions to meet key needs or shift existing positions between programs to make better use of the existing workforce.
- Each Science Center and OST will develop or revise succession plans for key program positions, areas of expertise, and collaborative relationships as part of the Center's strategic planning process. Succession plans should explicitly include overlap between outgoing and incoming staff to allow for exchange of critical expertise and corporate memory (phased retirement).
- The NOAA Fisheries Science Board will explore the establishment of protected species science mentoring and career development programs. This could include a training program analogous to that being developed for fish stock assessment science, cross-Science Center detail opportunities, and providing junior and non-supervisory staff with the time to participate in innovative research projects.

The FY 2016 Reviews

The fourth year of NOAA Fisheries' program reviews is underway, with the focus shifting to ecosystem science, including climate and habitat considerations. We will continue to reflect how well we are completing the action items developed in response to the previous stock assessment and protected species program reviews. We will also, work to develop outreach products that illustrate the benefits of conducting these program reviews.

Overarching Terms of Reference for the FY 2016 reviews, the review dates and locations are posted at <http://www.st.nmfs.noaa.gov/science-program-review/index>. Results of all reviews will be posted on this site as they become available.

Table 1. National action items arising from the 2015 protected species science NOAA Fisheries program reviews

Action Item	Timeline
Clear Prioritization of Science and Management Needs	
The NMFS Protected Resources Board has implemented an annual exercise, now overseen by OST; whereby each Science Center will work with their corresponding Regional Office to further revisit and revise their joint strategic planning efforts. Results of this annual effort will be more fully implemented into the revision of all Science Centers and Regional Offices' Strategic Plans contemplated for FY2018	2017 then ongoing
OST staff will continue to work with Center, Regional Office and OPR staff to develop new ways of providing management advice (e.g., a national Ocean Noise Strategy and policy, the protected species climate vulnerability tool, the Regional Climate Science Action Plans).	2017 then ongoing
NOAA Fisheries Leadership, Regional Center Directors and Regional Administrators, OST, and OPR will work together to review the division of the responsibilities at Fisheries Leadership and in each region to clearly delineate the roles and responsibilities of the Science Centers, OST and the Regional Offices and OPR.	2017 then ongoing
Headquarters will continue to work with regional leadership to review and address the allocation of protected resources funding between science and management needs.	2017
Greater Coordination and Collaboration on Technology, Surveys, and Methods	
Beginning in FY2017, NOAA Fisheries will support a biennial Protected Species Assessment Workshop (analogous to the National Stock Assessment Workshop) to bring scientists from each region together to exchange data, methods, and technologies, establish best practices, and ensure consistency.	2017
NOAA Fisheries will strongly encourage all Science Centers to set aside travel support to allow Science Center staff, junior and non-supervisory scientists in particular, to attend scientific conferences, participate in activities collaborative workshops, training, and other similar activities so as to incentivize the development and maintenance of external partnerships and maintain/support career development.	2017
Increase Operational Funding and Vessel Support	
Fisheries will develop and implement a survey prioritization process for protected species stocks analogous to that currently being developed for fish stocks; however, the limiting factor is funding for the surveys.	2016 then ongoing
Staff of Science Centers, OST, and OPR will continue to work with the annual initiative process to identify NOAA funding for protected species surveys.	2016 then ongoing
The NOAA Fisheries Chief Scientist will work with Science Centers, BOEM, Navy and USFWS staff to strengthen existing partnerships to leverage funding, infrastructure, and expertise to further support protected species surveys.	2016 then ongoing
Center leadership will explore taking advantage of funding flexibility to shift discretionary funding to support research on the highest priority species/research areas.	2016 then ongoing

Principal Investigators for all research cruises (i.e. fish, protected species, and ecosystem foci cruises) at each Science Center will work with the Science Center Vessel Coordinator and Science Center leadership to identify and take advantage of opportunities to 'piggy-back' protected species science work on other NOAA Fisheries research cruises.	2017 then ongoing
Fisheries Leadership, Science Centers, regional Offices and OST will investigate the possibility of maintaining critical, specialized science capabilities currently housed at a single Science Center (e.g., contaminant science, tissue sample archives, genetic programs, sea turtle science) as part of a national science program or center of excellence	2017-18
Workforce Capacity and Development	
Science Centers will explore, to the extent possible, taking advantage of new funding flexibility to fund new federal positions to meet key needs or shift existing positions between programs to make better use of the existing workforce.	2017
Each Science Center and OST will develop succession or revise plans for key program positions, areas of expertise, and collaborative relationships as part of the Center's strategic planning process.	2017
The NOAA Fisheries Science Board will explore the establishment of protected species science mentoring and career development programs.	2017