



NOAA FISHERIES

**National Marine Fisheries Service
National Recovery Program Review**

**Final Synthesis Report
Prepared May 2016
By the Consensus Building Institute**



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Executive Summary

Introduction

On April 19-22, 2016, the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries) convened an independent review panel at its headquarters in Silver Spring, Maryland, to review the agency’s implementation of its National Recovery Program under the U.S. Endangered Species Act (ESA).

The objective of the program review was to evaluate the current NOAA Fisheries Recovery Program to determine if the current recovery planning process results in recovery plans that are effective roadmaps for recovering the species as evidenced by whether the plans are being implemented by NOAA Fisheries and stakeholders and resulting in progress towards meeting the criteria so that the species may be delisted.

The review evaluated the efficacy of the recovery planning process, including the quality of the recovery plans, the implementation of recovery actions, and the monitoring of recovery progress. Panelist recommendations are intended to inform agency efforts to improve recovery plans and the recovery planning and implementation process to increase the likelihood of recovering species.

Review Process

NOAA Fisheries’ Office of Protected Resources (OPR) convened a six-member review panel to evaluate the current NOAA Fisheries Recovery Program. The review panelists were:

NOAA Fisheries Recovery Program Review Panel	
Dr. Lisa Ballance <i>NMFS Southwest Fisheries Science Center</i>	Dr. Brad Gruver <i>Florida Fish and Wildlife Conservation Commission</i>
Dr. Kristin Carden <i>Society for Conservation Biology</i>	Dr. Beth Polidoro <i>Arizona State University</i>
Dr. Deborah Crouse <i>U.S. Fish and Wildlife Service</i>	Jennifer Steger <i>NOAA Restoration Center Northwest & Alaska Region</i>

The core of the review process was a four-day facilitated panel meeting organized around the following four overarching questions:

1. What species should have a recovery plan?
2. How effective is NOAA Fisheries at recovery planning?
3. How effective are the final recovery plans?
4. How effective is NOAA Fisheries at monitoring and implementing recovery?

NOAA Fisheries program and scientific staff presented substantive materials and 11 separate Recovery Program case studies. The first three days were open to the public and included multiple opportunities for public comment; a panel-only session was held on the fourth day. NOAA Fisheries provided extensive background materials to support panel deliberations.

Panel Findings and Recommendations

The Review Process was crafted to elicit individual advice from each panelist. In compliance with the Federal Advisory Committee Act, panelists submitted *individual reports*, not a combined report representing a “consensus perspective” of the panel, with each panelist making findings and recommendations on the core program review objectives:

- Does the current NOAA Fisheries Recovery Program result in progress towards recovery?
- What improvements to the Recovery Program would increase the chance of recovering species?

Below is a synthesis of the key overarching themes based on CBI’s review of the full panel reports. Panelists and NOAA Fisheries personnel were invited to review and provide comments on the sections drafted by CBI to ensure accuracy. The individual panelist reports, included in Appendix A, have not been revised by either CBI or NOAA Fisheries.

- Recovery Program staff and leadership are uniformly seen as key program assets. Panelists recommended the agency consider providing additional training and resources to ensure staff have the support needed to tackle program implementation challenges.
- In general, the program is seen as effective in focusing resources and recovery planning on those species at greatest risk of extinction. A notable gap cited by many panelists is the lack of clear criteria to guide whether or when NOAA Fisheries should prioritize species partially or completely outside U.S. waters. Several panelists noted the lack of a public comment or outside review process on this element of the program.
- Overall program effectiveness is difficult to assess conclusively given the lack of species’ status and recovery plan metadata, the voluntary nature of recovery programs, available resources and the many persistent and highly varied threats. Nevertheless, panelists perceive the program to be generally effective. Several panelists cited the significant accomplishment associated with simply stabilizing or reversing declines in many species. Several panelists recommended the use of interim milestones to track and propel further progress.
- Partnerships are essential to effective species recovery, and every panel report underscored the imperative for NOAA Fisheries to redouble its efforts to strengthen its work with partners if recovery actions are to be successfully understood, implemented and monitored. Even when cross-jurisdictional management philosophies may make partnering difficult, the program needs to “continue seeking some common ground.”
- Current lag time from species listing to recovery plan adoption is highly problematic. Every panelist voiced concerns with the time required to develop recovery plans, with many suggesting the agency rely on new models and formats and more streamlined

plans and planning processes to greatly reduce the time needed to prepare plans. Several reports also commented on the need to adopt a more efficient process to handle plan updates and revisions. Panelists provided numerous specific suggestions.

- Panelists wrestled with the issue of recovery team structure, recognizing the critical role an effective team can play in writing, implementing, and monitoring recovery plans. Most broadly, several panelists noted the imperative for teams to enhance focus on management actions, as some teams appeared overly focused on research. Further, teams should include (either as members or advisors) those stakeholders and managers necessary to implement recovery actions. Several panelists suggested that the agency take a closer look at team composition across the many recovery planning efforts to better understand cross-cutting success factors. Others recommended clearer direction on team goals, roles, and ground rules.
- Current recovery planning efforts fail to take full advantage of the potential synergy between recovery plans and other NOAA Fisheries programs, especially those associated with the Endangered Species Act and, in particular, Section 7 Biological Opinions and Section 10 Habitat Conservation Plans.
- Other core findings and recommendations focused on: challenges tied to recovering trans-boundary species; tighter linkage between threats, recovery criteria, and actions; strengthening monitoring efforts; periodic updating of the Recovery Program guidance documents; greater use of peer review; increased use of adaptive management; and more consistent consideration of climate change impacts.

Many additional findings and recommendations are included in each individual report, and readers are encouraged to review those reports to appreciate and understand the breadth of each panelist's comments and recommendations.

NOAA Fisheries Review and Next Steps

Following submission of this summary report to OPR, the Director of the Office of Protected Resources is to prepare a brief response, including any intended agency actions, to the summary report within ten weeks of receipt of the review report package. The Director of the Office of Protected Resources will also forward the package to the NOAA Fisheries Assistant Administrator for clearance.

At end of 90 days of the close of the review, all documents are to be posted on the Office of Protected Resources website. Authorship of the individual panelist reports remains anonymous and OPR is not accepting public comment on these panelist reports. The public will have opportunity to comment on any policy changes that NOAA Fisheries may undertake as a result of the review.

Materials from the program review process are available on the [program review website](#).

Introduction

On April 19-22, 2016, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) convened an independent panel at its headquarters in Silver Spring, Maryland, to review the agency's implementation of its National Recovery Program under the U.S. Endangered Species Act (ESA). This report provides a summary of the process, as well as panelists' findings and recommendations.

Review Process Overview

Context and Mandate

NOAA Fisheries works to conserve, protect, and recover species under the ESA and the U.S. Marine Mammal Protection Act. The ESA requires NOAA Fisheries to use all methods and procedures to bring listed species to the point where the protections of the ESA are no longer necessary. Section 4(f) of the ESA requires the Secretary to develop and implement recovery plans for the conservation and survival of endangered and threatened species.

Following similar review processes undertaken by NOAA's Fisheries Science Centers, NOAA Fisheries initiated the first review of its programs supporting protected species conservation and management. The overarching goals of undertaking this review of the NOAA Fisheries National Recovery Program were to:

- Ensure that program priorities and implementation are aligned with resources and mission mandates
- Enhance and align strategic management of NOAA Fisheries regulatory programs
- Provide transparency in the operation of NOAA Fisheries programs

The objective of the program review was to evaluate the current NOAA Fisheries Recovery Program to determine if the current recovery planning process results in recovery plans that are effective roadmaps for recovering the species as evidenced by whether the plans are being implemented by NOAA Fisheries and stakeholders and resulting in progress towards meeting the criteria so that the species may be delisted.¹ The review evaluated, within the context of current budget constraints, the efficacy of the recovery planning process, including the quality of the recovery plans, the implementation of recovery actions, and the monitoring of recovery progress. The review provides recommendations to improve recovery plans and the recovery planning and implementation process to increase the likelihood of recovering species.

¹ For the purposes of this program review, NOAA Fisheries and the panelists agreed to define "effective" as follows: "The terms of reference for the Recovery Program review specify that the objective is to evaluate the current NOAA Fisheries Recovery Program to determine if the current recovery planning process results in recovery plans that are effective roadmaps for recovering the species as evidenced by whether the plans are being

The Review Panel

NOAA Fisheries' Office of Protected Resources (OPR) convened a six-member review panel to evaluate the current NOAA Fisheries Recovery Program. These six panelists used information provided to them by OPR, their own professional expertise, and their discussions to provide advice on how to improve the NOAA Fisheries Recovery Program.

OPR sought to create a program review panel that brought together professionals familiar with the Endangered Species Act and species recovery. In addition, OPR sought to include a diversity of perspectives on the panel, including panelists representing NOAA's Science Centers, the U.S. Fish and Wildlife Service (NOAA's sister agency in implementing the Endangered Species Act), conservation and scientific organizations, and state agency partners. The review panelists were:

- Dr. Lisa Ballance, NMFS Southwest Fisheries Science Center
- Jennifer Steger, NOAA Restoration Center Northwest & Alaska Region
- Dr. Deborah Crouse, U.S. Fish and Wildlife Service Ecological Services Program, Division of Restoration & Recovery
- Dr. Kristin Carden, Society for Conservation Biology
- Dr. Beth Polidoro, School of Mathematical and Natural Sciences, Arizona State University
- Dr. Brad Gruver, Division of Habitat & Species Conservation, Florida Fish and Wildlife Conservation Commission

Five of the six panelists participated in the review process in-person. A sixth panelist, Dr. Carden, participated via teleconference. Biographies for all panelists are on the [program review website](#).

The Review Process

The program review process was shaped to incorporate several core elements:

- **Review of relevant background materials.** The review process was designed by NOAA Fisheries to provide extensive background materials to panelists. In their review of the NOAA Fisheries Recovery Program, panelists considered relevant statutes, policies, and guidance; the Marine Fisheries Advisory Committee Report; and their own professional experience. The materials provided by OPR to the review panel, as well as the set of supplemental materials significantly considered by the panelists in their review process, are available on the [program review website](#).
- **Multi-day, in-person review process.** A key aspect of the review process was a four-day meeting held at the National Oceanic and Atmospheric Administration Science Center in Silver Spring, Maryland. (The meeting agenda is available on the [program review website](#).) The meeting was organized around the following four overarching questions:
 1. What species should have a recovery plan?
 2. How effective is NOAA Fisheries at recovery planning?

3. How effective are the final recovery plans?
4. How effective is NOAA Fisheries at monitoring and implementing recovery?

NOAA Fisheries program and scientific staff presented substantive material and 11 separate case studies that provided information designed to help panelists consider each of the four questions. The deliberations were facilitated by the Consensus Building Institute, a non-profit that specializes in leading dialogues on complex environmental and other public policy issues. The first three days were open to the public; a panel-only session was held on the fourth day. Additional detail on the cases presented and panelist discussions is provided in the “Review Panel Workshop” section of this report.

- **Stakeholder involvement and input.** The meeting provided interested stakeholders with the opportunity to observe presentations and the majority of panel discussions. In addition, the meeting provided multiple opportunities for public comment by stakeholders attending the meeting in-person and those who participated in the proceedings via teleconference and webinar. The public was also invited to submit written comments, if interested. Approximately 95 individuals attended the meeting or participated via teleconference and webinar.

Overall, the process was designed to strike a balance between presentations and in-depth discussion, public involvement and panel-only deliberations. Panelist input into the review process design was solicited through two pre-review process teleconferences and informal input. The Terms of Reference for the program review is available on the [program review website](#).

Panel Report Drafting Process

The Review Process was crafted to elicit individual advice from each panelist. Specifically, each panelist was asked – based on the materials provided, cases presented, panel deliberations and public comments – to prepare a succinct report detailing observations of, and recommendations for, the NOAA Fisheries Recovery Program. Each panelist made findings and recommendations on the core program review objectives:

- Does the current NOAA Fisheries Recovery Program result in progress towards recovery?
- What improvements to the Recovery Program would increase the chance of recovering species?

In compliance with the Federal Advisory Committee Act (FACA, 1972), panelists submitted *individual reports*, not a combined report representing a “consensus perspective” of the panel. NOAA Fisheries asked that the authorship of each individual report not be provided to encourage greater candor among the panelists.

The facilitation team was responsible for drafting this final review report, including the cross-panelist synthesis included in the “Panelist Report Synthesis” section of this report. Panelists

and NOAA Fisheries personnel were invited to review and provide comments on the sections drafted by CBI to ensure accuracy. The individual panelist reports, included in Appendix A, have not been revised by either CBI or NOAA Fisheries.

NOAA Fisheries Review and Next Steps

Following submission of this summary report to OPR, the Director of the Office of Protected Resources is to prepare a brief response, including any intended agency actions, to the summary report within ten weeks of receipt of the review report package. The Director of the Office of Protected Resources will also forward the package to the NOAA Fisheries Assistant Administrator for clearance.

At the end of 90 days of the close of the review, all documents are to be posted on the Office of Protected Resources website. Authorship of the individual panelist reports remains anonymous and OPR is not accepting public comment on these panelist reports. The public will have opportunity to comment on any policy changes that NOAA Fisheries may undertake as a result of the review. Members of the public interested in being kept apprised of any actions taken or proposed as a part of this review process are asked to contact Therese Conant with NOAA's Fisheries Endangered Species Conservation Division (see contact information on [program review website](#)).

Review Panel Workshop

The bulk of the workshop centered on the four primary questions shaping the review process. Each of the first three public days of the meeting consisted of presentations by NOAA Fisheries staff, question-and-answer sessions directed to presenters by panelists, a public comment session, and an opportunity for panelists to provide preliminary reflections. In addition, two of these three days also included closed, panelist-only working sessions at the end of the day. The facilitator supported the panelists and ensured salient issues were raised, questions were discussed fully, and that the review proceeded in a timely fashion. The fourth day of the meeting consisted of panel-only deliberations, including a one-hour session with OPR Recovery Program leadership to answer panelists' outstanding questions regarding the review process and confirm the nature of comments and feedback useful to include in panelists' reports.

Workshop Background Presentations

Below is a summary of presentations provided as background for panel deliberations.

- **Welcome, Agenda Overview, and Meeting Protocols.** Bennett Brooks with CBI welcomed participants and provided a brief overview of the agenda, meeting logistics, and discussion protocols. He also highlighted opportunities and guidelines for public comment. This was followed by self-introductions by panelists, OPR staff leading the Recovery Process (Donna Wieting, Director of the Office of Protected Resources; Angela Somma, Chief of the Endangered Species Branch; and Therese Conant, NOAA Fisheries

Endangered Species Conservation Division), and audience members attending the review in-person.

- **Recovery Program and Review Process.** Ms. Conant with NOAA Fisheries Endangered Species Conservation Division provided an overview of the Recovery Program and review process. Her presentation provided background on the following elements: NOAA Fisheries jurisdiction under the ESA; a review of Recovery Program goals; an overview of total NOAA Fisheries recovery plans and plan status; a synopsis of federal guidance that shapes the agency’s approach to recovery planning, including plan and action prioritization; and an overview of the Recovery Program review objectives, structure, and intended outcomes.
- **ESA Recovery Planning and Implementation Legal Framework.** Ruth Ann Lowery, NOAA Office of General Counsel, and Holly Wheeler, Department of the Interior Office of the Solicitor, provided an overview of the legal framework that shapes ESA recovery planning and implementation. Key presentation points focused on the following: reviewing the recovery process’ dual biological and legal foundation; reviewing the regulatory underpinnings of the Recovery Program and key definitions associated with endangered and threatened species; providing an overview of the relevant ESA sections that guide recovery planning; explaining the relationship to other aspects of the ESA and other laws; and reviewing key judicial decisions related to recovery plans. Panelists posed several questions to better understand the linkage between the recovery planning process and NEPA (National Environmental Policy Act) review.
- **Welcome and Context from NOAA Fisheries Leadership.** Assistant Administrator for Fisheries Eileen Sobeck, Deputy Assistant Administrator for Regulatory Programs Samuel D. Rauch, III, and Office of Protected Resources Director Donna Wieting each offered their perspectives on the review process, thanking panelists for their involvement and underscoring the importance of their recommendations in informing program direction. Ms. Sobeck highlighted the agency’s impetus for undertaking program reviews, emphasizing the need to open its work to critiques from outside experts and the public to identify changes that will strengthen program effectiveness. Mr. Rauch underscored leadership’s interest in constructive advice in areas likely to yield the greatest benefit to the agency’s efforts to stabilize and, over time, recover listed species. Both Mr. Rauch and Ms. Wieting also emphasized the imperative to ground recovery planning in effective partnerships with federal partners, state, NGOs, and others. Leadership comments triggered the following discussion with panelists:
 - Better understanding the fit and limitations of the “best available science” standard in a collaborative (rather than regulatory) program.
 - Exploring the potential for stronger trans-boundary partnerships to strengthen recovery planning for listed species not entirely within U.S. waters.
 - Understanding leadership’s perspective on managing programs and prioritizing within a budget- and staffing-constrained environment, including the potential for a stronger partnership between Science Centers and the Recovery Program.

- Considering the role of state partners (partners or stakeholders) given the varied interest and perspectives on recovery planning across different states.
- **Question One: What species should have a recovery plan?** Heather Coll with the Endangered Species Conservation Division provided an overview of listed species currently without recovery plans. Her presentation focused on the following aspects:
 - Highlighting the rationale for the 52 species without recovery plans (49 foreign species in foreign waters and/or high seas; 1 species with a historical range within the U.S.; and 2 transnational species);
 - Noting that NMFS has applied the intent of the ESA by focusing on species where a recovery plan would promote conservation; and
 - Emphasizing the ongoing challenge to conserving foreign species.
- **Questions Two, Three, and Four: Recovery Program Case Studies.** A series of 11 cases, identified by OPR staff and confirmed prior to the workshop with the panelists, were presented to support the panel’s discussions on questions two, three, and four. The cases were chosen to cover a range of species types, planning processes and challenges. Two presenters were in-person; all others presented via webinar. Each presentation included time for panelists to pose questions and engage in discussion with case presenters. Below is a list of the cases presented. (All presentations can be found on the [program review website](#). More detailed aspects to consider related to each question can also be found in the Terms of Reference, also available on the [program review website](#).)

	Case	Presenter
Question 2: Effectiveness of Recovery Planning	Atlantic Salmon	Dan Kircheis, Protected Resources Division, Greater Atlantic Region
	Elkhorn & Staghorn Coral	Jennifer Moore & Alison Moulding, Endangered Species Branch, Southeast Regional Office
	Cook Inlet Beluga Whale	Mandy Migura, Protected Resources Division, Alaska Regional Office
Question 3: Effectiveness of Final Recovery Plans	Smalltooth Sawfish	Adam Brame, Endangered Species Branch, Southeast Regional Office
	Johnson’s Seagrass	Adam Brame, Endangered Species Branch, Southeast Regional Office
	Loggerhead Sea Turtle	Barbara Schroeder, Marine Mammal & Sea Turtle Division, Office of Protected Resources
	Puget Sound Chinook	Elizabeth Babcock, Branch Chief, West Coast Region
Question 4: Effectiveness at Monitoring and Implementing Recovery	North Atlantic Right Whale	Dave Gouveia, Marine Mammal & Sea Turtle Branch Chief, Greater Atlantic Region
	Leatherback Sea Turtle	Alexis Gutierrez, Marine Mammal & Sea Turtle Division, Office of Protected Resources
	Sacramento River Winter-Run Chinook	Brian Ellrott, Sacramento Office, West Coast Region
	Hawaiian Monk Seal	Angela Amlin, Pacific Islands Regional Office & Jason Baker, Pacific Islands Science Center

Discussion Themes Raised by Panelists

The bulk of the panelists’ comments and perspectives are summarized in the “Panelist Report Synthesis” section of this report; the panelist reports in full are available in Appendix A. Below, however, is a synthesis of the key topics and issues that were triggered during the panel workshop based on the case presentations, discussions with presenters, and panel discussions.

- Recognition of the Recovery Program’s significant strengths, from dedicated field staff to successful program elements that offer potential models for recovery planning. Ongoing training may be needed to ensure staff members possess the full complement of skills needed to successfully manage the complex recovery process.
- A focus on the extent to which the agency is able to address species located largely outside U.S. waters. Discussions centered on the potential for devising clear criteria for assessing which species should receive greater priority in the creation of recovery plans.
- Widespread concerns regarding the significant lag time between species listing and recovery plan adoption. Panelists sought to understand the extent to which changes in recovery team and plan structure and/or staffing might hasten the recovery planning process.
- The potential for developing a cadre of NOAA Fisheries recovery planning experts to support recovery teams nationwide and accelerate plan development. Other ideas for

accelerating recovery plan development included week-long sequestrations to support plan drafting and the wider use of neutral facilitation services for contentious planning processes.

- Concerns related to plans with joint jurisdiction between two or more agencies and the need for greater coordination at leadership levels across the jurisdictions to engage and resolve underlying conflicts that hamper recovery.
- Interest in an intentional effort by the agency to identify and replicate procedural lessons from the more successful approaches and plans.
- Variability in recovery team structure and size and any discernible linkage to the efficiency and effectiveness of recovery plan development. Panelists expressed interest in identifying best practices while still honoring the need for flexible, locally tailored processes that foster plan implementation.
- The imperative to more tightly link the recovery planning process to other regulatory and non-regulatory discretionary funding tools capable of improving species recovery and jump-starting recovery plan implementation (e.g., Section 7 of the ESA).²
- Questions regarding the level of specificity and usability of the plans (e.g., challenges of creating objective, measurable, and appropriate criteria; gauging ultimate effectiveness of the planning process towards species recovery).
- Various strategies and suggestions to make recovery plans more nimble, adaptable, and usable, such as streamlining the creation and updating of the species status sections of plans, expediting plan revisions and updates, and incorporating more concrete interim milestones to better measure and communicate progress.
- The need to characterize and present data in clear, compelling formats to drive usability and action; the threats assessment table from the Loggerhead Sea Turtle Recovery Plan was a frequently cited example for this.
- Differentiating between “bureaucratic recovery” (procedural progress but no significant change in species well-being) and “real-world recovery” (genuine improvement for listed species).
- The challenges of determining effectiveness of the recovery process for trans-boundary species.
- The need to leverage collaboration with diverse partners, including states, NGOs and private parties, to more cost-effectively and efficiently conduct monitoring and recovery actions.
- The imperative for effective partnerships.

A more detailed and cross-cutting synthesis based on panelists’ reports can be found in the “Panelist Report Synthesis” section of this report. Panelists’ individual reports are also attached in Appendix A.

² *Editor’s note:* During the panelist report review process, several panel members noted that the recovery plan process should not be delayed due to the timelines of these other efforts, such as awaiting a Biological Opinion under Section 7.

Public Comments

Stakeholders were given several opportunities throughout the review process to provide public comments. Below is a summary of key themes raised during public comment sessions and in comments submitted in writing to the agency.

Related to the recovery planning process

- It would be useful to clarify the meaning of “recovery,” both for the Endangered Species Act generally and also in terms of population numbers of specific species. Clarification could be through the use of more objective and specific thresholds, even if they are only semi-quantitative. In particular, external stakeholders may be looking for a more robust interpretation of this term, to advance real-world species recovery, than is customarily used by NOAA Fisheries (which may be more focused on “bureaucratic recovery”).
- It would be helpful to have interim milestones (short of delisting species) to aid in both recovery implementation and in communications efforts, including with lawmakers.
- When it comes to revising recovery criteria, it is acceptable to revise criteria because scientific understanding has advanced about what species’ needs are, but it is not acceptable to revise criteria simply because they are difficult to achieve. Recovery goals should be set using consistent, science-based standards rather than feasibility.
- NOAA Fisheries should create recovery plans for all eligible species because they provide for greater predictability in planning and adaptability for future changes, both for the agency and for the regulated public.
- The threats assessment table that was presented for loggerhead sea turtles could be expanded to integrate across species and thereby better identify common threats and common recovery actions. This sort of table should be required for all recovery plans.
- NOAA Fisheries should transition to online recovery plans to allow for more efficient updating of plans, among other benefits.
- Particularly for data-limited species, recovery outlines may be a wiser use of resources than the creation of recovery plans.
- Integrating threats and recovery actions across species, and using geospatially explicit data, can help identify efficiencies and reduce redundancy in recovery implementation. In particular, establishing a system that automates data integration across all listed species, and perhaps that includes other protected resources, could provide multi-species overviews of threats and actions.
- NOAA Fisheries needs to make better use of available resources related to the bi-national Kemp’s ridley recovery plan to identify needed research and strategies to improve population models, estimates of vital statistics and other factors that inform future demographic and stock assessment models of Kemp’s ridley female population.

Related to partnering/outreach

- The case studies demonstrate that a lot of what makes “recovery” successful is successfully engaging with local human stakeholders. The recovery teams could be made stronger if they include social scientists and other “people people” who better understand human behavior and how to encourage local stakeholders to participate in

recovery actions. There would be particular value for NOAA Fisheries to have social scientists as in-house staff members.

- A focus on outreach has helped rebuild trust in Endangered Species Act management in the Western Pacific.
- Providing more open science and data would allow external stakeholders to better assist NOAA Fisheries in its conservation work.
- Recovery plan drafters should create GIS shapefiles of areas described in recovery criteria, such as recovery units, and post these shapefiles online for public access in the same way that critical habitat shapefiles are available for public download. This will enable conservationists and regulated entities to better determine which areas are essential for recovery.
- In recent years, NOAA Fisheries has increasingly centralized discussions, decision-making, and funding – to the exclusion of the non-governmental conservation community. The guiding principles of transparency, accountability, and stakeholder involvement should be placed at the forefront of the agency’s actions going forward. For example, non-government right whale researchers have had an increasingly difficult time securing research permits and funding to contribute to right whale research. An ombudsman at NOAA Fisheries to liaise with external stakeholders would be helpful, as would an inclusive, independent working group that has oversight and input on right whale science, planning, management, budget, and recovery.
- Management agreements with partners and creative ideas beyond the Endangered Species Act should be explored. The current system provides little incentive for stakeholders that are most impacted to provide sustained support.

Related to Recovery Program actions and monitoring

- In addition to considering the scientific basis for down-listing and delisting, NOAA Fisheries and recovery team members should consider legal and political implications of down-listing and delisting, including the prospect that species populations could encounter renewed pressure.
- The recovery planning process should continue to be tailored to the species and the local context, even if NOAA Fisheries begins to provide greater resources and guidance to the individual recovery teams.
- Pursuing holistic approaches to recovery (such as targeting nesting sites and raising community awareness for turtles) is more important than targeting “low-hanging fruit.”
- The bulk of NOAA Fisheries’ recovery actions have been focused on the U.S. fishing fleet, which can cause resentment among these stakeholders.
- Site-specific actions can be of critical importance, including for integrating with other parts of the ESA. NOAA Fisheries should critically consider the importance of including site-specific actions, including for small-range species.
- NOAA Fisheries, in collaboration with FWS (as with the Recovery Online Action Reporting database), should prioritize development and adoption of a comprehensive take-tracking system that explicitly links to recovery criteria and site-specific actions.

- The Recovery Program is not working. NOAA Fisheries management is ineffective and 99 percent of species are on the way to extinction.

Related to Recovery Program resource needs

- In some cases, observer coverage of fishing fleets is very low and would be very expensive to increase. Should this challenge be addressed in the recovery plans, by NOAA, or otherwise?
- NGOs and the conservation community could more effectively advocate for increased funding for NOAA if the agency were to provide greater guidance about how to do so.

Related to the Recovery Program review process

- NOAA Fisheries should be commended for initiating this review process.
- Seeking clarification on when NOAA Fisheries will be conducting similar review programs for the other components of the Endangered Species Act.
- NOAA should consider explicit integration between the outcomes of this program review and any future reviews on sections 7 and 10 of the ESA.
- NOAA representatives presented all of the case studies, which may lead to presentation of a biased perspective. It would be more helpful for the review process to hear from more outside, independent perspectives.

Wrap-up and Next Steps

CBI Facilitator Tushar Kansal reviewed key themes based on the panel’s deliberations during the public sessions. He noted a panel-only session is to be held Friday, April 22, in order to give panelists a chance to reflect on the presentations and begin drafting individual reports.

Next steps in the review process outlined by Ms. Conant focused on the following:

- Panelists provide their final individual reports, without attribution, to CBI by Friday, April 29.
- CBI produces a draft Synthesis Recovery Program Review Report by Friday, May 13, for review and comment by Recovery Program staff and by panelists. CBI finalizes the report based on OPR and panelist comments (due Friday, May 20) and submits a final report to NOAA Fisheries by Monday, May 30.
- NOAA Fisheries drafts its response to panelist findings and recommendations, including any next steps. Its response is expected to be available by August 8, 2016.
- All documents to be available on the [program review website](#) within 90 days from the close of the review process.

For questions or comments regarding this report, please contact Therese Conant (301-427-8456 or therese.conant@noaa.gov).

PANELIST REPORT SYNTHESIS

The Program Review Terms of Reference called for panelists to prepare individual reports on key findings and recommendations based on the program review. These individual panelist reports are presented in Appendix A; they have not been edited or revised by either CBI or NOAA Fisheries.

The summary below, prepared by CBI, looks across all six panelist reports to provide a synthesis of key themes and takeaways. It is organized in three sections:

- 1) **Overarching themes.** This is a synthesis of the key overarching themes based on CBI's review of the full panel reports. It strives to look across all aspects of each individual panelist's report to identify and distill the most salient and common themes.
- 2) **Key question synthesis.** This section is a synthesis of key findings and recommendations by question. In identifying these themes, CBI focused on highlighting those topics that were common to multiple panelists, as well as calling out any divergent perspectives.
- 3) **Additional comments from panelist reports.** A third section strives to highlight individual points identified by each panelist in additional report comments. These, for the most part, represent themes panelists chose to capture in introductory or concluding statements or characterized as big-picture takeaways.

Necessarily, there is some overlap across all sections, but we believe that helps underscore areas of greatest focus for panelists. Many additional findings and recommendations are included in each individual report, and readers are encouraged to review those reports to appreciate and understand the breadth of each panelist's comments and recommendations. Additionally, this synthesis reflects the observations and recommendations made in the panelist reports. Individual panelist's statements have not been screened or revised for consistency with existing statutes, legal guidance, or the current status or practice of the Recovery Program.

All panelists were provided an opportunity to review and comment on an early draft of CBI's synthesis. This report reflects their feedback and recommended revisions.

Overarching Themes

A review of the panelist reports suggests a handful of key themes and recommendations for consideration by NOAA Fisheries. Below is a summary of the key themes that echo across many or all of the individual panelist reports or are themes cited by one or more panelists as being of paramount importance.

- Recovery Program staff and leadership are uniformly seen as key program assets, given their skills and expertise, commitment to the program, and ability to manage a non-regulatory program that demands broad collaboration to be effective. Several panelists noted, in particular, Recovery Program staff's ability to juggle enormous workloads with increasingly limited resources. Panel reports included recommendations that the agency

consider additional training and sharing of resources to ensure program staff have the support needed to successfully manage plan development and implementation.

- In general, the program is seen as effective in focusing resources and recovery planning on those species at greatest risk of extinction. The existing guidance document is particularly helpful in driving prioritization. A notable gap cited by many panelists is the lack of clear criteria to guide whether or when NOAA Fisheries should prioritize species partially or completely outside U.S. waters (including species whose ranges historically included U.S. waters). Several panelists recommended developing clear criteria to guide decisions on trans-boundary species. Several panelists noted the lack of a public comment or outside review process on which species are chosen for recovery plans.
- Overall program effectiveness is difficult to assess in a conclusive manner given the lack of metadata across species' status and recovery plans, the voluntary nature of recovery programs, available resources and the many persistent and highly varied threats. Nevertheless, panelists perceive the program to be generally effective, using phrases like "resulting in progress towards recovery," "decent job," and "very effective" to characterize program effectiveness or, as one panelist put it, "the process machinery is effective." Although only one species has been delisted, several panelists cited the significant accomplishment associated with simply stabilizing or reversing declines in many species. Others noted that no species with a recovery plan has become extinct. Several panelists recommended the use of interim milestones to track and propel progress.
- Partnerships are essential to effective species recovery, and every panel report underscored the imperative for NOAA Fisheries to redouble its efforts to strengthen its work with partners if recovery actions are to be successfully understood, implemented and monitored. Panelists called out a range of critical partners, from federal, state and tribal fish and wildlife agencies to academics, researchers, NGOs and other stakeholders. Even when cross-jurisdictional management philosophies may make partnering difficult, the program needs to "continue seeking some common ground" to propel progress.
- Current lag time from species listing to recovery plan adoption is problematic and needs to be addressed. Every panelist voiced concerns with the time required to develop recovery plans, with many suggesting the agency rely on new models and formats and more streamlined plans and planning processes to greatly reduce the time needed to prepare plans. Several reports also commented on the need to adopt a more efficient process to handle plan updates and revisions. Several panelists cited the potential to use and/or link to existing population data and other resources, including online sources, to streamline the time needed to prepare species status assessment section. Panelists also

highlighted the potential to use recovery outlines to more quickly begin taking management actions without waiting for the completion of recovery plans.³

- Panelists wrestled with the issue of recovery team composition, recognizing the critical role an effective team can play in writing, implementing and monitoring recovery plans. Panelists had varied views on an ideal size for recovery teams; several noted that team effectiveness is often driven by some combination of the level of conflict associated with each species' recovery plan, team composition, interpersonal team dynamics and the skill of Recovery Program staff. Most broadly, several panelists noted the imperative for teams to enhance focus on management actions, as some teams appeared overly focused on research. In addition, some reports noted, teams must include (either as members or advisors) the stakeholder and management expertise necessary to implement recovery actions. Several panelists suggested that the agency take a closer look at team composition across the many recovery-planning efforts to better understand cross-cutting success factors. Others recommended clearer direction on team goals, roles and ground rules.
- Current recovery planning efforts fail to take full advantage of the potential synergy between recovery plans and other NOAA Fisheries programs, especially those associated with the Endangered Species Act and, in particular, Section 7 Biological Opinions and Section 10 Habitat Conservation Plans.⁴ One panel report recommended the possibility of agency-wide training on application and/or integration of recovery plans into other NOAA programs and ESA sections. As one panelist wrote in concluding remarks: "...tighter integration and communication between the regulatory and recovery staffs would be beneficial."
- A handful of other themes are worth calling out given their prominence in several panelists' reports. They include:
 - Monitoring efforts should be enhanced, including an explicit analysis of the effect of management/mitigation actions on the focal species. The results of these monitoring efforts should be used to guide ongoing recovery planning and management decisions.
 - Recovery planning and implementation for trans-boundary species is particularly problematic given the lack of authority to address threats outside U.S. waters. While often challenging, more effective partnerships are needed to foster implementation of recovery actions outside U.S. waters.

³ During the report review process, several panelists noted that recovery outlines should not be used as a means of delaying or avoiding production of the actual recovery plans.

⁴ *Editor's note:* During the report review process, panelists further suggested that the recovery plan process should not be delayed due to the timelines of these other regulatory and non-regulatory tools, such as awaiting the creation of a Biological Opinion under Section 7.

- All plans need to include objective, measurable criteria that are clearly mapped to both threats and recovery actions. Though currently required, some panelists suggested this is not consistent across all plans. Including a threats assessment table would help to accomplish this.
- NOAA Fisheries may want to consider developing and deploying a cadre of ESA recovery plan specialists who can share best practices across teams. However, such specialists must not drive plan direction, as long-term recovery plan success is very much linked to species-specific expertise and stakeholder buy-in. Several panelists recommended the use of outside facilitators for particularly contentious plans.
- NOAA Fisheries would benefit from periodically reviewing and updating its well-used and thoughtful Recovery Program guidance to ensure it is current and promoting best practices across all recovery planning efforts.⁵
- Peer review is used inconsistently across plans. NOAA Fisheries should consider developing a clear policy outlining the use of external peer review relative to the recovery planning process.
- Seek opportunities to more fully incorporate adaptive management into the Recovery Program, including plan criteria and management actions.
- Consideration of climate change impacts on species recovery appears inconsistent and needs to be addressed in a structured manner as an explicit threat.

Finally, panelists broadly complimented the program review process itself, citing the mix of cases presented, background materials provided and opportunity for discussion with program managers. Recommendations for strengthening future review processes included: providing a meta-analysis of all recovery plans and species status related to plans; broadening the review panel composition to include a wider array of stakeholder perspectives; incorporating more in-person presentations by recovery plan coordinators; and having more contact with those recovery plan coordinators.

Key Question Synthesis

Below is a synthesis of key findings and recommendations by each of the four questions posed by NOAA Fisheries. As noted above, in identifying these themes, CBI focused on highlighting those topics that were common to multiple panelists, as well as calling out divergent

⁵ *Editor's note:* During the report review process, one panelist noted that NOAA Fisheries has been committed to updating the guidance, but – given that it is a joint guidance with FWS – progress has been dependent on the schedules of both agencies.

perspectives. Again, more specific and detailed findings and recommendations are included in each individual panelist report, available in Appendix A.

Question 1: What species should have recovery plans?

Key Findings

Panelists provided the following observations about NOAA Fisheries' decision-making process:

- A strength of NOAA Fisheries' process is the existence of a guidance document and system for determining which species should have recovery plans (*Panelist 2 and 3*).
- NOAA Fisheries' process for determining which species should have recovery plans does not provide any scope for public comment or external review (*Panelists 3 and 6*).

Panelists observed that NOAA Fisheries often does not create recovery plans for listed species located entirely outside of U.S. waters, including species whose ranges historically included, but no longer include, U.S. waters (*Panelists 1, 2, 5, 6*). NOAA Fisheries has created recovery plans for many transboundary species whose range includes U.S. waters (*Panelists 1, 2, 5, 6*). The criteria for determining which foreign and transboundary species should have recovery plans are unclear (*Panelists 2, 4, 6*).

Key Recommendations

Panelists provided a variety of recommendations for clarifying and strengthening the categorization and prioritization of NOAA Fisheries' decision-making process around which species should have recovery plans (*Panelists 1, 3, 4, 5, 6*). Some examples include:

- Create and strengthen the criteria and decision matrix to prioritize which species should have recovery plans and which type of plan would be appropriate (e.g., single versus multiple-species plans or ecosystem plans, multi-national species plans, etc.).
- Develop clear guidelines to determine when it is appropriate to conduct recovery planning for transboundary species. For example, set a range or population threshold within U.S. jurisdiction for exclusion.
- Provide opportunities for public comment and/or external review of agency decisions about which species should have recovery plans.

Panelists suggested that NOAA Fisheries explore partnering with and adapting existing conservation instruments for species currently without ESA recovery plans. For example, NOAA Fisheries could explore adaptation and/or adoption of existing conservation instruments (e.g., MMPA, state conservation plans, foreign recovery plans) if they can be amended to meet ESA legal requirements (*Panelists 1, 2, 3, 6*).

Question 2: How effective is NOAA Fisheries at recovery planning?

Key Findings

There was unanimity among the panelists that the recovery planning process takes too long. Panelists cited a number of undesirable consequences as a result of the long timelines for recovery plan creation, including outdated science, delayed implementation of recovery

actions, staff turnover, process fatigue, and subpar and outdated recovery planning documents (*All Panelists*).

A number of panelists cited the dedication of NOAA Fisheries staff members and applauded their efforts in creating recovery plans (*Panelists 1, 2, 3, 4*).

All of the panelists spoke to the importance of effectively managing stakeholder inclusion and participation on recovery teams. On the one hand, more robust stakeholder participation can result in more comprehensive recovery plans with improved capacity, funding, and collaboration for subsequent implementation of recovery actions. On the other hand, more robust stakeholder involvement risks slowing down the plan development process (*All Panelists*).

Many panelists noted that joint jurisdiction over recovery planning can be challenging for plan development and execution, given different philosophies and management strategies, resulting in added process complexity and potential delays (*Panelists 2, 3, 4, 6*).

A few panelists suggested that recovery outlines could be used to greater effect in terms of providing a framework for discussion with stakeholders about the development of recovery plans and providing templates for those recovery plans (*Panelists 3, 4, 6*).

Key Recommendations

A number of the panelists emphasized that recovery plans should be completed more quickly, with some of the panelists suggesting that NOAA Fisheries should strive to meet the 2.5-year timeline for creation of recovery plans that is outlined in the Interagency Cooperative Policy guidance (*Panelists 3, 4, 6*).

Panelists suggested that NOAA Fisheries consider the following types of factors when inviting stakeholders to participate in recovery planning, whether as part of a recovery team or in other capacities: potential to increase international or external collaboration, potential to ask for funding, potential to implement projects, individual and institutional commitment to ongoing participation, overall representation on teams of diverse institutional affiliations (e.g., states, tribes, foreign nations, NGOs, etc.), and overall representation on teams of diverse areas of skill and expertise (e.g., management, research, social science) (*Panelists 1, 3, 5, 6*).

Many of the panelists emphasized the importance of enhancing the capacity and facility of NOAA Fisheries staff and the recovery teams in skills such as project management, facilitation, group leadership, and diplomacy. This can be accomplished through diverse mechanisms, including training NOAA coordinators, the deployment of in-house “recovery plan production experts” to assist recovery teams, the hiring of neutral facilitators and conflict resolution specialists, and the inclusion of social scientists on recovery teams (*Panelists 1, 2, 3, 5*).

Various panelists suggested the use of diverse mechanisms and tools to assist recovery teams, such as: sequestration of the recovery planning team to foster timely plan drafting; templates;

issue-specific guidance; access to modelers and GIS technicians; neutral facilitation; and in-house “recovery plan production experts” (*Panelists 1, 2, 3, 5*). In addition, clearer articulation of goals, roles and responsibilities, scope, mandate, meeting dates, ground rules, etc. in the Terms of Reference or otherwise early in the process would be useful in most recovery planning processes, especially in those involving joint jurisdiction (*Panelists 1, 2, 6*).

Many panelists recommended that NOAA Fisheries leverage diverse resources, such as recovery outlines, existing conservation plans (e.g. created for the Marine Mammal Protection Act or by foreign agencies), and scientific analysis conducted for the listing document to streamline the recovery planning process and avoid unnecessary redundancy of efforts (*Panelists 1, 2, 3, 5, 6*). The U.S. Fish and Wildlife Service’s Species Status Assessment (SSA) framework can provide a structured and transparent process to assess species’ status and can also provide the basis for more flexible plans that allow for the status component of recovery plans to be updated separately from the threats/criteria/action components of recovery plans (*Panelists 4, 5*).

Panelists articulated somewhat differing perspectives as to whether there is a preferable size for recovery teams. Some panelists placed greater emphasis on size, suggesting that teams that are too large are more likely to become unwieldy (*Panelists 2, 5, 6*). Others highlighted various other factors, such as group cohesion, strong leadership, shared vision, structure, and clarity of direction and mandate as perhaps more important for ultimate effectiveness than size (*Panelist 1*).

Question 3: How effective are the final recovery plans?

Key Findings

Two panelists remarked that the recovery plans vary greatly in information and priority strategies for implementation (*Panelists 4, 5*).

Several panelists observed that a detailed, well-defined threats assessment allows for cross-walking of recovery objectives, criteria, and actions against threats to make sure they are linked. Panelists specifically cited the threats assessment table presented as part of the Loggerhead Sea Turtles case (*Panelists 1, 2, 4, 5*).

Some panelists noted that developing objective, measurable, and appropriate recovery criteria can be a challenge, particularly for data-poor species. For example, recovery objectives and criteria do not always address the impact of threats or improving species demographics (*Panelists 1, 2, 6*).

Panelists provided the following observations about the management actions included in recovery plans:

- Some plans do not provide site-specific management actions (*Panelists 1, 3, 6*).
- In some recovery plans, recovery actions are not linked to recovery criteria (*Panelists 1, 3, 6*).

- Some plans do not identify which parties are responsible for implementing recovery actions (*Panelists 1, 4*).
- Prioritization of recovery actions is a challenge, particularly in plans with large numbers of management actions (*Panelists 2, 6*).

Several panelists remarked that some recovery plans are more focused on guiding future research than on implementing management actions towards recovery (*Panelists 1, 4, 6*).

A number of panelists noted that the utility and effectiveness of recovery plans ends up being reduced in cases when it takes extensive time to create and update them (*Panelists 1, 2, 3, 6*).

Panelists observed that, while recovery plans are generally available to the public, they are often challenging for stakeholders to use due to their length, complexity, and outdated data (*Panelists 1, 3, 4, 6*).

All panelists noted that there are significant challenges in gauging the effectiveness of the final recovery plans as a result of various factors, such as unforeseen or unintended impacts to the species that were not accounted for in the recovery objectives and criteria, time lags for monitoring and feedback on species response, and inconclusive monitoring data (*All Panelists*).

All panelists observed that stronger linkages and integration could be made between the recovery plans and other portions of the Endangered Species Act, particularly Section 7 consultations and Section 10 Habitat Conservation Plans. Some examples include:

- Identify “can’t lose” habitats to provide support for jeopardy or adverse modification determinations in Section 7 consultations (*Panelist 4 in “Question 3 Recommendations” section*).
- Design recovery plans to be more useful for Section 7 consultations and HCP development (*Panelist 2 in “Question 3” response*).
- Incorporate data and protections outlined in biological opinions into recovery plans to facilitate the recovery planning process and the use of best available science (*Panelist 6 in response to “Question 4”*).
- Consider agency-wide training on application and/or integration of recovery plans into other NOAA programs and ESA sections (*Panelist 1 in response to “Question 4”*).
- Use all of the ESA toolbox and leverage both human capital and discretionary funding for recovery actions (*Panelist 4, “General Observations”*).

Some panelists commented that limitations of funding, staffing, and resources can be a challenge for recovery plan effectiveness, particularly given large geographic and taxonomic scope, a broad range of threats and stakeholders, shared jurisdiction for many species with other federal and state agencies, and a skeletal knowledge base for some listed species. Additionally, the program’s burden is significantly increasing without additional resources (*Panelists 1, 2, 3, 4, 5*).

Key Recommendations

Many panelists recommended that the threats analysis in recovery plans be made much more systematic, transparent, and logical, with several panelists calling for a threats assessment table (as presented in the Loggerhead Sea Turtles case) to be required in all plans (*Panelists 1, 5, 6*). Panelists stated that more specific identification of threats would allow for better identification of research needs on the impact of threats and the locations for site-specific management actions, and allow for aligning the reduction of threats with recovery objectives, criteria, and actions (*Panelists 1, 2, 5, 6*).

Several panelists urged that the information in recovery plans be presented in user-friendly formats, such as web-based summaries of key recovery objectives, criteria, and actions (and linkages between these). Panelists also urged that plans be easily searchable and indexed online (*Panelists 1, 2, 3*).

Question 4: How effective is NOAA Fisheries at monitoring and implementing recovery?

Key Findings

A few panelists observed that recovery implementation teams have proven helpful in successfully implementing recovery plans (*Panelists 1, 2, 6*). More generally, panelists noted that partnerships with other stakeholders are often very helpful for effective monitoring and recovery implementation but that these partnerships can be difficult to sustain over time and that international partnerships can be particularly challenging (*Panelists 1, 3, 4, 6*).

A number of panelists remarked on the difficulty of assessing the effectiveness of recovery actions. Few of the case studies included an explicit analysis of the effect of management/mitigation actions on the focal species. More generally, many recovery actions are open-ended, and demographic and threat criteria for meeting recovery objectives will take a very long time to meet due to the inherent reproductive biology of the species and/or the persistence of significant threats (*Panelists 1, 3, 5, 6*).

Some of the panelists noted that the case studies generally demonstrated efforts to adapt recovery actions and criteria to new information that arose from monitoring programs (*Panelists 1, 4*).

Panelists observed a high degree of variability in integration of recovery planning with other portions of the Endangered Species Act (e.g. Sections 4, 7, and 10) and with other NOAA programs, with some case studies demonstrating effective integration and many others lacking this aspect (*Panelists 1, 2, 4, 5*).

Several panelists commented that, while NOAA Fisheries' staff is highly dedicated and a strong asset to the Recovery Program, funding and staffing limitations can hinder program effectiveness (*Panelists 2, 3, 6*).

Two panelists, while noting the public outreach efforts already underway, noted the further potential of using social media, to drive community understanding and engagement in species recovery (*Panelists 4, 6*).

There was some divergence among panelists with regards to the effectiveness of monitoring efforts. While some panelists observed that all of the presented case studies demonstrated innovative and effective monitoring programs (*Panelists 1, 4, 6*), other panelists suggested that monitoring efforts are of uneven effectiveness (*Panelist 2*). In particular, panelists noted that very few case studies included an explicit analysis of the effect of management/mitigation actions on the focal species (*Panelists 1, 3, 5, 6*).

Key Recommendations

Some of the panelists recommended that NOAA Fisheries strive to monitor the effectiveness of recovery actions as well as more rigorously document the progress of recovery plans (*Panelists 1, 2, 5*). Two panelists suggested that NOAA Fisheries use monitoring results to guide recovery planning and management decisions, including the use of adaptive management and five-year reviews and other plan revision opportunities (*Panelists 2, 6*). Panelists also suggested that interim benchmarks or milestones be created to enhance both monitoring and communications efforts (*Panelists 2, 4, 6*).

Panelists urged NOAA Fisheries to continue focusing on partnerships and involving stakeholders in recovery planning and implementation processes. Specific areas mentioned by panelists include recovery and implementation teams, consultation with stakeholders who are not included on recovery teams, and the use of social media and other tools to raise public awareness (*Panelists 1, 3, 6*).

All of the panelists recommended that recovery planning be better integrated with other species conservation tools, particularly Sections 7 and 10 of the Endangered Species Act (*All Panelists*).

Panelists suggested that NOAA Fisheries foster stronger linkages between staff within the agency. For example, some panelists recommended holding an annual or bi-annual meeting or workshop for all NOAA coordinators to meet and share progress, successes, failures, etc.; identifying specific people from other sections of NOAA and State Agencies that can work together to help support the workload and skill-set of NOAA recovery coordinators; and encouraging and reinforcing tight linkages between the management and science sides of NOAA Fisheries (*Panelists 1, 2, 5*).

Additional Comments from Panelist Reports

In addition to the findings and recommendations for each of the four questions posed by NOAA Fisheries, all six panelists also provided additional comments in their reports. Panelists took a variety of approaches, with some providing introductory comments, some providing concluding observations, and some including both of these. Additionally, some panelists focused on themes that they did not cover elsewhere in their reports while others highlighted big picture

take-away points. The following is a synthesis of key themes raised by the panelists in their reports outside of their responses to the four questions posed by NOAA Fisheries. Some of the comments reflect the review of multiple panelists; others, the perspectives or recommendations of just a single panelist. All are included here since they represent a compilation of what each panelist self-identified as noteworthy points. Not surprisingly, many of these comments reiterate themes already captured above.

Overall observations on the National Recovery Program:

- Overall, the National Recovery Program appears to be reasonably effective.
- The dedication and caliber of staff and leadership are key program assets. Providing them with more training and resources could significantly strengthen the program.
- The Recovery Program regularly faces significant challenges: a large geographic and taxonomic scope, and a broad range of threats and stakeholders; shared jurisdiction for many species with other federal and state agencies; and a skeletal knowledge base for some listed species. Additionally, the program's burden is significantly increasing without additional resources.

Comments related to making the Recovery Program more effective:

- Diverse tools and approaches, such as using preexisting status assessments, developing recovery outlines, keeping recovery plans online, and flexibly updating different components of the plan as needed, should be used to speed up the plan development and revision processes.
- Significant resources, time, and energy are devoted to recovery planning and a lesser amount to planning of recovery implementation strategies (e.g., financial or program funding targets to implement recovery actions).
- Linkages between the Recovery Program and other sections of the ESA (particularly Sections 7 and 10) could greatly enhance program effectiveness.
- The development and maintenance of strong, durable, and stable partnerships, followed closely by significant and continuing stakeholder involvement, are critical to the success of the Recovery Program.
- Species status assessments should be designed to provide information beyond that necessary to inform listing and reclassification decisions. In particular, status assessments should include a threats assessment examining stressors to facilitate more synergies and effectiveness between the recovery and consultation programs.
- Recovery plans should clearly communicate the connections between threats, recovery criteria, and actions. Including a threats assessment table would help to accomplish this.
- Recovery Program staff should conduct a thorough review and, if appropriate, revision of the Interim Recovery Planning Guidance with an eye to clarifying the goals/objectives of the Recovery Program and to increasing the rigor associated with categorization and prioritization.⁶

⁶ *Editor's note:* As explained in an earlier footnote, one panelist noted during the report review process that NOAA Fisheries' interest in updating the guidance is dependent on its coordination with FWS given it is joint guidance.

- Recovery Plans should incorporate a holistic approach to recovery actions to the greatest extent possible, without regard for national boundaries and jurisdictions, so as to incorporate all habitats, life stages, and threats. Recovery actions should be prioritized based on the magnitude of the threat and/or benefit of the action.
- In order to address the challenges presented by vague language in the ESA and Interim Recovery Planning Guidance, OPR should conduct a workshop to investigate the degree to which more precise, and when possible, quantitative interpretations of such language would benefit the Recovery Program.
- Every recovery plan should explicitly include climate change as a potential threat in the threats assessment piece, even when direct actions to mitigate those threats may not be apparent.
- NOAA Fisheries should not discount historical range when determining (1) whether a species should receive a recovery plan, and (2) where recovery efforts should focus.
- NOAA Fisheries should develop and implement a regulation requiring the use of the best available science for recovery planning.
- NOAA Fisheries should craft an agency policy that clearly outlines when independent, external peer review will be used in recovery planning.
- Objective, measurable recovery criteria and site-specific management actions must be included in every recovery plan.
- Recovery plans must place greater focus on management actions, as some plans were seen to be overly focused on research. To facilitate this, recovery teams should include both managers and scientists.
- Recovery plans should set out exactly what needs to be done to truly recover a species, regardless of politics and perceived “real-world feasibility.”

Comments related to understanding the effectiveness of recovery efforts:

- There is currently little analysis of the effectiveness of plans and implementation for actual species recovery. Creating interim milestones would help to accomplish this.
- One way to track species progress toward recovery criteria and de-listing factors might be to keep a database of recovery objectives, criteria, and actions, with the percent completed for each metric, in order to provide more detailed progress information.

Comments related to the review process:

- The review process was well designed, overall, with a strong format, high-quality presentations, and useful materials provided. More in-person presentations would have been helpful.
- Important topics that did not receive sufficient attention during the review process include climate change and adaptive management.

- Consider expanding the review panel to include representatives from international NGOs, intergovernmental agencies, other academic institutions, the corporate sector, etc.⁷
- Suggest providing the panel with a more detailed meta-analysis of the recovery plans and species status information before the review process in order to provide a broader perspective on the Recovery Program. Program-wide statistics could include: how long it has taken for recovery plans to be developed (mean and extremes); how does / does not species status relate to parameters such as time since listing, time since recovery plan, use of recovery team, and use of implementation team.
- Consider allowing the panel to conduct interviews with randomized NOAA coordinators, in addition to the case study presentations.
- Identify a few key documents that are required for panelists to read, and the others recommended, in order to focus the panel and reduce potential workload.

⁷ *Editor's note:* During the panelists' report review process, one panelist suggested that the list of stakeholders to consider for inclusion on the review panel name "tribal nations." Indeed, the panel convened for this particular review did include a tribal representative but he had to withdraw from participating in the panel shortly before the panel workshop.

Appendix A – Panelist Reports

Reviewer 1: Final Report

Question 1: What species should have recovery plans?

General observations

The number of marine species listed on ESA is increasing, with almost a third (40 of 143) of species listed occurring in foreign waters, outside of US EEZ and/or high seas. In general, recovery plans are not created for foreign species as they are thought to be beyond the reach of US regulations, management, or recovery actions. However, there are a number of listed domestic species (28 of 103) that have not yet started a recovery plan. Additionally, there are several listed species with recovery plans that have a small percentage of their range within US waters, but the majority of their range occurs outside of the US.

Strengths and Challenges

The strength of an effective recovery plan can be measured in many ways, including its ability to provide a roadmap to species recovery by 1) identifying and increasing key stakeholder collaboration, 2) promoting awareness of the status of the species and need for conservation, 3) progress toward recovery and de-listing factors by providing guidance for key recovery objectives with measurable criteria, and 4) recommend actions to be implemented that will address critical knowledge gaps, decrease the impact of threats, and stabilize or increase the species population.

The challenges in creating recovery plans include the extensive amount of time, capacity, funding and collaboration needed to produce and implement an effective plan. Foreign species, including species that have the majority of their range outside of US waters, are particularly challenging as recovery actions implemented in US waters or high seas fisheries can have little impact on the conservation status of a species that is experiencing severe population decline and or is impacted by threats outside of US jurisdiction.

Recommendations

- Create a decision matrix to prioritize which species should have recovery plans, and if so, which type of plan might they benefit from (e.g. multiple species plan or ecosystem plan if they share similar localities and threats as other listed species, or potentially multi-national species plans if a significant portion of their range occurs outside the US).
- Consider setting a range or population threshold for exclusion (or conversely for mandating a multi-national plan) for species that have a very small percentage of their range in US waters (and there are no significant breeding sites within their small range in the US), and where the majority of known threats are operating outside of US jurisdiction.
- For entirely domestic species currently listed without a recovery plan, consider how to prioritize recovery plan development and/or partnering with other existing conservation

instruments (MMPA, State Conservation Plans, etc) to potentially streamline the recovery planning process. In other words, already established international, state or other conservation plans may be able to serve as the background to develop an ESA recovery plan with the statutory requirements (ie. Criteria) and comprehensive presentation of threats.

- Foresight is needed to develop potentially joint jurisdiction (USFWS and NOAA) guidelines for species that occur at the interface of freshwater, terrestrial and marine systems (such as mangroves, eels, salt marshes, etc). Foresight may also be needed to develop guidelines for species that are harvested commercially or for subsistence (such as fishery species, timber species, big game, etc), as there may be conflicting management actions and recovery criteria.

Question 2: How effective is NOAA Fisheries at recovery planning?

General Observations

There is great variation in the recovery planning process, varying from the use or absence of a recovery outline, the to the use or absence of existing management plans to aid in development, and varying levels of engagement with tribes, foreign nations and other partners. Some recovery plans are written by a few NOAA biologists (in the case of whales where existing MMPA plans may be available), while others are written completely by small or large groups of volunteer, external stakeholders and partners. The extreme variation reflects the reality of NOAA recovery coordinators operating within a variety of cultures, regions and threat issues, as well as the variation in people management, facilitation, diplomacy and group coordination skills of the NOAA coordinators and/or recovery planning teams. Overall, there is a general consensus that recovery plans are taking too long to produce (often much longer than the recommended 2-3 years), and as a consequence, tend to be outdated by the time they are finalized.

Strengths and Challenges

From the case studies presented, NOAA recovery plan coordinators comprise a highly diverse group that, although limited by funding and capacity, are dedicated to completing the recovery planning process as part of their numerous other position assignments. From the case studies presented, several NOAA coordinators have successfully worked outside of their roles as biologists, to act as group facilitators, educators, and diplomatic liaisons in order to engage and involve stakeholder and community groups in both the development and implementation of recovery plans.

Specific challenges include maintaining a balance between stakeholder participation and efficient plan development and implementation. In many cases, recovery plan development teams are comprised of volunteer, multiple stakeholders with different interests and visions for recovery, which can significantly slow down the plan development stage, but can result in a

more comprehensive, final product with improved external capacity, funding and collaboration for subsequent implementation of recovery actions.

Recommendations:

- Consider targeted invites to stakeholders and relevant agencies at the very beginning of the recovery planning process, to a scoping workshop to define a shared vision, roles, capacity and plan initiation. This may be especially important in joint jurisdiction species. Consider including targeted stakeholders who have the potential to increase international or external collaboration if appropriate, to ask for funding and to implement projects. May be important to define with the group the indicators of success not only in terms of species recovery and reduction of threats, but also in increasing collaboration amongst stakeholders and improving public awareness.
- After the initial scoping process, if possible consider forming a small scientific panel (4-5 people) to develop a rough draft of the recovery plan, to be presented to stakeholders in order to maintain engagement and receive feedback. Consider sequestration of the recovery plan writing team for a few days to focus solely on discussion and writing to help maintain focus and efficiency in producing a comprehensive draft.
- Consider offering training to NOAA coordinators in project management, facilitation, group leadership and diplomacy to assist with the people management aspect of the recovery planning process. From this training, a group of highly skilled, multidisciplinary NOAA coordinators might emerge that could assist various offices across the country in the recovery planning process as needed. Alternately, skilled facilitators and/or social scientists from the region could be hired (budget dependant).
- In regards to recovery plan team size and frequency of interaction, there does not seem to be a magic number. The success of recovery plan teams seems rather to be based on group cohesion, a strong team leader, and shared vision of the final product.
- As previously mentioned, the use of already completed conservation plans by other agencies, regional organizations or legal instruments (MMPA, etc) should be used to provide background, or as documents that could be amended, to meet the recovery plan documentation requirements.

Question 3: How effective are the final recovery plans?

Observations

All of the recovery plans presented in the case studies appeared to have followed the recovery planning guidance (published in 2004), with more variation in the older plans finalized before 2004. Through the case studies, it was evident that there is a huge variability in the quantity and quality of species data available for development of recovery plan objectives, criteria and actions, with some species having relatively large datasets available for population modeling and comprehensive threats assessment (e.g. leatherback sea turtle among others), while other

species lack significant baseline data in life history, ecology and population trends (e.g. smalltooth sawfish). The majority of teams presented recovery criteria that were objective, measureable and appropriate. However, recovery objectives and criteria could not always address the impact of threats or improving species demographics, especially in data-poor species. Additionally, some plans did not describe or use site-specific management actions.

From the case studies, most NOAA recovery plan coordinators seemed to think the format of the plans was effective in conveying information to the implementation teams, and the general public. However, as previously mentioned there was general consensus that the final recovery plans take too long to complete, are often out-of-date, and can be far too long for use by external stakeholders and the general public. It is important to note that indications of species population recovery (as an indicator of effective recovery plans) for use in status reviews can be complicated by unforeseen or unintended impacts to the species that were not accounted for in the recovery objectives and criteria.

Strengths and Challenges

For data poor species, some plans included recovery objectives and actions related to increasing knowledge/research on the species to fill critical gaps. This allowed for increased knowledge and flexibility to develop and improve recovery objectives, criteria and actions in updated plans. The detailed threat assessment (e.g. presented in the Loggerhead Sea Turtle case study) was an exemplary method to comprehensively cross-walk recovery objectives, criteria and actions against threats to make sure they were linked, as well as identified research needs on the impact of known threats that could not be quantified.

Identifying site-specific management actions for species with small ranges seemed to present a challenge. In some cases the recovery actions were not linked to recovery criteria, which makes it difficult to measure species recovery progress. In some plans, it was not clear who would implement the recovery actions. Additionally, some plans (such as Puget Sound Salmon) were challenged by trying to meet multiple objectives (e.g. species recovery and sustainable use). Again, due to the long time frame to complete the recovery plan, many were considered out-of-date, and required an update to recovery objectives, criteria and actions based on new information.

Recommendations:

- Many plans are too long and cumbersome for external stakeholders and the general public. Consider developing a comprehensive “cheat sheet” or web-based summary of key recovery objectives, criteria, and actions for the general public.
- There seems to be some confusion on how to define specific sites for management. Consider developing guidelines on how to identify and define sites for management. Sites for management should try to align with the biology of the species, in addition to political management units. One way to define sites can be to use the location and scope of the threats to delineate the site or sites for management actions.

- The threats assessment analyses (e.g. as recommended in the Recovery Plan Guidelines and as shown in the Leatherback Turtle case study) should be a required component of the Recovery Plan, and potentially be expanded to show the location or locations of each operating threat. This will allow for better identification of research needs on the impact of threats, on the locations for site-specific management actions, and for aligning the reduction of threats with recovery objectives, criteria and actions.
- Consider adding a required climate change impacts section to the recovery plans. A table or matrix describing the threat component of climate change (e.g. ocean acidification, increased temperatures, decreased prey, etc) and the potential impact on the species (could be positive or negative impact) should be presented, along a discussion of how these factors could impact current recovery objectives, criteria and actions.

4. How effective is NOAA Fisheries at monitoring and implementing recovery?

Observations

Given the limited capacity and budget to implement all actions described in recovery plans, the most effective monitoring and implementation of recovery actions occurs through strong partnerships with stakeholders and within the recovery implementation team. In a meta-analysis of recovery actions listed across all marine recovery plans, the vast majority have been started, but not yet completed. This may be a reflection of the observation that many recovery actions are open-ended, and demographic and threat criteria for meeting recovery objectives will take a very long time to meet due to the inherent reproductive biology of the species (e.g. in some cases slow-growing and low fecundity) and/or the persistence of significant threats. This may explain why, based on the case studies presented, some species populations appear to be still declining, or stabilizing (at low levels), while others may be slightly increasing, but with little indication of meeting criteria for de-listing in the near future.

All case studies presented appeared to have implemented effective monitoring programs, with the help of partners within the implementation team or externally, and recognized the need to adapt recovery actions and criteria to new information as needed. Many of the case studies presented also recognized the application of recovery plans to other NOAA programs and ESA sections, particularly section 7.

Strengths and Challenges

Consensus on plan implementation was improved by use of the Common Framework strategy (e.g. Puget Sound Chinook case study) to provide shared definitions and management across diverse sectors with varying capacity and resources to implement the plan.

Aside from funding and capacity, difficulty in sustaining recovery plan implementation partners over time can be challenging. Data from different sources (partners) can be un-standardized or collected by different methods, which can be challenging to synthesize into a coherent dataset to determine population trends or impacts of threats.

Recommendations

- Consider increasing use of social media and publicity campaign (Species in the Spotlight) as they can be used to raise public awareness, identify potential key partners and encourage conservation while the plans are in development.
- Create an internal decision-matrix to document progress of recovery plan and rank “effectiveness” as measured by a number of different factors. Could potentially have the NOAA recovery coordinator assess the effectiveness of the recovery plan themselves to allow for adaptive management and capacity building. These factors could potentially include 1) strength of implementation team and other partners, 2) progress on implementation of actions, 3) progress toward recovery criteria, 4) public awareness of species status, 5) species population trends, 6) change in impact of threats, etc.
- Consider having NOAA recovery coordinators attempt to specifically link recovery actions to criteria, objectives and de-listing factors to provide a clearer logic between actions and species recovery.
- Recovery plans can inform other sections of ESA, or other regulation, where there is some control in addressing threats. Consider agency-wide training on application and/or integration of recovery plans into other NOAA programs and ESA sections.
- Although time-consuming, building strong partnerships with external (including international) stakeholders for the development and implementation of recovery plans will increase capacity and potentially outside funding necessary to implement monitoring and recovery actions. Plan development can be streamlined by using existing plans from other agencies (if available) and potentially appointing or identifying a scientific panel to write (preferably in sequestration) the first draft for presentation to targeted stakeholders.
- Consider holding an annual or bi-annual meeting or workshop for all NOAA coordinators to meet and share progress, successes, failures, etc. so that they can learn from each and gain new strategies to overcome challenges.
- Lastly, consider identify specific people from other sections of NOAA and State Agencies that can work together to help support the workload and skill-set of NOAA recovery coordinators, where portions of their job duties might overlap.

Overall Recommendations on the Review Process

- To provide a wider perspective on the effectiveness of programs and to gain additional insight on solutions from other sectors, consider expanding the review panel to include representatives from international NGOs, intergovernmental agencies, other academic institutions, the corporate sector, etc.
- The case studies were an effective way to view a subset of the recovery plans and to speak directly with NOAA recovery plan coordinators. However, there were questions as to how well the case studies reflected all of the strengths, challenges and other

components of the recovery planning process. Consider providing the panel with a more detailed meta-analysis of the recovery plans before the review process.

- Based on the analyses of long-term trends of species populations (GPRA analyses based on increasing, decreasing, stable, or unknown population trends), on a few species show notable increasing unknown trends over the past 10 years, while several species show stable population trends. However, it is not known how reliable the indicators of decline are due to differences in reporting timeframes and data uncertainty. In addition to the 5-year reviews, is there a better way to track species progress toward Recovery Criteria and de-listing Factors? One way might be to keep a database of Recovery objectives, Criteria and Actions, with the % completed for each metric, in order to provide more detailed progress information.
- Although perhaps unwieldy, consider allowing the panel to conduct interviews with randomized NOAA coordinators, in addition to the case study presentations.
- There were many documents provided on the Recovery Planning Program website shared with the panel. Consider identify a few KEY documents that are required read, and the others that are recommended in order to focus the panel and reduce potential workload.

Reviewer Report on Protected Species Recovery Program Review

Reviewer # 2

Background

- **General Observations:** Recovery planning and implementation are complex and difficult issues
 - **Strengths:**
 - Committed, inventive staff
 - **Challenges:**
 - Limitless variety of situations (ecological, logistical, sociopolitical, etc.) to address; there are no one-size-fits-all solutions
 - Staff often have inadequate training and resources at their disposal
 - The bureaucratic side of recovery can slow and even impede implementation and species' recovery
- **Recommendations:**
 - Seek additional opportunities for support, with flexibility and opportunities for staff to use their creativity, within the program
 - Provide additional support, training, and tools for field staff
 - Look for increased efficiencies and effectiveness within the program

Key (Specific) Findings and Recommendations (as reviewer has comments on)

Question 1: What species should have a recovery plan?

- **Observations:**
 - **Strengths:** there is a system in place, guidance for making such decisions
 - **Challenges:**
 - Bowhead:* should the existence of other conservation mechanisms that seem to focus primarily on whaling management automatically lead to planning exemption? What if there are other threats to the species (climate change?)? What if the other conservation mechanisms do not include the ESA statutory requirements? Should these be made up in an abbreviated plan/appendix to the alternative plan?
 - Large-toothed sawfish:* should the fact the species no longer occurs in the US automatically lead to planning exemption? Should there not be a plan for returning it to the US, based on the 3Rs framework need for representation?
 - Trans-boundary species:* Are there thresholds for the significance (size, life history stage, etc.) of the species' occurrence in the US, below which planning for

mostly foreign species should be exempt?

- **Recommendations to address issue**
 - Consider adoption of existing conservation plans from other entities *providing* additional information for issues not adequately covered in the existing plan, AND making up any missing statutory requirements.
 - Revise guidance for planning exemptions to address trans-boundary thresholds issue.
 - Ensure that domestic and trans-boundary species w/o recovery plans do have recovery outlines

Question 2: How effective is NOAA Fisheries at recovery planning?

Observations:

- Under current conditions, RP development takes TOO long.
- Underutilization of Recovery Outlines to fill the gap between listing and RP
- Prioritization may not get enough attention to be effective
- Recovery teams may be beneficial, or problematic

Strengths

- Commitment and dedication of program staff.
- # Staff available for each planning exercise (as compared to FWS)
- Existing guidance, for plan development and the use and management of recovery teams, provides a good foundation for recovery staff.
- Flexibility: staff is allowed to tailor some planning aspects to the specific situation, as needed.

Challenges

- Finding ways to streamline the planning process to get more strategic implementation on the ground faster
- Recovery Teams above ~10 may be too large and unwieldy. Finding the balance to include the variety of expertise necessary, the stakeholders, etc., in the process, without allowing the size and constitution of teams to get bogged down in political interests, personalities, etc.
- Relationships: good working relationships can be crucial to overcoming some personality and politics issues
- Priorities: what are the goals? Keeping the most species from going extinct, getting most off the list? Retaining biodiversity? Can't prioritize effectively without identifying goal(s)
- Jt. Jurisdiction (NMFS, FWS, Tribes, States) can present special challenges for plan development and processing.

Recommendations to address issue

- Ensure *Recovery Outlines* are developed for all domestic and

tranboundary species immediately upon listing *and* used for the duration until a draft plan is available

- *Priorities*: Re-evaluate the guidance for developing species recovery priorities: are they being used, do they need revision?
- *Timeliness*: Start planning immediately upon listing so as to utilize the scientific analysis from the listing document and not have to do a separate or subsequent analysis. Note: this may necessitate tweaking the status assessment analysis to ensure it covers things like threats analysis at the individual, population, and species levels. Otherwise, that will have to be done subsequently, slowing plan development.
- *Recovery Teams*: Consider alternatives to the traditional approach to using recovery teams.
 - Target the use, size, and tenure of recovery teams to the specific needs of the situation. Appoint planning teams for specific scope and timeframe instead of the blanket 'develop a plan.'
 - Consider using expert elicitation as an alternative to a recovery team for all or parts of recovery plan development
 - Provide even more emphasis on the goals, roles and responsibilities, and ground rules of the recovery team functioning in the ToR. The approach used for the loggerhead team and public meeting use seems to have been very effective for that particular situation.
 - Foster relationships. Think hard before moving recovery staff around in mid-process
- *Assistance to recovery leads*: Provide species leads/coordinators with additional support in terms of planning and social interaction experts. For some situations this may be addressed by taking training in planning, facilitation, etc. For more contentious, high-visibility species, this may involve bringing in hired facilitators and/or planning 'SWAT' teams to work w species experts, etc.
- *Technical Assistance*: Provide more tools: templates, issue specific guidance, access to modelers, GIS, etc. Perhaps a tools website? Lists of experts to turn to?
- *Jt. Jurisdiction*: develop consensus on ground rules at the outset: what are the goals, roles, and operating rules for the various entities during the process

Question 3: How effective are the final recovery plans?

- **Observations:** Effective looking plans may or may not actually effect recovery
- **Strengths:**

- Descriptive background biology/ecology in RPs
- Recovery actions described
- **Challenges:**
 - The static nature of recovery plans that become obsolete while time and resources for updates and revisions are scarce
 - Balancing the need for conservation to start yesterday with the desire to get more information before making a decision (i.e., research).
 - Developing meaningful, objective and measurable recovery criteria (both demographic and threat-based)
 - Prioritization for implementation among large #s of recovery actions. The current 1, 2, 3 prioritization scheme is inadequate to target resources most effectively among actions for plans with as many as 50+ priority 1 recovery actions.
 - Designing plans to be more useful for s7 consultations, HCP development, etc.
- **Recommendations to address issue**
 - *Static Plans:* Consider use of more web-based supporting information on both underlying science and implementation activities, thereby allowing flexibility to update these elements while focusing plans themselves on the logic chain for the recovery strategy and statutory elements.
 - *Threats:*
 - Require systematic, transparent, logical threats assessments for all RPs (this may be within the plan itself, or in the status assessment which may be presented in a separate document - see below recommendations for restructuring recovery plan documents). Present summary/conclusions of TA in plan, or supporting documentation, in a user friendly, clearly understandable format that allows partners, stakeholders, etc., to buy in to the reasons for the specific recovery strategy, actions, and criteria in the plan. This assessment should provide the underpinnings for identification of better recovery criteria, site-specific actions, prioritization of action implementation, and links to more effective and supportive application of s7 and s10.
 - Use an agreed upon systematic taxonomy for threats. Some are already available (see <http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2008.00937.x/full> and <http://www.fosonline.org/fos->

news/beta-versions-of-the-iucn-cmp-threats-and-actions-classifications-available). This would allow sorting species by threat, facilitating development of generic threat abatement approaches. Much more efficient and likely more effective.

- *Recovery Criteria*: Expand on current RP guidance recovery criteria section discussion of the 3 R's, and provide tools for assisting in the development of demographic and threats-based criteria.
- *Criteria and Actions*: Seek opportunities for including adaptive management of the statutory elements in recovery plans. It is possible, albeit difficult, to build adaptive management directly into the criteria and actions of a plan. This is particular important where there is considerable uncertainty and more information (research) is required. This would not only improve the shelf-life of the plan, but also reduce the surprise element for stakeholders should changes in these elements be needed.
- *Action prioritization*: Prioritize actions within current 1, 2, 3 categories based on relative impact of threats (from threats assessment above) addressed by each action.

Question 4: How effective is NOAA Fisheries at monitoring and implementing recovery?

- **Observations:**
 - Implementation of certain recovery actions appears strong
 - Certain types of monitoring are well done, others lacking
 - Integration for implementation across program aspects (s4, s7, s10) seems spotty at best, dependent perhaps on personalities
- **Strengths**
 - Commitment of species' leads to implement recovery. Also appear to be open to adapting to the situations at hand
 - Implementation teams appear to improve plan implementation
 - Scientific capabilities to design the most effective and efficient monitoring protocols
- **Challenges**
 - Assessing species' status changes short of need for reclassification, as a function of plan/action implementation, is difficult and may require monitoring of additional parameters.
 - Monitoring resources remain limited
- **Recommendations to address issue**
 - Develop stronger ties w s7 and s10 programs
 - Monitor the effectiveness of recovery actions themselves
 - Identify interim benchmarks to facilitate assessing recovery effectiveness along

the way (e.g., ratio of repeat vs. novice nesters may provide indication of recruitment in sea turtle nesting colonies earlier than simply counting total # of nesters)

- Tie adaptive management to the results of monitoring
- Seek more resources for monitoring

Other

- **Observations:**
 - Climate change barely mentioned
 - Adaptive management barely mentioned
 - Little analysis of actual effectiveness of plans and implementation for recovery
 - The lack of meta-analysis hindered reviewers' abilities to extrapolate learning from the examples presented to the entire suite of species under NMFS responsibility
- **Strengths**
 - *Climate change:* Access to the best climate change science there is
 - *Adaptive management:* Access to modeling skills (science centers)
 - *Analysis for effectiveness:* potential monitoring capacity
 - *Meta-analysis:* the examples provided were very useful and instructive
- **Challenges**
 - Harnessing the science potential for the needs of the recovery program
 - Extrapolation from individual examples to a program-wide understanding
 -
- **Recommendations to address issues**
 - Strengthen ties between science centers and recovery program
 - Actively look for opportunities to engage in adaptive management
 - Structure recovery and implementation plans to be more flexible and adaptable
 - Seek ways to better assess effectiveness of recovery actions, and species' recovery
 - Examine program-wide statistics such as: how long it has taken for recovery plans to be developed (mean and extremes); how does, or doesn't, species status relate to parameters such as time since listing, time since recovery plan, use of recovery team, use of implementation team, etc. Some of these analyses could be tricky because of potential auto-correlations, but could prove very instructive.

Conclusions

- **Observations:**
 - NMFS' recovery program has been reasonably effective to date
 - The recovery workload is increasing rapidly, with little concurrent increase in resources
 - New tools are available to streamline the recovery planning process in order to put more implementation of recovery actions on the ground
 - New tools are available to streamline recover planning documents, enabling keeping planning documents more flexible and dynamic

- Program elements such as recovery, s7, s10, often seems to be uncoupled, hindering opportunities for synergies
- **Strengths:**
 - NMFS has a committed recovery workforce in place
 - NMFS has been willing to take the step of initiating this program review, and seek feedback and recommendations on its program
 - The program appears open to considering change
- **Challenges:**
 - Change is difficult
 - Increases in efficiency and effectiveness will be maximized by effecting modifications in other NMFS programs, such as the s7 program, and how species status assessments are currently developed by the NMFS Science Centers
 - Different aspects of the recovery process are influenced by different programs in NMFS.
 - Teasing out the effectiveness of species recovery vs. recovery planning, implementation, and external factors such as drought is not easy
- **Recommendations:**
 - Provide more support for field staff (training, facilitators, tools, modelers,
 - NMFS should investigate the potential for restructuring recovery plans so that plans:
 - Focus primarily on the recovery strategy (rationale) and statutory elements, allowing materials currently presented in the background and implementation sections to be more flexible and updatable.
 - Incorporate adaptive management, for both criteria and actions in the plans, as well as in the activities implementing plan actions
 - Provide more guidance to folks implementing s7 and s10
 - Only need to be revised when new information or monitoring indicate the need for significant changes in criteria or actions
 - Allow for some level of adaptive management within activities for implementing recovery actions.
 - Species status assessments should be designed to provide information beyond that necessary to inform listing and reclassification decisions.
 - In particular, status assessments should include a threats assessment examining stressors (their distribution, magnitude, species' responses, and relative impact to individuals, populations, and the species as a whole), to facilitate more synergies and effectiveness between the recovery **and** consultation programs. It would be most efficient if the threats assessment were included as part of the status assessment. Otherwise it will need to be done subsequently, out of sync.
 - If they do not currently, the predictive modeling in status assessments could include sensitivity and elasticity analyses to:
 - identify vulnerable life stages, and
 - evaluate the efficacy of various potential management scenarios
 - Monitoring should be targeted not only on size and distribution of populations, but also on effectiveness of individual recovery actions and benchmark parameters

Final 4/26/2016

measuring the interim trajectories of both threats and population growth

Program Reviewer Report from Panelist 3

19 April to 22 April 2016

Background

General Observations and Recommendation

- Format of the review (e.g., panel format, presentations, public, and use of panel only time) was good. I was able to ask questions when needed, but also able to reflect and work as needed.
- Materials provided were good. Requested items were quickly provided.
- The number of presentations seemed ok for the time available.
- Quality of the presentations ranged from good to very good.
- More in-person presentations would have been better. The ability to speak with many recovery leads face-to-face would be valuable in seeking out issues and possible solutions.

Key (Specific) Findings and Recommendations (as reviewer has comments on)

- **Question 1 What species should have a recovery plan?**
 - Observations
 - Strengths
 - Guidance document
 - NOAA Fisheries provides a rationale for not doing a recovery plan
 - Challenges
 - No external review of decision
 - No public comment
 - Recommendations to address issue
 - It was not clear to me if the guidance documents used by NOAA Fisheries clearly addressed when a species might not have a recovery plan. If not already addressed in the guidance documents, NOAA Fisheries should consider developing criteria for not developing a recovery plan. For example, if less than 5% of a listed species range is included in the U.S. and that portion of the range is not critical for the species survival, then a recovery plan is not required. Additionally, criteria also should include the U.S. adoption of other nation's (or organization's?) established recovery plans as the ESA recovery plan if it meets or can be amended to meet U.S. legal requirements.
- **Question 2 How effective is NOAA Fisheries at recovery planning?**
 - Observations
 - Strengths
 - Guidance document
 - Staff
 - Challenges

- Guidance document needs updating
 - Joint jurisdiction requires clarification or upfront agreement of expectations
 - Difficulty with team leader or NOAA Fisheries staff trying to facilitate team meetings
 - How to work in highly politically charged environments
 - Understanding the process and/or making it clear to participants
 - Making timely revisions to a recovery plan
- Recommendations to address issue
 - NOAA Fisheries is making effective use of available guidance documents to prioritize recovery plan preparation. Staff is competently applying that guidance to do recovery planning. However, the guidance documents may need to be updated.
 - Where recovery outlines have been developed, they appear to have been useful to help managers work towards recovery while a recovery plan is under development. Recovery outlines should be quickly prepared (e.g., within 60 days of listing) for all species for which a recovery plan will be developed. NOAA Fisheries should also consider developing recovery outlines even if a recovery plan is not anticipated to document the agency's intention and provide at least a minimal level of guidance for agency management staff, partners, and stakeholders.
 - The use of multi-species or ecosystem based recovery plans may not always be more effective than single species recovery plans. Where there is an ecological basis for including multiple species, the multiple species and/or ecosystem based plans have merit. However, additional upfront planning may be required to sufficient address such plans.
 - Effective engagement of tribes, states, foreign nations, and other partners in the recovery planning process is very important and very difficult. NOAA Fisheries can improve in this area. In particular, state and tribal fish and wildlife agencies need to be considered as co-trustees of the resource being managed where those agencies acknowledge and accept that responsibility. Where differences in management philosophies and understanding of the resource between NOAA Fisheries and state/tribal fish and wildlife agencies is vast, the parties need to at least keep lines of communications open and continue seeking some common ground.
 - The stability of a recovery team can be instrumental in developing an effective recovery plan and its implementation. Stability of the team should be a consideration when deciding upon membership. Members should have a commitment from their leadership for their participation on the team. NOAA Fisheries should provide an estimate (best guess) of the number and timing of meetings believed necessary to complete the plan.

- Teams should include management and research-oriented persons. I believe it is important to have representation on the team from the state fish and wildlife agency if they are willing and able to participate.
 - While I don't believe teams need to include all major stakeholders, I do believe major stakeholders need to have some avenue for input to the team. In my experience, that can often most effectively be accomplished through a state fish and wildlife agency person(s).
 - Also discussed was the use of dedicated staff that are experts in the requirements and process of developing recovery plans to be assigned to assist recovery teams with plan development. I support this concept as long as such staff do not replace species-specific management and research personnel on the team. NOAA Fisheries also should consider the use of professional facilitators for most teams and conflict resolution specialists on teams where significant conflict is likely.
 - Recovery plans need to be completed faster. NOAA Fisheries should consider a timeline something like the following: a recovery outline within 60 days of listing, a draft recovery plan within 1 year of the outline, a final recovery plan within 1 year of the draft recovery plan, and a mandatory revision within 2 years of the final to catch things overlooked in the speedy development of the plan as well as other changes. Then move to a more standard revision cycle of every 10 to 15 years, although more frequent revisions should be possible if needed to account for unexpected changes.

- **Question 3 How effective are the final recovery plans?**
 - Observations
 - Strengths
 - Staff
 - Guidance documents
 - Science Center for science information
 - Challenges
 - Stakeholder involvement
 - May increase time
 - May cause more conflict
 - May get more buy-in of final plan
 - Funding
 - Political aspects
 - Different agency philosophies may cause conflict, possible to the point of no cooperation
 - Powerful push back to plan
 - Using Section 7 to push recovery
 - Tracking effectiveness

- Revising the plan to stay current
 - Is the revision process too difficult to encourage more timely revisions
 - Getting effective partners involved and active
 - NOAA Fisheries can't do it alone
 - Time to get plan developed – out of date before it's done
 - Difficulty in developing site-specific management actions at the time of plan development
 - Jurisdiction issues if joint with USFWS
 - Leadership, finding a champion
 - Problems with transnational distribution
 - Recovery actions need to be tied to recovery criteria
 - Recommendations to address issue
 - From the case studies, identification of objective, measurable and appropriate recovery criteria may not have occurred in all cases, but this may be the result of plans being developed at different times. Recovery criteria need to be based on the listing factors that triggered listing. Once all of the recovery criteria are met, a five factor analysis should find the species does not need to be listed (assuming no new condition outside of what the criteria addressed has arisen).
 - NOAA Fisheries should consider making future recovery plans more of a web-based document so that users can click to see the portions of the plan they want or need to see without needing to read unwanted material. I also suggest consulting with people who specialize in the delivery of web-based information to ensure effective formats are used.
 - Many of the recovery plans presented in the case studies seemed to be out of date. This may be due to a revision process that is too onerous to be carried out as needed and/or lack of staff time and other resources to do revisions. NOAA Fisheries should consider implementing some sort of streamlined, expedited process for recovery plan revisions so that plans may be revised recovery plans more often and/or as needed by changes in species status, what is known about the species and its conservation, and/or partner and stakeholder involvement, etc.
- **Question 4 How effective is NOAA Fisheries at monitoring and implementing recovery?**
 - Observations
 - Strengths
 - Staff
 - Science Centers to help develop monitoring protocols and status assessments
 - Challenges
 - Funding
 - International differences in conservation philosophies
 - Politics, including international

- Moving from recovery team to implementation team – use the same or different people or a mixture.
 - Developing an effective way to track implementation progress
 - Ensuring that progress on completing recovery actions is making progress toward recovery criteria
- Recommendations to address issue
 - NOAA Fisheries cannot recover listed species alone, and the active involvement of partners and stakeholders is key to making recovery progress. The case studies ranged from little effective use by stakeholders to fairly effective use by stakeholders. NOAA Fisheries may be able to improve the effective use of recovery plans by stakeholders by ensuring the major stakeholders are included, or have input in, the development of recovery plans.
 - The use of an implementation team provides for more effective and accountable implementation of recovery actions. Partners and stakeholders are key components of effective recovery plans and may best be kept active and engaged in the plan through a recovery plan.
 - It is difficult to determine the effectiveness of the NOAA Fisheries recovery program. One way of viewing this is the number of species that have recovered and been removed from the list – believed to be one. Another way to view this is the number of species that have been removed from the list because they became extinct – believed to be zero. Overall, I believe the NOAA Fisheries recovery plan has been effective to very effective at pulling together partners and stakeholders, documenting threats and recovery criteria, and focusing conservation effort (a little on some species, more on others) on listed species. As such, it has been somewhat effective at overall recovery of listed species.
 - From the case studies, it seems effective partnerships were often maintained but sometimes not. NOAA Fisheries cannot recover species alone and the effective use of partners and stakeholders is important for the recovery program. The use of implementation teams helps to keep critical partners and stakeholders engaged and active in the recovery process. Where applicable, NOAA Fisheries needs to consider state fish and wildlife agencies as co-trustees of the listed resource, and expect those agencies to act as such if they are willing to accept that responsibility.
 - It appears from the case studies that NOAA Fisheries is using current technology in its recovery program, particularly the use of GIS and satellite-related technologies. It was not clear to me if effective use of social media was being used. Social media is a promising area for disseminating information and seeking buy-in from certain demographics.

NOAA Fisheries should explore effectively using this technology if not already doing so. Consulting with the right experts is important.

- Some of the case studies indicated some integration of recovery implementation with other NOAA Fisheries programs, but in most it was not clear that such integration was considered. Recovery is more likely to be successful with better integration of recovery implementation with other NOAA Fisheries programs, especially those associated with ESA Section 7 and Section 10. Development of recovery plans should consider how sections 7 and 10 may be used to help accomplish recovery criteria, and section 7 and 10 work should be informed by applicable recovery plans.

Conclusions

The current NOAA Fisheries recovery program is resulting in progress towards recovery for most of the species for which recovery plans have been developed. Strengths of the program include a professional, competent staff developing and implementing recovery plans and the availability of guidance documents to aid development and implementation.

There are a number of improvements to the recovery program that may increase the successes of the program. First and foremost is the development and maintenance of strong, durable, and stable partnerships, followed closely by significant and continuing stakeholder involvement. NOAA Fisheries cannot recovery species alone, and this is well recognized. The most significant partners in the recovery of a species may often be the other entities that are co-trustees of the resource with NOAA, including state and tribal fish and wildlife agencies as well as the natural resource agencies of other nations. In particular and where applicable, NOAA Fisheries must treat state and tribal fish and wildlife agencies as co-trustees of the resource, not just as another stakeholder, and expect those agencies to fulfill their co-trustee responsibilities. Where differences in management philosophies and understanding of the resource between NOAA Fisheries and state/tribal fish and wildlife agencies is vast, the parties need to at least keep lines of communications open and continue seeking some common ground.

Another recommended area of improvement is better integration of the recovery program with other NOAA Fisheries functions, especially the regulatory and incentive-based functions. Regulatory tools such as Section 7 consultations and Section 10 HCPs can be major tools to increase the success of recovering species. But to be most effective the recovery planners need to know what regulatory tools are available and how they work, and the regulatory staff need to know how recovery is envisioned to determine where they may best use the regulatory tools. There is evidence that some integration has occurred in the past, but tighter integration and communication between the regulatory and recovery staffs would be beneficial. Likewise, recovery is often more successful where clearly defined and incentive-based options are available to the regulated public. NOAA Fisheries can improve recovery success by devoting more time and talent to developing such options.

Finally, the recovery planning process needs to be faster. Recovery plans, once developed and implementation started, are benefitted listed species. But the longer it takes to get to implementation, the longer before those benefits start accruing. Recovery outlines can help managers conserve species while the recovery plan is being developed. One recommended timing scenario is developing a recovery outline within 60 days of listing, a draft recovery plan within 1 year of the outline, a final recovery plan within 1 year of the draft recovery plan, and a mandatory revision within 2 years of the final. The primary reason for the mandatory revision is to catch things that may have been overlooked in the initial development. Then a more standard revision cycle of every 10 to 15 years can be followed, although more frequent revisions should be possible if needed to account for unexpected changes.

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Reviewer Report on Protected Species Recovery Program Review

REVIEWER # 4

Dates 4/19/2016 – 4/22/2016

Background:

The ESA Recovery Program Review Panel was first presented with an overview of the ESA Recovery Program Review Process, and the Marine Fisheries Advisory Committee Report. The program provided an overview of Case Law on Recovery Plans and leadership expectations regarding the program review. We were provided Terms of Reference, a list of questions and general aspects for consideration and presented with several case studies. The presentations were selected to help the panel characterize the attributes and content of individual recovery planning efforts so that we could draw generalizations about recovery plans and Recovery Program effectiveness. This is the first time the Office of Protected Resources has implemented a Program Review.

The terms of reference for the recovery program review specify that the objective is to evaluate the current NOAA Fisheries recovery program to determine if the current recovery planning process results in recovery plans that are effective roadmaps for recovering the species as evidenced by whether the plans are being implemented by NOAA Fisheries and stakeholders, resulting in progress towards meeting the criteria so that the species may be delisted. Thus, the overarching definition of effectiveness for the recovery program is those events, conditions, or state of affairs that result in progress towards delisting the species (i.e., recovery).

General Observations and Recommendations

The recovery program has excellent staff and leadership, a strong mandate and authorities and clear guidance. The expectation of the agency is that the program staff coordinates the drafting, implementation and monitoring of the recovery of listed trust resources. The expectations are high, the work load is significant and the process and implementation demands a broad range of expertise and skillsets across diverse disciplines and geographies. ***From the case studies presented it is evident that significant resources, time and energy is devoted to recovery planning and a lesser amount to planning of recovery implementation strategies (e.g., financial or program funding targets to implement).***

The ESA has several sections that include additional tools for planning, leverage and implementation. Additional consideration and leverage has been employed in a few of the case studies, however ***the full breadth and depth of NOAA leverage through NOAA authorities, and internal partnering has not been used in any of the cases. Additional suggestions included use of all of the ESA toolbox and leveraging of both human capital and discretionary funding for recovery actions.***

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Key (Specific) Findings and Recommendations (as reviewer has comments on)
Question 1: What species should have a recovery plan?

Recovery Guidance
Legal Guidance

Observations

Listed species that are being impacted by factors that are under NMFS control and authority (e.g. habitat, water quality or quantity; aquaculture, harvest and hydro/FERC) should have a recovery plan.

Throughout the case studies, NMFS effectively identifies species that will benefit from the development and implementation of a recovery plan.

Foreign species were an area where specifics regarding when a recovery plan should be developed are vague.

Strengths:

- o Recovery Plans provide an area of influence a potentially proactive impact.
- o Recovery Plans are a point of engagement with stakeholders, heightening awareness; creating education And outreach opportunities.
- o Developing plans can build the stakeholder and partnership network necessary to advocate for recovery
- o Development of a recovery plan can serve to jump-starts the financial and business strategy planning

Challenges:

- o Recovery Plans are an investment of time and resources (take too long)
- o Prioritizing species that are in the greatest need is a challenge

Recommendations to address issue:

- The program prioritizes species that need recovery plans. The treatment of foreign species with respect to prioritization could benefit from clarification.

Question 2: How effective is NOAA Fisheries at recovery planning?

Case Study #1 Atlantic Salmon
Case Study #2: Elkhorn & Staghorn Coral
Case Study #3: Cook Inlet Beluga Whale

Observations:

Recovery Plan development is a priority for the agency staff and resources are dedicated to recovery planning efforts. Recovery plan development priority is given to species in critical decline and in most cases where they are facing the greatest known threats. In most cases biological and ecological limiting factors are understood. Management actions were targeted and provide a high probability for recovery.

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From all the case studies (that employed them) It appears that outlines are extremely helpful and increase efficiency and effectiveness of the recovery program especially if developed in partnership with stakeholders and based upon science and used in a timely manner. They provide boundaries and a framework for discussion. The Atlantic Salmon Case study explicitly states that a recovery plan outline would have expedited the process.

Multiple benefit, multi-species recovery or ecosystem plans provide a leverage opportunity that has the potential to align federal resources, create efficiencies across federal mandates and leverage regulatory authorities. Multi-species recovery planning makes intuitive sense when listed species co-occur in a geographic area, are taxonomically related, or face similar threats, because a multispecies or ecosystem-based recovery plan can coordinate and integrate recovery efforts efficiently. The Corals case study validates such an approach but others could be expanded upon to include multiple species (e.g., Orca and Puget Sound Chinook) to address a comprehensive ecosystem approach to recovery leveraging different authorities and programs. The multi-species approach employed by the Corals team was very effective and efficient as they adapted their planning, threats analysis, prioritization and the composition of their team not only with respect to the species, but also with consideration to the political realities they faced.

NMFS is making use of conservation plans, incorporating ecosystem plans and stakeholder management plans. The use of additional tools such as those employed by USFWS (CCAs) does not appear to be widely used by NMFS. Use of additional tools under ESA and in combination with recovery planning efforts is an area worth additional strategizing.

A few of the recovery teams were inclusive, large and diverse and seemed to function well which implies good leadership and inclusion of a diverse disciplines and strategic engagement. A few case studies mentioned less diverse membership on the teams (primarily limited to scientists and no implementation or ecosystem recovery implementation-types, few funding or partnership development strategists). These specialized teams successfully developed a plan focused primarily on research which does not directly lead to recovery. It is implied that these teams needed to develop a strategy to determine limiting factors. Such a step might best be handled prior to engaging an entire recovery team as it would help target the skillsets needed and avoid overtaxing an already taxed voluntary workforce.

Where foreign nations are engaged it appears to go well, though limited in scope, and in number of engagements. There was much discussion about this in the panel; the need to ignore boundaries and think bigger and use NMFS leverage even in areas where authorities do not necessarily apply.

Outside of the recovery plan development process it was unclear from the case studies to what degree a peer review process was employed.

The REV approach allowed the Atlantic Salmon Planning Team to lump recovery actions in the recovery plan resulting actions and project level activities in an implementation plan that could be used for immediate action but could also be easily updated. This approach helped to establish benchmarks that provide an incremental methodology addressing recovery. Identifying threats is critical in setting the timeline for recovery planning. Ensuring species survival and abating the most significant limiting factors may be appropriate and feasible by considering an implementation strategy through assessment tools such as REV surveys and establishing and adaptive management framework.

Strengths:

- Employing a streamlined approach like Recovery Enhancement Vision streamlines and expedited the planning development process and allowed for real-time adaptive management as newer information became available.

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- Inclusive and diverse recovery teams
- Phasing including pre-planning allowed for a more strategic engagement with stakeholders

Challenges

- Multi-jurisdictional layers adds complexity and can complicate and delay plans
- Existing plans and frameworks, although useful should be considered but not be a rigid framework
- Lengthy timelines results in staff turn-over that does not facilitate fast execution of a planning.
- Inclusive and diverse recovery planning team composition without resulting efficiencies
- Funding and logistics for big teams
- Consideration of peer review (is FACA a consideration here?)
- Recovery teams are voluntary and require diverse skillsets and long-term commitment
- Transitioning a recovery plan into an implementation plan with measurable results
- Fatigue with the process
- Plans generally have no “interim milestones” listed.
- Recovery Plans are guidance, they are voluntary, not regulatory and not enforceable

Recommendations to address issue:

- Multi-species and ecosystem recovery potential should be considered when determining if a recovery planning process. The program is effective, addressing mandate and need and prioritizing actions. Consideration might be given to streamlining the recovery planning process by leveraging internal NOAA staff across programs and USFWS tools.
- Recovery plans may be more effective if they were developed within two years of listing (draft within 1 year) and encompassed an adaptive management strategy that allowed for flexible updating.
- Consideration could be given to the use of Species Survey Assessment (SSA) developed by USFWS to enhance their recovery planning efforts. The SSA provides the structured and transparent process for assessing the species status as a function of its biology and resource needs for long-term viability and the current state of those needs.

Question 3: How effective are the final recovery plans?

Case Study #1: Smalltooth Sawfish

Case Study #2: Johnson’s Seagrass

Case Study #3: Loggerhead Sea Turtle, Northwest Atlantic

Case Study #4: Puget Sound Chinook

Observations:

Several of the case studies provided (Sea Turtle, Chinook) have very detailed roadmaps for recovery; clear descriptions of site-specific management actions, habitat actions, regulatory and policy actions leading to recovery implementation.

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Recovery plans that are tailored to a species' biology, ecology and (most importantly) threats are more effective and provide clarity. Well defined threats are easily used to develop criteria that will provide milestones and tracking of threat eradication.

In a few cases where threats were not understood research to address data gaps is necessary, in at least one case the recovery plan was a detailed research plan.

General guidance is provided for drafting recovery plans and as a result the plans are vastly different in the information and priority strategies for implementation.

Many plans are data heavy and scientific in nature, which provides significant challenges for implementation.

Many plans are extremely long which provides a significant challenge for implementation.

Lengthy, data heavy plans that are scientific in nature do not lend themselves to effective or timely updates and are a challenge for the stakeholders charged with implementation to translate to the public and/or potential funders.

Plans that included an implementation team or included individuals with implementation skills or focus helped to insure successful actions resulting from the plan.

Strengths:

- Comprehensive and detailed
- Strong threats assessment
- Explicit detail of recovery actions

Challenges:

- Plans are often data heavy and easily fall out of date
- Staffing is limited and recovery actions require champions
- Funding is limited and needs of the species tend to grow to be overwhelming
- Specificity is difficult to achieve and harder to update
- Time lags for monitoring and feedback on species response
- Monitoring success of recovery of the species inconclusive so feedback on improvement is difficult

Recommendations to address issue:

- The plans are effective and may benefit from additional strong outreach, more inclusive staffing, leverage of partners and funding through outside sources.
- Consider coordinating with other NOAA offices on protection and restoration priorities to insure that discretionary programs and regulatory requirements are being driven to address recovery action. This coordination would provide additional leverage and use of recovery plans.

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- Recovery plans should identify critical, “can’t lose” habitats to provide support for jeopardy or adverse modification determinations in Section 7 consultations.
- Plans should consider identifying high-value restoration opportunities, in order to provide guidance for advance mitigation or mitigation banks; this is consistent with USFWS mitigation policy.

Question 4: How effective is NOAA Fisheries at monitoring and implementing recovery?

Case Study #1: North Atlantic Wright Whale
Case Study #2: Leatherback Sea Turtle, Pacific
Case Study #3: Sacramento River Winter-Run Chinook
Case Study #4: Hawaiian Monk Seal

Observations:

All of the case studies presented demonstrated effective and innovative monitoring and most demonstrated strong recovery implementation.

In most cases recovery actions are on-going and being over extended periods of time and in collaboration with several partners and using innovative technology.

The program case studies demonstrated effective monitoring of recovery progress (i.e., is the species responding positively to recovery actions) and the use of the information to inform changes to recovery criteria and actions and/or revise and update the recovery plan. At times, it was noted that updates can be labor intensive and cumbersome.

NOAA Fisheries continues to maintain partnerships and does reach out to stakeholders on recovery planning progress, in many cases NOAA counts on partnerships to acquire the data necessary to monitor recovery and implementation actions often rely on others for implementation.

Many examples were provided regarding the use of current technologies and social media. These solutions are innovative and efficient and provide an added benefit of public awareness.

Many of the case studies did demonstrate effective integration of recovery implementation with other NOAA Fisheries programs, but there are many other NOAA programs that could be integrating recovery.

Strengths:

- Innovative technological solutions to monitoring
- Partnerships and data sharing
- Linkage to recovery action

Challenges:

- Explicit links to recovery actions and adaptive management framework

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- Explicit monitoring of management and regulatory actions
- Outreach to the public to share the results

Recommendations to address issue

- The program is effective at monitoring and implementation of recovery.
- Suggest regulations and/or policies requiring consideration of recovery plans during consultation with other federal agencies.
- Design a requirement of short and long-term milestones to be used to gauge success and illustrate trends resulting from the plan, quantitative if possible, qualitative but specific if necessary.
- Promulgate guidelines specifying what federal agencies need to do to comply with their responsibility to use their authority to carry out programs for the conservation of species (16 U.S.C. § 7(a) (1)), specifying that federal agencies with substantial conflicts with endangered species must develop conservation plans that are consistent with species recovery plans.
- Develop and implement section 7(a) (1) conservation programs in partnership with Federal agencies.
- Further leverage Section 6 to develop cooperative agreements to work together would allow the States to have more influence, ownership and accountability for ESA and would foster the relationship and collaboration between recovery, regulatory and habitat restoration.
- Section 7 and Recovery: (Lifted from the West Coast Regional Guidance on incorporating Recovery into regulatory actions) In the West Coast Region of NMFS, most Section 7 consultations are for very small projects that, individually, do not jeopardize ESA-listed species. Overall, Section 7 consultations result in a net loss of habitat. Therefore, work to provide timely completion of consultations undermines efforts to recover ESA-listed species.

Conclusions:

The Protected Resources Recovery Program is very effective; meeting the legal requirements and in every case presented progress toward recovery. Case presenters presented challenges and acknowledged that recovery may not be reflected in actual numbers of animals given their life histories and cycles, but progress defining actions to address limiting factors is being made. When a species is listed, priority is given to developing recovery teams; the teams form partnerships, committees are chartered, recovery plans are written and all are being implemented and actions reported. There are potential areas within the process that would benefit by the addition of cross-office and crossline coordination that could increase the efficiency and effectiveness of the plans. Overall, the process machinery is effective, the program is effective and efficient and successful.

Review of NOAA Fisheries' Protected Species National Recovery Program

-- Final Report from Panelist #5

24 April 2016

Introduction and Background

On 19-22 April, 2016, NOAA Fisheries' Office of Protected Resources (OPR) conducted a review of its Protected Species National Recovery Program. This review was part of a larger cycle of reviews that NOAA Fisheries is conducting, to date, all focused on NOAA Fisheries' science enterprise. OPR's Recovery Program Review is the first to be conducted on NOAA Fisheries' management programs. The overarching objective of the review was to address the following:

Does the current NOAA Fisheries Recovery Program result in progress towards recovery, and what improvements to the Recovery Program would increase the chance of recovering species?

The review panel was explicitly charged with reviewing the National Recovery Program's effectiveness with the following overarching questions in mind:

1. *What species should have a recovery plan?*
2. *How effective is NOAA Fisheries at recovery planning?*
3. *How effective are the final recovery plans?*
4. *How effective is NOAA Fisheries at monitoring and implementing recovery?*

Each of these questions was accompanied by a specific list of aspects to consider in evaluating the program's effectiveness. A comprehensive list of these can be found in the review Terms of Reference. These Terms of Reference and other review details (, e.g.agenda, presentations, supporting materials, review panel composition) can be found on the review website:

<https://sites.google.com/a/noaa.gov/nmfs-pr-recovery-program-review/home>

The review consisted of two overview presentations followed by a series of case studies, each focusing on an existing NOAA Fisheries Recovery Plan. These case studies represented a wide range of species, habitats, successes, and failures. This reviewer commends Recovery Program staff for including problematic case studies as well as shining stars. Such openness facilitates improvements. Below are my observations, most accompanied by recommendations in hopes that they are helpful for improving what is, even in its present form, a strong program.

Challenges and Strengths

The Recovery Program regularly faces significant challenges. 1) The scope is large geographically (spanning diverse habitats in the Atlantic and Pacific oceans, estuaries, bays, coasts, and terrestrial watersheds), and taxonomically (including vertebrates and invertebrates, animals and plants), and the

Review of NOAA Fisheries' Protected Species National Recovery Program

program must address a broad suite of anthropogenic perturbations and stakeholders. 2) NOAA Fisheries shares jurisdiction for many species with other Federal and state agencies. Strong collaboration, effective communication, and clarity of roles and responsibilities are, therefore, critical. 3) The knowledge base for some listed species is skeletal, and hinders development of effective plans.

Yet there are significant strengths and the greatest of these are the individuals associated with the Recovery Program - clearly talented, motivated, innovative, and dedicated, in some cases, extraordinarily so. Additionally, NOAA Fisheries' leadership at multiple and to the highest levels is clearly knowledgeable and engaged.

Unequivocal evidence of species recovery as a direct result of Recovery Plans was rare in the case studies. Yet, in many cases, these plans clearly provide useful roadmaps/blueprints for directing resources, guiding implementation of other pieces of the Endangered Species Act (ESA), and developing partnerships. This "bureaucratic recovery" (a term used in a public comment during the review and one which I like) is valuable in its own right, and would seem to facilitate subsequent species recovery.

Specific Observations and Recommendations

Question 1: What species should have a Recovery Plan?

1) Recovery plans exist for only a subset of listed species. The knowledge base for guaranteeing that listed species without plans and non-listed species (also with no plans) will remain healthy relies on comprehensive and regular monitoring. Yet in many instances, no such monitoring exists. Recovery Plans exist for many transboundary species but those entirely outside of US waters rarely (if ever?) have a Recovery Plan, despite the fact that the US often plays a major role in driving the factors responsible for population decline. I believe the NMFS and FWS Interim Recovery Planning Guidance could benefit from review and revision with these concerns in mind (see Recommendation 5).

Question 2: How effective is NOAA Fisheries at recovery planning?

2.1) The Recovery Plans take too long to produce. The time period between initial listing of a species and publication of the final Recovery Plan in the case studies presented to us ranged from years to over a decade. The consequent problems are varied and severe. I recommend the following to facilitate streamlining of this process and shorten the time period from initial listing to publication of the final Recovery Plan:

- a) Develop criteria (quantitative if possible) to provide guidance regarding whether to establish a Recovery Team for Recovery Plan construction or have the plan produced by a single individual.
- b) Establish positions that are dedicated Recovery Plan Production Experts. These positions could reside within OPR and/or one or more Regional Offices, as appropriate. Recovery Plan

Review of NOAA Fisheries' Protected Species National Recovery Program

Production Experts should be schooled in the statutes, Recovery Plan guidance documents, and effective writing (i.e., the process of producing a Recovery Plan). Each Recovery Team should include one of these persons. Of note, this team member will not be expected to provide expertise associated with the focal species, habitat, geography, stakeholders, or other plan-specific topics, but will ensure that team members with these areas of expertise are not required to acquire skills and knowledge associated with producing Recovery Plans.

- c) Develop a more formalized template for Recovery Plans to provide structure, consistency, and guidance (see Recommendation 3.1).
- d) To the greatest extent possible, use information produced from the status reviews associated with the listing process as the analogous piece (e.g., background and status) for the Recovery Plans (rather than re-creating this piece independently).
- e) Incorporate a threats assessment as a primary focus of the Recovery Plan (see Recommendation 3.2).
- f) For plans written by a Recovery Team, pre-schedule meetings and stick to the schedule; consider building in dedicated and sequestered meeting time for writing the plan.
- g) Enforce internal review timelines for penultimate draft Recovery Plans.
- h) Transition from hard-copy Recovery Plans to virtual plans available on the internet. For each plan, consider de-coupling the background (status) piece from the threats/criteria/actions piece, though the two should be linked (electronically on the internet), so that each component can be updated independently. Consider the USFWS "Species Status Assessment" as a potential model for accomplishing this.

2.2) Some Recovery Plans are clearly too long and overly-comprehensive. This negatively impacts the ability to keep them current and can contribute to their being inaccessible to managers (for implementation of other pieces of the ESA, for example – see 4.3) simply by virtue of their overwhelming nature. I recommend that Recovery Plans place greater focus on threats assessment as a central and primary piece of the plan with a goal of shortening the length and focusing the content on actions that pertain directly to recovery (see Recommendation 3.2).

2.3) Recovery Team composition is a critical component of effective Recovery Planning. The case studies presented in the review provided examples where team dynamics caused problems and examples where team dynamics worked smoothly. Building on lessons learned from these case studies, I recommend a more formalized and consistent approach to team composition (allowing for relaxation if needed, on a case-by-case basis). In particular:

- a) Consider a Recovery Team structure that includes a split between stakeholders (one component of the team) and scientists (a second component) per the model used by the Cook Inlet Beluga Recovery Team, so as to allow for input from all critical parties without impeding forward progress. Think critically about the number of nodes at which each of these components interact and have a clearly defined role and expectations for stakeholder involvement.

Review of NOAA Fisheries' Protected Species National Recovery Program

- b) Consider clarifying roles and responsibilities for team members (e.g., scientific input on focal species, stakeholder input from the NGO community) and include a dedicated Recovery Plan Production Expert (see Recommendation 2.1.b).
- c) Invite only those individuals known to be fully committed and engaged in the process as team members.
- d) Consider adding one or more team members with dedicated expertise in sociology, economics, and other social sciences.
- e) Keep the team as small as possible without sacrificing comprehensiveness (“more does not equal better” per the Cook Inlet Beluga Recovery Team recommendation).

2.4) There was not much discussion pertaining to the use of multi-species or ecosystem-level Recovery Plans, though the potential for their use in the context of recovery is clear. I recommend that the threats assessment (see Recommendation 3.2) be standardized so that the results for each plan can be aggregated to look for efficiencies across species and regions. I further recommend that this analysis be conducted periodically (e.g., every ~5 years) by OPR Recovery Program staff to investigate the potential for combining plans into higher-level aggregates, thereby achieving greater efficiency.

Question 3: How effective are the final recovery plans?

3.1) Many of the case studies explicitly pointed out the need for more prescriptive guidance to ensure structure, consistency, timeliness, and specificity. I recommend that OPR's Recovery Program staff develop a more formal Recovery Plan template to provide structure, consistency, and guidance to the plans themselves, and to ensure that the plans contain all required elements. (This recommendation duplicates 2.1.c.)

3.2) The Recovery Plan case studies varied greatly with respect to the degree of specificity of actions, degree of measurability, and relatedness to recovery. I recommend that all Recovery Plans include a threats assessment table and associated text, as a mandatory and primary component (per the Northwest Atlantic Loggerhead Sea Turtle Recovery Plan case study). The actions and criteria in the plan should flow directly from this threats assessment so as to guarantee that they are directly related to facilitation of recovery, should explicitly identify who will carry out the actions, and should explicitly state quantitative goals.

Question 4: How effective is NOAA Fisheries at monitoring and implementing recovery?

4.1) Few of the case studies included an explicit analysis of the effect of management/mitigation actions on the focal species. A notable exception was the Hawaiian Monk Seal case study. Such analysis is hugely helpful in assessing the value/impact of a particular action on recovery of the species. I recommend that the Recovery Plans include, as a mandatory component, a formal and regular

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"management strategy evaluation" exercise. The Recovery Program should consider partnering with the relevant/appropriate Science Center(s) (see Recommendation 4.2) to provide this expertise.

4.2) The degree to which the management/regulatory piece of the Recovery Program is linked with the science piece varied greatly between the case studies presented at the review. There were clearly some examples of strong linkages, and some that appeared almost entirely decoupled. To this reviewer, the former seemed to be more successful at implementing Recovery Program goals than the latter. Related is the current fiscal climate in the agency, with clear constraints on budgets, people, and infrastructure; this was a pervasive theme throughout the review. I recommend that the agency encourage and reinforce tight linkages between the management and science sides of NOAA Fisheries, at leadership levels and with deliberate messaging to staff regarding the value of these tight linkages, so that the default source of science required by the Recovery Program should be the NOAA Fisheries Science Centers. There are clear and strong benefits to NOAA Fisheries of this partnership in terms of leveraging funds, expertise, and infrastructure. The default partnership should be between Regional Offices and Science Centers within the same regions. That said, the Science Centers are increasingly moving toward embracing the concept of Centers of Excellence so it would be entirely appropriate for managers in one region to request science from another according to required expertise.

4.3) The degree to which the Recovery Program is integrated with implementation of other NOAA Fisheries programs, especially other pieces of the ESA, seemed to vary broadly, depending on the particular case study. Tight integration would seem to result in synergistic impacts on recovery progress. Clearly the agency needs to improve this integration; I am at a loss as to how to provide an explicit action that would result in better integration but recommend that OPR staff give this serious consideration.

Overarching Observations and Recommendations

5) The NMFS and FWS Interim Recovery Planning Guidance could, according to comments made during the review by Recovery Program staff, benefit from review and potential revision to clarify the goals/objectives (e.g., recover the greatest number of species?, maximize the number of recovery plans?), and to increase the rigor associated with categorization and prioritization. I recommend that OPR's Recovery Program staff conduct a thorough review and, if appropriate, revision of this interim planning guidance with this in mind, that such reviews be conducted on a regular (e.g., 5 year) basis, and that they include partnership with NOAA Fisheries' Science Centers through the PR Board, recently implemented PR workshops, and other similar fora.

6) There was wide variability in the effectiveness of the Recovery Plans chosen as case studies. Some were clear successes and some were much less so. I recommend that OPR engage in a dedicated meta-analysis project designed to identify a set of general and transferable rules for success/best practices for

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producing effective plans. This meta-analysis should include all plans in the program, and for each, identify critical components, and establish quantitative metrics for evaluating success.

7) Transboundary species present special challenges, as evidenced by a number of case studies and presenters. Management/mitigation actions, understandably, tend to be US-focused. Yet in some cases, a disproportionate focus on US-based threats can backfire. A well-known example is “transfer effects”, whereby constraints on bycatch of US fisheries results in a transfer of the bycatch problem to foreign fleets. This can alienate US fisheries with no benefit to the bycaught species. I recommend that Recovery Plans incorporate a holistic approach to recovery actions to the greatest extent possible, so as to incorporate all habitats, life stages, and threats. Recovery actions should be prioritized based on the magnitude of the threat and/or benefit of the action.

8) The Endangered Species Act and NMFS and FWS Interim Recovery Planning Guidance contain language that is vague and subject to multiple interpretations (e.g., “immediate extinction”, “significant decline”). Discussion during the review confirmed that this has the potential to cause confusion and result in inconsistent treatment across species. I recommend that OPR conduct a workshop to investigate the degree to which more precise, and when possible, quantitative interpretations of such language would benefit the Recovery Program, and that OPR consider making this a collaborative effort, with input from the NOAA Fisheries Science Centers.

9) Climate change is real and pervasive. Continuing to keep threats associated with climate change as an important piece of the recovery dialog can be helpful. I recommend that every recovery plan explicitly include climate change as a potential threat in the threats assessment piece, even when direct actions to mitigate those threats may not be apparent.

Reviewer #6
NOAA Fisheries ESA Section 4 Review
19-22 April 2016

Background: The National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (“NOAA Fisheries”) convened a panel to review and evaluate the agency’s recovery planning process under Section 4(f) of the United States Endangered Species Act (“ESA”), 16 U.S.C. § 1533(f), to (1) determine whether it results in recovery plans that are effective roadmaps for recovering the species, and (2) provide recommendations for improvements to the recovery program that would increased the likelihood of recovering species.

Under the ESA, NOAA Fisheries is required to develop and implement recovery plans for threatened and endangered species under its jurisdiction “unless [it] finds that such a plan will not promote the conservation of the species.” *Id.* § 1533(f)(1). These plans provide “for the conservation and survival of endangered species and threatened species,” *id.*, where “conservation” means “to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary,” *id.* § 1532(3). *See also* 50 C.F.R. § 424.11(d)(2) (“Recovery. The principal goal of [NOAA Fisheries] is to return listed species to a point at which protection under the Act is no longer required.”).

General Observations and Recommendations

Question 1: What species should have a recovery plan?

Observations: We were asked to consider whether NOAA Fisheries effectively identifies species that will benefit from the development and implementation of a recovery plan. The ESA provides that, “in developing and implementing recovery plans, [the Secretary] shall, to the maximum extent practicable—(A) give priority to those endangered species or threatened species, without regard to taxonomic classification, that are most likely to benefit from such plans, particularly those species that are, or may be, in conflict with construction or other development projects or other forms of economic activity.” 16 U.S.C. § 1533(f)(1) (emphasis added). Of the species for which NOAA Fisheries has determined a recovery plan would not promote conservation, the vast majority are wholly foreign species. Others include species whose historical range lies within in the United States and certain transboundary species.

Strengths:

- NOAA Fisheries focuses its recovery planning efforts on domestic and selected transboundary species—i.e., those species over which the United States has sufficient jurisdiction to facilitate effective recovery planning efforts. This focus allows the agency to target the use of its limited financial and human resources to species for which recovery planning efforts have the best chance of success.

Challenges:

- Conservation needs remain critical for listed foreign species, species whose historical range was within the United States (but which no longer range within U.S. waters), and

those transboundary species for which NOAA Fisheries has not engaged in recovery planning.

- The criteria for determining which transboundary species receive a recovery plan (e.g., loggerhead sea turtle) and which do not (e.g., bowhead whale) are unclear.
- There are twenty-six (26) species on the threatened and endangered species list for which recovery planning has not yet started.
- The decision whether to produce a recovery plan is made internally, with no opportunity for public comment. This prevents the public and independent scientists from providing the agency with information that might assist or guide NOAA Fisheries in making recovery plan determinations.

Recommendations to address issue:

- Consider whether and how international partnerships, multi-lateral environmental agreements, and partnerships with non-profit organizations and academics might be leveraged to assist with the recovery of those species for which no recovery plan will be completed.
- Do not discount historical range when determining whether to produce a recovery plan for a species. Historical range may be appropriate future range, and reoccupation of that range may be required if a species is to truly recover (i.e., become a self-sustaining population no longer requiring the protections of the ESA).
- Develop clear guidelines to determine when it is appropriate to conduct recovery planning for transboundary species.
- Commence recovery planning for species for which such planning has not yet started as soon as feasible. Ideally, recovery plans for listed species will be completed within the 2.5-year time frame provided by NOAA Fisheries policy. See U.S. Fish & Wildlife Serv. & Nat'l Oceanic & Atmospheric Admin., Endangered and Threatened Wildlife and Plants: Notice of Interagency Cooperative Policy on Recovery Plan Participation and Implementation Under the Endangered Species Act, 59 Fed. Reg. 34,272 (July 1, 1994) [hereafter "Interagency Cooperative Policy"].
- Consider allowing public comment on recovery planning decisions. Such comment opportunity could be informal rather than formal. Opportunity for public comment would provide transparency and allow for consideration of information (including information from independent experts) about which the agency might otherwise be unaware.

Question 2: How effective is NOAA Fisheries at recovery planning?

Observations:

Strengths:

- No ESA-listed species under NOAA Fisheries' jurisdiction has gone extinct.
- Recovery outlines have proven effective templates for recovery plan development in numerous cases.
- Recovery teams, when well-designed, facilitate recovery plan development and bring needed expertise and perspectives to the recovery planning process.

- Engaging independent scientists on recovery teams can supplement agency resources (human resources, financial resources) and provide needed expertise.

Challenges:

- Certain species are data poor, and drafting an effective recovery plan is challenging and time-consuming.
- Low funding and staffing levels, in addition to staff turnover, make recovery planning challenging.
- The ESA’s “best available science” information standard¹ does not apply to recovery plans.
- Joint jurisdiction (*i.e.*, jurisdiction over a species by both NOAA Fisheries and the U.S. Fish & Wildlife Service (“FWS”)) can be challenging, as the different wildlife agencies may have different philosophies and management strategies.
- While some within NOAA believe that the 2.5-year timeframe² for finalizing a recovery plan after a species’ listing is overly-optimistic, other presenters cautioned that extended timelines for recovery plan production cause numerous problems. For example:
 - Relying on unpaid volunteers to do much of the work of recovery planning over an extended period of time is unrealistic, leading to team member turnover and subpar recovery planning documents.
 - The longer the time frame in producing a recovery plan, the more likely the science and information upon which the recovery team is relying in drafting the plan becomes obsolete and the more “catch up” the team has to do in producing a current plan.
- Full representation of a diverse stakeholder base on the recovery team itself complicates plan production.
- While independent, external peer review can maximize recovery plan effectiveness and provide legitimacy and transparency to the recovery planning process, it is used inconsistently and without the benefit of clear guidelines as to when it should be used.
- Recovery planning is seen as ineffective because so few species have been removed from the list of threatened and endangered species.

Recommendations to address issue:

- Limited data & nimble plans:
 - Good data is invaluable for effective recovery planning efforts. However, for data poor species, such data is by definition lacking. In those cases, producing a plan with limited data is better than producing no plan at all. In such circumstances NOAA Fisheries should proceed with the information at hand. Other sections of the ESA require the agencies to use the best available science¹—not the best science possible. Courts have upheld this distinction, finding that a lack of the

¹ See, e.g., 16 U.S.C. § 1533(b) (“The Secretary shall make determinations [on listing and delisting] solely on the basis of the best scientific and commercial data available.”).

² See Interagency Cooperative Policy (“the Service will ... [d]evelop recovery plans within 2 ½ years after final listing”); (“Nothing in this policy is intended to change the current policy of developing recovery plans within 2 ½ years after final listing of a species (18 months for draft recovery plan and a final recovery plan within an additional 12 months of the draft).”).

best possible data is not an excuse for inaction.³ NOAA Fisheries should use 5-year reviews and other opportunities to revise the recovery plan as needed, but it is important for the agency to begin implementing recovery plan actions rather than delaying plan implementation to conduct more research (or producing a plan that relies heavily on research rather than action).

- Recovery outlines can be especially useful for data-limited species. This outline can focus on basic research and monitoring needs, and allow NOAA Fisheries to begin collecting the data and filling the knowledge gaps that will be necessary for effective recovery plan development. Using a recovery outline where data is lacking, rather than trying to develop a recovery plan from the outset, can allow research and monitoring to commence more quickly—in turn allowing recovery planning to commence more quickly. With new data in hand, recovery plan development should be facilitated and plan development should proceed more quickly and smoothly. When possible, recovery efforts should be conducted throughout the recovery plan production process.
- In certain cases, other available documents (e.g., Marine Mammal Protection Act Conservation Plans) will contain relevant information and should be drawn upon in recovery planning efforts.
- Funding and staffing challenges: NOAA Fisheries should partner with academics, scientific societies, and other species experts for assistance with the research and analysis necessary to produce effective recovery plans. Such partnership accords with agency policy. See Interagency Cooperative Policy (“Outside expertise in the form of recovery teams, other Federal agencies, State agency personnel, Tribal governments, private conservation organizations, and private contractors shall be used, as necessary, to develop and implement recovery plans in a timely manner.”). Such partnerships can reduce the burden on agency personnel and inject needed expertise into the recovery planning process.
- Best available science: NOAA Fisheries should develop and implement a regulation requiring the use of the best available science for recovery planning. While NOAA leadership dismissed the need for a best available science mandate during the panel review process, there exist situations where the best available science has been ignored in recovery planning efforts. Institutionalizing a best available science requirement would ensure plans are grounded in solid science and further recovery planning efforts. It would also increase public confidence in the agencies’ recovery planning process. Such a regulation would accord with stated agency policy. See, e.g., U.S. Fish & Wildlife Serv. & Nat’l Oceanic & Atmospheric Admin., Endangered and Threatened Wildlife and Plants: Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities, 59 Fed. Reg. 34,270 (July 1, 1994) [hereinafter “Peer Review Policy”] (“The Act requires the Services to make biological decisions based upon the best scientific and commercial data available. These decisions involve ... recovery planning and implementation.”); Interagency Cooperative Policy (“each plan will seek the best information to fulfill the intent of the Act regarding recovery planning”).
- Jurisdictional issues: Involve all agencies early in the recovery planning process, and have the agencies develop a joint vision on an approach toward recovery. Agencies

³ See, e.g., *Bldg. Indus. Ass’n of Super. Cal. v. Norton*, 247F.3d 1241, 1246 (D.C. Cir. 2001) (agencies are to use “the ‘best scientific ... data available,’ not the best scientific data possible”).

should capitalize on the strengths of joint jurisdiction (e.g., more extensive expertise, the ability to encourage each other to act).

- Lag time between listing and recovery plan: Producing a recovery plan within the 2.5-year guideline established in the Interagency Cooperative Policy can enable much-needed recovery actions to begin, even for data-poor species. Having a functioning plan will facilitate plan revisions as more information becomes available. It will also avoid recovery teams having to continually recreate the wheel during an extended recovery planning process as new information comes online.
- Recovery team size: There appears to be a sweet spot in terms of recovery team size. While there is no “magic number,” teams that are too big proved cumbersome. To be well-functioning, a recovery team should have stable membership, the requisite breadth of expertise (including social science, research/field-based science, and management),⁴ and include both internal (agency) and external members. External stakeholders should be included in a strategic way—which may or may not involve a seat on the recovery team itself. For stakeholders not on the recovery team, a robust public comment process can afford an opportunity for them to provide input that will be considered in the recovery planning process. See 16 U.S.C. § 1533(f)(4) (“The Secretary shall, prior to final approval of a new or revised recovery plan, provide public notice and an opportunity for public review and comment on such plan. The Secretary shall consider all information presented during the public comment period prior to approval of the plan.”); 16 U.S.C. § 1533(f)(5) (“Each Federal agency shall, prior to implementation of a new or revised recovery plan, consider all information presented during the public comment period under paragraph (4).”).
- External peer review: NOAA Fisheries should craft an agency policy (beyond the peer review policy)⁵ to outline when independent, external peer review will be used in

⁴ According to the Interagency Cooperative Policy, recovery “[t]eam members should be selected for their knowledge of the species or for expertise in elements of recovery plan design or implementation (such as local planning, rural sociology, economics, forestry, etc.), rather than for their professional or other affiliations. Teams are to be composed of recognized experts in their fields and are encouraged to explore all avenues in arriving at solutions necessary to recover threatened or endangered species. Factors for selection of team members are (1) expertise (including current involvement, if possible), with respect to the species, closely related species, or the ecosystem in which it is or may once again become a part, (2) special knowledge of one or more threats contributing to the listed status of the species and (3) knowledge of one or more related disciplines, such as land use planning, state regulations, etc. The Services also will select team members based on special knowledge essential for the development of recovery implementation schedules, particularly development of Participation Plans that are intended to minimize the social and economic effects of recovery actions. Teams should include representatives of State, Tribal, or Federal agencies, academic institutions, private individuals and organizations, commercial enterprises, and other constituencies with an interest in the species and its recovery or the economic or social impacts of recovery” (emphasis added).

⁵ NOAA’s Peer Review Policy provides that “[i]ndependent peer review will be solicited on ... draft recovery plans to ensure the best biological and commercial information is being used in the decisionmaking process, as well as to ensure that reviews by recognized experts are incorporated into the review process of ... recovery plans developed in accordance with the requirements of the Act.” See also id. (“it is the policy of the Services to incorporate independent peer review in ... recovery activities, during the public comment period, in the following manner: (a) Utilize the expertise of and actively solicit independent peer review to obtain all available scientific and commercial information ...; (b) Document and use, where appropriate, independent peer review to review pertinent scientific data relating to the selection or implementation of specialized recovery tasks or similar topics in draft or approved recovery plans for listed species; (c) Summarize in the final recovery plan the opinions of all independent peer

recovery planning. While internal peer review serves an important role, external peer reviewers can provide unique expertise, ensuring plan effectiveness and promoting scientific integrity and public trust in the recovery plan and planning process. Ideally, external peer review would be part of every recovery planning process.

- Perceptions of recovery planning success: While one measure of the success of recovery plans/recovery planning is removing species from the list of threatened and endangered species, another is considering whether species are moving in the right direction (i.e., whether trajectories have stabilized or are increasing). In the recovery plan, NOAA Fisheries should identify interim milestones along the road to recovery to demonstrate incremental progress.

Question 3: How effective are the final recovery plans?

Observations:

Strengths:

- Many listed species' populations—especially those that have been had a plan for at least a decade—have stabilized or are increasing. This is a sign of plan success.
- Final recovery plans tend to be more effective when (1) the agency has linked recovery actions to recovery criteria (biological criteria or threats-based criteria), and (2) action items have been prioritized to guide implementation team members.⁶ Threats assessment can be extremely useful for helping to determine which recovery actions should take priority, and for linking recovery actions to recovery criteria and threats.
- Some recovery teams have taken a precautionary approach to recovery planning to help protect against uncertainty (e.g., climate change impacts). This makes the plans more nimble in the face of a changing environment and more effective for a longer period of time.
- Active implementation teams help ensure recovery plan effectiveness.
- First iterations of recovery plans provide useful templates for revisions.
- Recovery plans create a framework for monitoring recovery.
- Recovery plans are generally available to the public and searchable.

Challenges:

- Recovery plans often serve as a good basis for guiding research, but not necessarily for management.
- There is a perceived need to balance recovery goals with “real-world expectations.” Politics or perceived feasibility can trump science in setting recovery objectives and actions. See, e.g., MAFAC Analysis, at 9 (“Hawaii has focused on education and outreach with fishermen, emphasizing the use of barbless circles as preferred gear.

reviewers asked to respond on an issue and include the reports and opinions in the administrative record of that plan.”).

⁶ Recovery actions are prioritized in compliance with NMFS' Endangered and Threatened Species Listing and Recovery Priority Guidelines (55 FR 24296) as follows: Priority 1: Actions that must be taken to prevent extinction or to prevent the species from declining irreversibly; Priority 2: Actions that must be taken to prevent a significant decline in species population/habitat quality or in some other significant negative impact short of extinction; Priority 3: All other actions necessary to provide for full recovery of the species.

However, substantially reducing or eliminating the fishing interactions in the first place would be a more direct way to support recovery.”).

- The ESA requires that recovery plans contain objective, measurable recovery criteria and site-specific management actions. See 16 U.S.C. § 1533(f)(1). However, developing objective, measurable, and appropriate recovery criteria has proved challenging, especially for data-limited species. Further, site-specific recovery actions are often lacking in recovery plans, especially for data limited species. Even where present, “site-specific” criteria may be relatively generic—e.g., terrestrial vs. in-water rather than geographically based.
- Recovery actions may not be tied to specific recovery criteria.
- Linking biological responses to recovery actions can be difficult.
- For some species, status continues to decline even after a decade of recovery plan implementation (e.g., Chinook salmon).
- Implementation of plans for transboundary species is often challenging, with the result being that plans are less effective than they could be. Relatedly, coordination with foreign governments can complicate or frustrate U.S. recovery efforts.
- Recovery plans may be out-of-date, and thus less effective than they could be in recovering species.
- Cost estimates⁷ are challenging to develop, especially for as-yet untested recovery actions.

Recommendations to address issue:

- Research/action balance: There needs to be a better balance between research and management/action in recovery plans. Research is necessary but not sufficient for recovery. However, research is non-controversial and thus easier to implement, while management actions may be controversial, political, and contested. However, to truly ensure species recovery, recovery plans must be grounded in action. See 16 U.S.C. § 1533(f)(1) (“in developing and implementing recovery plans, [the Secretary] shall, to the maximum extent practicable ... incorporate in each plan ... a description of such site-specific management actions as may be necessary to achieve the plan’s goal for the conservation and survival of the species.”) (emphasis added). To facilitate this balance and avoid skewing plan recommendations toward research, recovery teams should include a balance of managers and scientists.
- “Real-world feasibility:” Recovery plans should set out exactly what needs to be done if we wish to truly recover a species. Politics and perceived “real-world feasibility” should not dictate plan contents. If an objective or action is truly impossible (e.g., because a certain percentage of habitat has been destroyed and is not restorable), that should be expressly acknowledged and effective alternatives developed. If effective alternatives are not available, then the species may be “conservation-reliant” and need continuing protection under the ESA. See also Defenders of Wildlife Comments at 5 (“it is clear that recovery cannot be conditioned on factors other than the need to ensure long-term persistence (or conservation) of the species”).

⁷ See 16 U.S.C. § 1533(f)(1) (“[I]n developing and implementing recovery plans, [the Secretary] shall, to the maximum extent practicable ... (B) incorporate in each plan ... (iii) estimates of the time required and the cost to carry out those measures needed to achieve the plan’s goal and to achieve intermediate steps toward that goal.”).

- Developing objective, measurable recovery criteria and site-specific management actions must be a priority of every recovery planning process. These criteria and management actions must be presented with the level of specificity needed to make them useful for species recovery.
 - Where such information is unavailable, recovery outlines can be used as an interim step to help obtain the information required to draft a complete recovery plan. Five-year reviews and plan revisions can supplement recovery efforts with the best available scientific information and management knowledge.
 - Recovery plans should be tiered such that recovery actions are linked to objective and measurable recovery criteria, which in turn are linked to threats. Threats assessment (quantitative or qualitative) can be used to this effect. This tool clearly presents key threats to the species⁸ and thus can help prioritize recovery actions. In addition, once done for multiple species, it is possible to analyze where threats may concentrate in a given ecosystem. This can make ecosystem-based approaches to species recovery more tractable.

Question 4: How effective is NOAA Fisheries at monitoring and implementing recovery?

Observations: Given that recovery plan implementation is discretionary, NOAA Fisheries does a commendable job in following through on its stated commitments.

Strengths:

- Protections outlined in biological opinions (produced under ESA § 7, 16 U.S.C. § 1536) can be incorporated into recovery plans, facilitating the recovery planning process. Further, these provides can provide a lever for enforcement of certain needed recovery actions.
- On-the-ground recovery teams/field staff are committed and competent. Where funding and staffing allow, recovery actions may comprise the day-to-day work of the Office of Protected Resources and regional offices (e.g., loggerhead sea turtle).
- Recovery implementation teams have proven helpful in successfully implementing recovery plans.
- Monitoring plans have been developed and successfully implemented, leading to increased knowledge on species ecology and threats.
- Recovery plan implementation serves an education and outreach function, and often results in increased awareness and community engagement in species recovery.
- International partners and agreements can be instrumental in effecting recovery.

Challenges:

- Funding and staffing shortages can prevent full implementation of recovery plans.

⁸ See 16 U.S.C. § 1533(a)(1) (“The Secretary shall ... determine whether any species is an endangered species of a threatened species because of any of the following factors: (A) the present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanism; or (E) other natural or manmade factors affecting its continued existence.”).

- NOAA Fisheries does not take full advantage of opportunities to partner with academics, scientific societies and non-governmental organizations (“NGOs”), all of which could further recovery efforts.
- It is important to highlight milestones along the way to recovery to show progress, prior to actual delisting. This does not always occur.
- A lack of defined, quantitative recovery criteria hinders recovery action.
- Uncertainty and lack of data complicate recovery efforts.
- Assessing the effectiveness of recovery actions is not straightforward.
- Transboundary challenges complicate recovery implementation. Reliance on international partners and agreements to effect recovery limits the utility of recovery plans—though recovery plans can be drafted in a way that complements these other efforts.
- Implementation teams are not always developed and deployed.

Recommendations to address issue:

- To help compensate for funding and staffing shortfalls, NOAA Fisheries should capitalize on opportunities to partner with academics, scientific societies, and NGOs. These partnerships can occur in concert with recovery planning (e.g., serving on recovery teams), and also in terms of monitoring and recovery.
- NOAA Fisheries should reframe the way it talks about “recovery” with stakeholders and the general public to emphasize that species recovery does not necessarily and solely mean removing a species from the ESA list. Rather, it can mean stabilizing a population or reversing a declining trend. Interim mileposts on the road to recovery should be identified and celebrated when reached.
- Using five-year reviews and other plan revision opportunities can afford NOAA Fisheries the opportunity to adapt and respond to new data or information, refine recovery criteria and recovery actions, and ultimately further species recovery.
- NOAA Fisheries could better capitalize on the synergies between recovery and regulation. For example, incorporating information contained in Biological Opinions produced under Section 7 of the ESA into a recovery plan can ensure consideration and use of the best available science and reduce the need for a recovery team to develop background and baseline information from scratch. Recovery teams can thus focus their efforts on thinking about what will drive species recovery (rather than avoid jeopardy).

Conclusions

NOAA Fisheries faces myriad challenges in recovering threatened and endangered species. Despite these challenges, the agency has done a commendable job in using its authority under the ESA to prevent species extinction and begin recovering listed species. At the same time, there is room for improvement. This summary report provides numerous recommendations on how the recovery planning process might be improved. Following are some highlights:

- NOAA Fisheries should not discount historical range when determining (1) whether a species should receive a recovery plan, and (2) where recovery efforts should focus.

- NOAA Fisheries should develop and implement a regulation requiring the use of the best available science for recovery planning.
- NOAA Fisheries should craft an agency policy that clearly outlines when independent, external peer review will be used in recovery planning.
- Objective, measurable recovery criteria and site-specific management actions must be included in every recovery plan. Tools including threats assessment effectively link management actions to recovery criteria, which in turn are linked to threats.
- Recovery plans must balance research needs with recovery actions. To facilitate this balance, recovery teams should include a balance of managers and scientists.
- Recovery plans should set out exactly what needs to be done to truly recover a species, regardless of politics and perceived “real-world feasibility.”
- NOAA Fisheries should capitalize on opportunities to partner with academics, scientific societies, and NGOs in both recovery plan development and monitoring and implementation efforts.

I appreciate NOAA Fisheries convening this panel, which provided an opportunity for agency staff, panelists, and the public to begin a dialogue about how to improve the recovery planning process. I look forward to seeing how NOAA Fisheries utilizes the information provided during this review process to improve recovery efforts for our nation’s threatened and endangered species, and, ultimately, to celebrating the recovery of species under the agency’s care.