



NOAA FISHERIES

**National Marine Fisheries Service
Habitat Enterprise Fish Passage Program Review**

**Final Synthesis Report
Prepared July 23, 2018
By the Consensus Building Institute**



Table of Contents

Executive Summary	4
<i>Introduction</i>	4
<i>Review Process</i>	4
<i>Panel Findings and Recommendations</i>	5
<i>NOAA Fisheries Review and Next Steps</i>	7
Introduction	8
Review Process Overview	8
<i>Context and Mandate</i>	8
<i>The Review Panel</i>	9
<i>The Review Process</i>	9
<i>Panel Report Drafting Process</i>	11
<i>NOAA Fisheries Review and Next Steps</i>	11
Review Panel Workshop	12
<i>Workshop Background Presentations</i>	12
<i>Public Comments</i>	14
<i>Wrap-up and Next Steps</i>	15
Panelist Report Synthesis	16
<i>Overarching Themes</i>	16
<i>Review Question Synthesis</i>	18
Strengths & Challenges Towards Achieving Overall Program Goal	18
Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	19
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	19
Panelists’ Recommendations	20
Integration of Hydropower Requirements and Timelines with Voluntary Habitat Restoration Opportunities	21
Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	21
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	22
Panelists’ Recommendations	22
Incorporation of a Watershed Approach into High Priority Habitat Restoration	23
Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	23
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	23
Panelists’ Recommendations	24
Coordination Between Hydropower and Community-based Restoration Projects	25
Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	25
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	26
Panelists’ Recommendations	26
Evaluation of Agency-wide Fish Passage Program Outcomes	28
Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	28
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	28
Panelists’ Recommendations	28
Balancing Between Implementation and Monitoring & Evaluation	30

Panelists’ Observations – Strengths of NOAA Fisheries’ Approach	30
Panelists’ Observations – Challenges of NOAA Fisheries’ Approach	30
Panelists’ Recommendations	31
Enhancing Outreach and Communications	32
Observations – Strengths of NOAA Fisheries’ Approach	32
Observations – Challenges of NOAA Fisheries’ Approach	33
Recommendations.....	33
Appendix A – Panelist Reports	36

Executive Summary

Introduction

On May 21-24, 2018, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) Office of Habitat Conservation (OHC) convened an independent panel in Silver Spring, Maryland, to review its two programs that implement fish passage: the Community-based Restoration Program (CRP) and the Hydropower Program. This report provides a summary of the process, as well as panelists' findings and recommendations.

The purpose of this review was to obtain external input into the fish passage programs – areas of strength as well as potential areas to implement changes to improve upon program successes in increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species. The review covered the fish passage program's mission/goal, prioritization, coordination, effectiveness, and external engagement.

NOAA Fisheries programs included within this review are the Restoration Center's Community-based Restoration Program, which provides technical and financial assistance for dam removals and other fish passage projects; and the Hydropower Program, which is coordinated by OHC's Habitat Protection Division and is executed by NOAA Fisheries Regional Offices through review of and comment on hydropower projects licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act.

Review Process

NOAA Fisheries' Office of Habitat Conservation convened an eight-member review panel to evaluate its two programs that implement fish passage: the Community-based Restoration Program and the Hydropower Program. The review panelists were:

- John Ferguson, Ph.D., Principal Fisheries Scientist, Anchor QEA, Seattle, WA
- Stephen Gephard, Supervising Fisheries Biologist, Connecticut Department of Energy and Environmental Protection Fisheries Division
- Adrian Jordaan, Ph.D., Assistant Professor of Fish Population Ecology and Conservation, University of Massachusetts Amherst
- Serena McClain, Director of River Restoration, American Rivers
- Steve Parker, Technical Services Coordinator, Yakama Nation
- Jeremy Pratt, Vice President and Hydro Market Director, TRC
- John Rothlisberger, Ph.D., National Program Leader for Fish and Aquatic Ecology Research, U.S. Forest Service Research & Development, Washington, DC
- Marcin Whitman, Senior Hydraulic Engineer, California Department of Fish and Wildlife

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

Mission/Goal

- In the Habitat Enterprise strategic plan, our goal is to, “conserve habitat for managed fisheries and protected resources,” and one of the strategies for achieving this goal is expanding available habitat type by “increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species.” Where do you see us excelling in achieving this goal? What kinds of things could we be doing or doing more of to help us achieve this goal?

Prioritization

- How do we better integrate Hydropower regulatory requirements and timelines with voluntary habitat restoration opportunities into a strategy for addressing highest priority barriers?
- How do we better incorporate a “watershed” approach into high priority fish passage habitat restoration?

Coordination

- How can we better coordinate our Hydropower and Community-based Restoration projects to build momentum within a watershed to open and create more opportunities for accessible habitat?

Evaluating Fish Passage Effectiveness

- How can we improve our strategy and structure for evaluating agency-wide fish passage program outcomes?
- Within our program activities, what is the most effective balance for investing in implementation and monitoring and evaluation?

Engagement

- What are steps we can take to improve our outreach to ensure we are effectively communicating the importance of fish passage?

NOAA Fisheries program and scientific staff presented substantive material and multiple case studies from each of the regions that provided information designed to help panelists consider the seven 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.

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 framing questions:

In the Habitat Enterprise strategic plan, our goal is to, “conserve habitat for managed fisheries and protected resources,” and one of the strategies for achieving this goal is

expanding available habitat type by “increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species.”

- *Where do you see us excelling in achieving this goal?*
- *What kinds of things could we be doing or doing more of to help us achieve this goal?*

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.

- Fish passage programs staff and leadership are uniformly seen as key program assets, given their skills, expertise, and commitment to the program. Several panelists noted, in particular, staff members’ ability and innovations implemented to juggle a large scope of work with limited resources. Panel reports included recommendations that the agency consider additional efforts to support staff, including support for education and training internally, details and exchanges, long-term succession planning, and support for university programs focused on producing fish passage engineers and biologists.
- In general, the fish passage programs are seen as effective in terms of their approach, effort invested, and achievements around fish passage. In particular, panelists lauded strong program design, management, and execution. Various panelists also observed the impressive results that the fish passage programs have achieved in terms of miles of habitat accessed and stream miles opened, numbers of projects, groups empowered to complete fish passage projects, and innovative approaches pioneered.
- While panelists expressed broad support for the current mission and goals of the fish passage programs, many urged NOAA Fisheries to adopt a more concrete and ambitious program objective (the current objective reads “by 2020, increase access to historic river rearing and spawning habitat for targeted diadromous fish species”) that establishes a numerical target. Panelists also urged NOAA Fisheries to think deeply about its future aspirations and future vision for fish passage.
- Along with a more clearly defined program objective and overall goals, panelists also encouraged the development of additional performance metrics for both the Community-based Restoration Program and the Hydropower Program and, in some cases, provided specific suggested metrics. Panelists also noted that current program goals and reporting metrics may have little connection with the biological condition of target resources and suggested that high-level goals and reporting metrics intended for use by HQ should be supplemented with science-based goals and reporting metrics at the regional level. Some panelists also stressed the importance of adopting SMART goals (i.e. goals that are **s**pecific, **m**easurable, **a**chievable, **r**elevant, and **t**ime-bound) and the associated implementation of adaptive management principles.
- Panelists also provided input on the fish passage program’s work to prioritize efforts. While a number of panelists identified an opportunity to enhance prioritization (one

panelist, for example, suggested considering creation of a watershed restoration “framework,” whether a recovery plan, biologic strategy, or general watershed plan), they also stressed the importance of continuing to balance strategic effort with opportunistic flexibility. One panelist, however, stated that no further ranking is needed (at least in the Northeast) and instead called for ground-truthing priorities by local people who know the watersheds and towns.

- Panelists commented widely on the need to strengthen internal coordination both within the fish passage programs and within NOAA Fisheries more broadly. While panelists generally observed significant strength in allowing and empowering each Region to address and resolve its unique issues and challenges, they also identified opportunities for headquarters to learn more about work occurring in the field and, in some cases, to provide additional guidance to regions. Broadly speaking, many panelists also called for greater coordination among the hydropower and CRP programs in the regions, headquarters staff, the Protected Resources Division (PRD), and the Fisheries Science Centers (one reviewer suggested the formation of a national fish passage working group). Panelists cited several advantages to enhanced coordination, such as making greater use of legal authorities, strengthening prioritization efforts, and enhancing stakeholder engagement efforts.
- Across the board, panelists encouraged ongoing efforts to enhance relationships and collaboration with external stakeholders. In particular, panelists highlighted the importance of continuing to work with (and in some cases, such as Indian tribes, placing much greater emphasis on cultivating relationships with) federal agencies (particularly USFWS and FERC), state agencies, Indian tribes, and NGOs. Given NOAA Fisheries’ limited resources and authorities, panelists identified partnerships as being critical for ongoing effectiveness of the agency’s efforts.

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, the Office of Habitat Conservation is to prepare a brief response to the summary report within approximately one month after receipt of the report package.

All documents – (a) facilitator’s summary of the program review proceedings (e.g., process overview, salient issues, public comments, and recurring themes across individual panelist reports, etc.); (b) individual panelist reports; and (c) Director’s response, to the individual panelist reports – will be posted on the Office of Habitat Conservation website. Authorship of the individual panelist reports will remain anonymous to the public.

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

Introduction

On May 21-24, 2018, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) convened an independent panel in Silver Spring, Maryland, to review the agency's two programs that implement fish passage: the Community-based Restoration Program and the Hydropower Program. This report provides a summary of the process, as well as panelists' findings and recommendations.

Review Process Overview

Context and Mandate

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) is responsible for the stewardship of the nation's ocean resources and their habitat. Fish passage is important for the protection and restoration of diadromous fish and their habitats. Dams and other barriers fragment a river system, impede or block fish movement, to spawning, rearing and migratory habitats. The sustainability of fish species populations that would otherwise move to and from different habitats within the river system may diminish substantially, if not completely, due to dams and other barriers. For this reason, NOAA works to maintain unimpeded access to habitat where barriers do not yet exist, open access to habitat where fish are prevented from passing, and ensure that the passage for fish is safe, timely, and effective.

Through authority granted by legislation, including the [Federal Power Act \(FPA\)](#), the [Magnuson-Stevens Fishery Conservation and Management Act \(MSA\)](#), [Endangered Species Act \(ESA\)](#), and the [Fish and Wildlife Coordination Act \(FWCA\)](#), NOAA Fisheries applies multiple strategies to conserve, protect and restore fish and their habitats, and ensure safe and effective fish passage.

This review was coordinated by the Office of Habitat Conservation (OHC), with support from the Habitat Enterprise¹. For the purpose of this review, the NOAA Fisheries fish passage program consists of activities managed by various national and regional offices within NOAA Fisheries whose purpose is to maintain or improve access for migrating fish that need to reach riverine habitats for various life stages.

NOAA programs included within this review are the Restoration Center's Community-based Restoration Program, which provides technical and financial assistance for dam removals and other fish passage projects; and the Hydropower Program, which is coordinated by OHC's Habitat Protection Division and is executed by the NMFS Regional Offices through review of and comment on FERC licenses under the Federal Power Act.

¹ The Habitat Enterprise includes the Office of Habitat Conservation, the Assistant Regional Administrators for Habitat Conservation and their staff, and habitat management-related components for the West Coast Region and their staff.

Following similar review processes undertaken by NOAA’s Fisheries Science Centers and the agency’s Endangered Species Recovery Program, NOAA Fisheries initiated the first review of its programs supporting fish passage. The purpose of this review was to obtain external input into the fish passage programs – areas of strength as well as potential areas to implement changes to improve upon program successes in increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species. The review covered the fish passage program’s mission/goal, prioritization, coordination, effectiveness, and external engagement.

The Review Panel

NOAA Fisheries’ Office of Habitat Conservation convened an eight-member review panel to evaluate its two fish passage programs: the Community-Based Restoration Program and the Hydropower Program. These eight panelists used information provided to them by OHC, their own professional expertise, and their discussions to provide advice on how to improve NOAA Fisheries’ fish passage programs.

The program review panel included professionals with familiarity of fish passage and its role in supporting ecosystem services, and relevant statutory authorities under which NOAA Fisheries operates (e.g., Federal Power Act, Magnuson-Stevens Act, Endangered Species Act, Fish and Wildlife Coordination Act). The panel included both national and regional perspectives in regard to fish passage, being able to discern the differences faced on the East, Gulf and West Coasts. The review panelists were:

- John Ferguson, Ph.D., Principal Fisheries Scientist, Anchor QEA, Seattle, WA
- Stephen Gephard, Supervising Fisheries Biologist, Connecticut Department of Energy and Environmental Protection Fisheries Division
- Adrian Jordaan, Ph.D., Assistant Professor of Fish Population Ecology and Conservation, University of Massachusetts Amherst
- Serena McClain, Director of River Restoration, American Rivers
- Steve Parker, Technical Services Coordinator, Yakama Nation
- Jeremy Pratt, Vice President and Hydro Market Director, TRC
- John Rothlisberger, Ph.D., National Program Leader for Fish and Aquatic Ecology Research, U.S. Forest Service Research & Development, Washington, DC
- Marcin Whitman, Senior Hydraulic Engineer, California Department of Fish and Wildlife

Biographies for all panelists are on the [NOAA Fisheries 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 fish passage programs, panelists considered applicable statutes and agency policies, guidance, practices related to fish passage, and their own professional experience.

Multi-day, in-person review process. A key aspect of the review process was a four-day meeting held in Silver Spring, Maryland. (The meeting agenda is available on the [NOAA Fisheries website](#).) The meeting was organized around the following questions:

Mission/Goal

- In the Habitat Enterprise strategic plan, our goal is to, “conserve habitat for managed fisheries and protected resources,” and one of the strategies for achieving this goal is expanding available habitat type by “increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species.” Where do you see us excelling in achieving this goal? What kinds of things could we be doing or doing more of to help us achieve this goal?

Prioritization

- How do we better integrate Hydropower regulatory requirements and timelines with voluntary habitat restoration opportunities into a strategy for addressing highest priority barriers?
- How do we better incorporate a “watershed” approach into high priority fish passage habitat restoration?

Coordination

- How can we better coordinate our Hydropower and Community-based Restoration projects to build momentum within a watershed to open and create more opportunities for accessible habitat?

Evaluating Fish Passage Effectiveness

- How can we improve our strategy and structure for evaluating agency-wide fish passage program outcomes?
- Within our program activities, what is the most effective balance for investing in implementation and monitoring and evaluation?

Engagement

- What are steps we can take to improve our outreach to ensure we are effectively communicating the importance of fish passage?

NOAA Fisheries program and scientific staff presented substantive material and multiple case studies from four regions to help panelists consider the seven organizing 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 75 individuals (representing a mix of federal and state agencies, NGOs, hydropower and utility industry representative, and others) attended the meeting or participated via teleconference and webinar (not including panelists, facilitators, or NOAA Fisheries staff who delivered presentations).

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 three pre-review process teleconferences and informal input. The Terms of Reference for the program review is available on the [NOAA Fisheries 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 fish passage programs. Each panelist made findings and recommendations on the core program review framing questions:

In the Habitat Enterprise strategic plan, our goal is to, “conserve habitat for managed fisheries and protected resources,” and one of the strategies for achieving this goal is expanding available habitat type by “increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species.”

- *Where do you see us excelling in achieving this goal?*
- *What kinds of things could we be doing or doing more of to help us achieve this goal?*

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 OHC, the Director of the Office of Habitat Conservation will prepare a response to the summary report within approximately a month after receipt of the report package.

All documents – (a) facilitator’s summary of the program review proceedings (e.g., process overview, salient issues, public comments, and recurring themes across individual panelist reports, etc.); (b) individual panelist reports; and (c) Director’s response, to the individual panelist reports – will be posted on the Office of Habitat Conservation website. Authorship of the individual panelist reports will remain anonymous and OHC is not accepting public comment on these panelist reports. 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 Katherine Sheppard with NOAA's Fisheries Office of Habitat Conservation (see contact information on the [NOAA Fisheries website](#)).

Review Panel Workshop

The bulk of the workshop centered on the seven 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; an opportunity for panelists to provide preliminary reflections; and closed, panelist-only working sessions at the end of each 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 OHC leadership to answer panelists’ outstanding questions.

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 all attendees of the first day of the meeting (individuals joining on subsequent days were also invited to introduce themselves).

Fish Passage Programs and Review Process. Carrie Selberg with NOAA Fisheries OHC provided an overview of the two fish passage programs included in the review and of the review process. Her presentation provided background on the following elements: overview of the Habitat Enterprise and what it does, the importance of fish passage work to the agency’s mission, and overviews of the Hydropower and Community-based Restoration Programs.

Regional Context. The Hydropower and Community-based Restoration Programs from each Region (Northeast, Southeast, West Coast, Alaska) and Headquarters shared high-level overviews of what fish passage looks like from their perspective. This included the characteristics that make each region distinct, explanations of the current state of fish passage work in each region, key species each regional fish passage program focuses on, key

accomplishments, regional fish passage challenges, and areas of likely focus for each region over the next 5-10 years given those challenges and opportunities.

Program Review Queries. A series of context-setting presentations and focused case studies were presented to support the panel’s discussions on the review questions. The cases were chosen to provide information about the questions posed to the panelists. Each presentation included time for panelists to pose questions and engage in discussion with case presenters. Below is a list of the presentations delivered. (More detailed aspects to consider related to each question can also be found in the Terms of Reference, also available on the [NOAA Fisheries website](#).) In addition to the presentations and accompanying question and answer sessions, the Partnership and Engagement session featured a facilitated open discussion with the panel, other partners, and members of the public in attendance.

Prioritization	Prioritization Introduction <i>(Kara Meckley)</i>		
	<i>Prioritization Case Studies:</i>		
	CRP Greater Atlantic Region Fish Passage Prioritization <i>(Matt Collins)</i>	CRP Partner-led prioritization <i>(Leah Mahan)</i>	Puget Sound CRP Prioritization <i>(Jason Lehto)</i>
	Southeast Regional Office Hydropower Prioritization <i>(Pace Wilber)</i>	West Coast Region Hydropower Prioritization <i>(Steve Edmondson)</i>	

Watershed Approach	Hydropower High-level Overview of Watershed Approach <i>(Bjorn Lake)</i>		
	<i>Hydropower Watershed Case Studies:</i>		
	Klamath <i>(Steve Edmondson)</i>	Yuba <i>(Steve Edmondson)</i>	Santee <i>(Fritz Rohde)</i>
	CRP High-level Overview of Watershed Approach <i>(Melanie Gange)</i>		
	<i>CRP Watershed Case Study:</i>		
	Community-based Restoration Program Watershed Approaches <i>(Mary Andrews)</i>		

Coordination	Coordination overview <i>(Melanie Harris and Leah Mahan)</i>		
	<i>Coordination Case Studies:</i>		
	Greater Atlantic Regional Fisheries Office (GARFO) CRP/Hydropower Diadromous Fish Planning Guidance and Watershed Teams <i>(Sean McDermott and John Catena)</i>	Cape Fear River <i>(Pace Wilber and Howard Schnabolk)</i>	Upper Eel River <i>(Steve Edmondson and Leah Mahan)</i>

Evaluating Fish Passage Effectiveness	Hydropower Effectiveness Monitoring (Alex Atkinson)		
	Community-based Restoration Program (CRP) Implementation and Effectiveness Monitoring (Tisa Shostik)		
	<i>Monitoring Case Studies:</i>		
	Penobscot (Sean McDermott)	Patapsco and Merrimack Village Dam monitoring (Matt Collins)	Pacific NW (Keith Kirkendall)
	CRP California Recolonization Monitoring (Leah Mahan)	Battle Creek Diversion (Sue Walker)	Roanoke Rapids (Fritz Rohde)

Engagement	<i>Partnership and Engagement Presentations:</i>		
	National Partnership Engagement (Alison Hammer)	CRP approach to Stakeholder Engagement (Leah Mahan)	Hydropower Program Stakeholder Engagement (Keith Kirkendall)

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.²

Development of Goals, Objectives, and Strategies

- It would be beneficial for NOAA Fisheries to define more explicit goals, objectives, and strategies at the regional and national scales to guide program implementation.

Prioritization

- NOAA Fisheries is uniquely capable of clearly communicating science-based habitat conservation (restoration and protection) priorities to provide regions with a consistent foundation and frame for their prioritization efforts.

Partnerships and Stakeholder Engagement

- It would be helpful for the Community-based Restoration Programs to clearly define for partners what it considers to be a “watershed approach.” Partners may have distinct conceptions of what a watershed approach entails, and so clarity from CRP on its approach would be useful.
- To enhance the Community-based Restoration Program’s outreach and stakeholder engagement efforts, it may be useful for CRP to formally request feedback from partners, stakeholders, and grantees about how CRP outreach could be improved (for example, a survey or needs assessment). This would help CRP identify specific partner

² Please note that this section only includes comments on each of these topics that were provided by members of the public. Additional content on each of these themes from panelists is included in the Panelist Report Synthesis section, beginning on page 17.

and stakeholder needs and wants for outreach and engagement and would be helpful for designing useful tools and approaches in the future.

- Partnerships with diverse stakeholder groups are essential to developing projects that meet the goals of the human residents of watersheds, including clean water, recreation, flood risk reduction and support the long-term investments in many types of projects to support healthy fish populations. NOAA Fisheries should develop intentional, and sustained, engagement with stakeholders as a model throughout programs.
- Coordinating communication to Capitol Hill is critically important and NOAA Fisheries can and should work with external partners to strengthen this outreach.

Interim Approaches for Fish Passage

- Given the length of time needed to address fish passage at any given site, NOAA should more strongly consider enabling innovative temporary solutions so the fish can begin recovery before the watershed and funding plans are in place.

Wrap-up and Next Steps

CBI facilitator Bennett Brooks reviewed key themes based on the panel's deliberations during the public sessions. He noted the panel-only session to be held Thursday, May 24, in order to give panelists a chance to reflect on the presentations and begin drafting individual reports.

The next steps noted by CBI facilitator Bennet Brooks include:

- Within two weeks, panelists provide their final individual reports to CBI.
- CBI produces a draft Synthesis Recovery Program Review Report for review and comment by OHC staff and by panelists. CBI finalizes the report based on OHC and panelist comments and submits a final report to NOAA Fisheries in late July.
- NOAA Fisheries drafts its response to panelist findings and recommendations
- Final reports and Agency response are expected to be posted publically around late August.

For questions or comments regarding this report, please contact Katherine Sheppard (katherine.sheppard@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 eight panelist reports to provide a synthesis of key themes and takeaways. It is organized as follows:

- 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) **Review 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.

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 fish passage programs.

All panelists were provided an opportunity to review and comment on an early draft of CBI's synthesis to ensure it is a comprehensive and accurate compilation of the individual reports. This report reflects their feedback and recommended revisions.

Overarching Themes

A review of the panelist reports suggests a number 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.

- Fish passage programs staff and leadership are uniformly seen as key program assets, given their skills and expertise and commitment to the program. Several panelists noted, in particular, staff members' ability and innovations implemented to juggle a large scope of work with limited resources. Panel reports included recommendations that the agency consider additional efforts to support staff, including support for education and training internally, details and exchanges, long-term succession planning, and support for university programs focused on producing fish passage engineers and biologists.
- In general, the fish passage programs are seen as effective in terms of their approach, effort invested, and achievements around fish passage. In particular, panelists lauded

strong program design, management, and execution. Various panelists also observed the impressive results that the fish passage programs have achieved in terms of miles of habitat accessed and stream miles opened, numbers of projects, groups empowered to complete fish passage projects, and innovative approaches pioneered.

- While panelists expressed broad support for the current mission and goals of the fish passage programs, many urged NOAA Fisheries to adopt a more concrete and ambitious program objective (the current objective reads “by 2020, increase access to historic river rearing and spawning habitat for targeted diadromous fish species”) that establishes a numerical target. Panelists also urged NOAA Fisheries to think deeply about its future aspirations and future vision for fish passage.
- Along with a more clearly defined program objective and overall goals, panelists also encouraged the development of additional performance metrics for both the Community-based Restoration Program and the Hydropower Program and, in some cases, provided specific suggested metrics. Panelists also noted that current program goals and reporting metrics may have little connection with the biological condition of target resources and suggested that high-level goals and reporting metrics intended for use by HQ should be supplemented with science-based goals and reporting metrics at the regional level. Some panelists also stressed the importance of adopting SMART goals (i.e. goals that are **s**pecific, **m**easurable, **a**chievable, **r**elevant, and **t**ime-bound) and the associated implementation of adaptive management principles.
- Panelists also provided input on the fish passage program’s work to prioritize efforts. While a number of panelists identified an opportunity to enhance prioritization (one panelist, for example, suggested considering creation of a watershed restoration “framework,” whether a recovery plan, biologic strategy, or general watershed plan), they also stressed the importance of continuing to balance strategic effort with opportunistic flexibility. One panelist, however, stated that no further ranking is needed (at least in the Northeast) and instead called for ground-truthing priorities by local people who know the watersheds and towns.
- Panelists commented widely on the need to strengthen internal coordination both within the fish passage programs and within NOAA Fisheries more broadly. While panelists generally observed significant strength in allowing and empowering each Region to address and resolve its unique issues and challenges, they also identified opportunities for headquarters to learn more about work occurring in the field and, in some cases, to provide additional guidance to regions. Broadly speaking, many panelists also called for greater coordination among the hydropower and CRP programs in the regions, headquarters staff, the Protected Resources Division, and the Fisheries Science Centers (one reviewer suggested the formation of a national fish passage working group). Panelists cited several advantages to enhanced coordination, such as making greater use of legal authorities, strengthening prioritization efforts, and enhancing stakeholder engagement efforts.

- Across the board, panelists encouraged ongoing efforts to enhance relationships and collaboration with external stakeholders. In particular, panelists highlighted the importance of continuing to work with (and in some cases, such as Indian tribes, placing much greater emphasis on cultivating relationships with) federal agencies (particularly USFWS and FERC), state agencies, Indian tribes, and NGOs. Given NOAA Fisheries' limited resources and authorities, panelists identified partnerships as being critical for ongoing effectiveness of the agency's efforts.

Finally, panelists broadly complimented NOAA Fisheries on its interest in undertaking an external program review and the strong organization of the review process. Panelists expressed appreciation for the strong presentations and opportunities in the schedule to ask questions and engage in discussion. At the same time, all panelists expressed frustration that presentations focused on success stories, which made it difficult to determine if the information that was shared was an accurate and comprehensive depiction of program effectiveness. For example, panelists expressed disappointment that NOAA Fisheries did not bring forward aspirational goals for the better integration of the CRP and hydropower programs and suggested that future program reviews be organized by an independent third party and include greater representation and engagement from the Protected Resources Division, NOAA Science Centers, FERC, and the hydropower industry. Finally, many panelists encouraged NOAA Fisheries to build on the spirit of the review by integrating on-going program review (perhaps internally on an annual basis), acting on the findings and recommendations of this review, and reporting out on how the agency has considered and addressed the recommendations provided in the external review summary report.

Review Question Synthesis

Below is a synthesis of key findings and recommendations by each of the seven 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 perspectives. Throughout this synthesis, themes from specific panelist reports are indicated by referencing the panelists *in italics* (e.g. "Panelists 1, 2, 3"). Given the areas of overlap and linkages between the questions posed by NOAA Fisheries, panelists inevitably spoke to similar themes in response to multiple questions (although *italicized* references to panelist perspectives are generally limited to the specific question being answered). Again, more specific and detailed findings and recommendations are included in each individual panelist report, available in Appendix A.

Review Question 1 – *In the Habitat Enterprise strategic plan, our goal is to, “conserve habitat for managed fisheries and protected resources,” and one of the strategies for achieving this goal is expanding available habitat type by “increasing access to historic riverine rearing and spawning habitat for targeted diadromous fish species.” Where do you see us excelling in achieving this goal? What kinds of things could we be doing or doing more of to help us achieve this goal?*

Panelists' Observations – Strengths of NOAA Fisheries' Approach

Across the board, panelists praised NOAA Fisheries' approach, effort invested, and achievements around fish passage. In particular, panelists noted that NOAA Fisheries has accomplished much with limited resources by means of strong program design, management, and execution (*panelists 1, 4, 6, 8*) and staff talent and dedication (*all panelists*). A number of panelists also observed the impressive results that the fish passage programs have achieved in terms of miles of habitat accessed and stream miles opened, numbers of projects, groups empowered to complete fish passage projects, and innovative approaches pioneered (*panelists 1, 2, 3, 7*).

Some panelists highlighted the legal authorities (e.g. the Endangered Species Act) that NOAA Fisheries can avail itself of in pursuit of its goals and the agency's clear understanding of those authorities and effective use of them (*panelists 2, 6, 7*). A few panelists lauded the agency's commitment to self-reflection and learning, as illustrated by this review process (*panelists 1, 7*). Finally, panelists also observed the importance of partnerships with diverse parties for the agency's success and lauded the agency's efforts to cultivate partnerships (*panelists 2, 5, 6, 8*).

Panelists' Observations – Challenges of NOAA Fisheries' Approach

Almost universally, panelists stated that the overarching program goal statement (increasing access by 2020) is extremely vague and underwhelming. In calling for greater ambition and rigor, some panelists also suggested that the goals of the fish passage programs tend to define success in terms of implementation rather than biological effectiveness and that NOAA Fisheries should update its goals for fish passage from simply providing access to existing, in-channel habitat to opening access to a variety of complex habitats, restoring natural riverine processes, and improving habitat quality (*panelists 6, 8*).

Many panelists stated that NOAA Fisheries can do more to plan for an uncertain future, whether addressing environmental stochasticity, preparation for the effects of climate change, incorporation of adaptive management principles, or working with Congressional allies to preserve existing authorities (*panelists 1, 2, 4, 6*). Panelists also observed that the agency's current efforts in various areas can be somewhat ad hoc and lack scientific rigor, strategic and systematic approaches, and standardization across regions. For example, some panelists noted that program goals tend to define success in terms of implementation rather than biological effectiveness and the scientific basis for passage and restoration goals is not clear or consistent between regions (*panelists 2, 6, 7*).

Finally, a few panelists highlighted shortcomings in internal coordination within NOAA Fisheries, whether in the form of headquarters staff with a less-than-complete picture of the work being done in the regions, among the regions, between the hydropower and CPR programs within each region, and with other divisions/units of NOAA that make important contributions to fish passage (e.g., PRD and Fisheries Science Centers) (*panelists 6, 7, 8*). As a complement to this internal coordination, some panelists also identified internal and external limitations in current efforts with external partners, including seemingly minimal mindfulness by NOAA Fisheries'

staff to Native American tribes' roles and, in some cases, limited participation in FERC relicensing by states (*panelists 2, 6, 7*).

Panelists' Recommendations

Panelists contributed a number of recommendations in response to review question #1. Many panelists urged NOAA Fisheries to more clearly and precisely define its vision and goals to help plan for an uncertain future. This includes developing a more focused vision statement, strategic goals that provide a clearer vision for the expected outcomes the agency wants to achieve, and targets to make progress toward achieving the goals over time. Panelists also suggested incorporating greater scientific rigor into the agency's vision and goals-setting processes including, for example (*panelists 1, 3, 4, 5, 6, 8*):

- Accounting for future predictions of water quality and quantity, as well as climate change
- Developing habitat and eventually production estimates for target species in sites
- Defining "adequate fish passage" to give biological significance to the terms, "safe, timely, and effective" based on the demographics of priority species
- Developing SMART goals that incorporate adaptive management practices
- Developing passage survival standards that are supported by defensible science, are measurable, and are verifiable
- Incorporating project prioritization using science-based evaluation of dam impacts and outcomes from proposed actions
- Using population models that rationalize fish passage prescriptions, passage survival standards, restoration priorities, and program performance metrics

A number of panelists also lauded NOAA Fisheries for investing effort and resources in undertaking the review process, and they encouraged the agency to build on the review effort. Panelists urged NOAA Fisheries to apply the lessons learned through the review process as well as institutionalize the review process through (for example) conducting annual internal program reviews. Panelists also urged the agency to push itself to ambitiously envision its future, considering questions such as (*panelists 1, 3, 4, 7*):

- What's the next set of accomplishments to achieve? What is the next bar to surpass?
- NOAA Fisheries 20 years ago did not look like it does now, did not do many things that it does now – that difference is the legacy of the present generation of doers and leaders – what is the next legacy going to be?
- What concrete benefits to the resource is NOAA Fisheries looking for in coordinating the hydropower and CRP programs – what synergies and empowerments are possible for NOAA Fisheries as an agency and in the future development of its programs? What are the opportunities that *the agency* sees?
- What is NOAA Fisheries striving to *become*? What does it want to add to in terms of institutional functionality, leveraging scarce resources, extending its reach, and reaching new/higher level goals? The issue may be not so much what is not working as how much more the agency could be. What inspires the agency and its staff?

Many panelists also encouraged NOAA Fisheries to enhance structures and practices for internal coordination, including between headquarters staff and regions, OHC and PRD and the Fisheries Science Centers, hydropower and CRP program staff, and throughout and across regions, including via site visits, detail assignments and rotations, and enhanced communication. Enhanced internal coordination could enhance understanding across silos, improve coordination and consistency, and making greater use of legal authorities (*panelists 2, 3, 6, 7, 8*). Some panelists also advocated for an enhanced effort to build external partnerships, including with USFWS and other federal agencies, state agencies, Indian tribes, and NGOs, including exploring possibilities for funding the purchase of high priority dams for removal (*panelists 2, 5, 6*).

Panelists also suggested that NOAA Fisheries can enhance its work towards its habitat conservation goals by pursuing tested approaches known to work, including emphasis on projects supported by local technical experts, reliance on known technologies (dam removal or tried-and-true fishway designs vetted by agency engineers), support of experienced applicants with proven track records, and establishing survival standards rather than passage measures (*panelists 2, 6*). A few panelists also encouraged the agency to shift or broaden its programmatic focus, for example by being more open to funding fishway projects through the CRP program (in addition to high-impact dam removal projects), pursuing a watershed scale strategy within the hydro licensing arena, placing greater priority on implementation over evaluation, and more fully considering a broader array of species (*panelists 2, 3, 4*). Finally, panelists also encouraged greater awareness-raising on Capitol Hill about the importance of maintaining current authorities and also exploring whether federal trust responsibility to Indian tribes can provide additional leverage (*panelists 2, 6*).

Review Question 2 – How do we better integrate Hydropower regulatory requirements and timelines with voluntary habitat restoration opportunities into a strategy for addressing highest priority barriers?

Panelists' Observations – Strengths of NOAA Fisheries' Approach

Panelists identified a few different approaches to prioritization used by the regions as particularly promising. For example, panelists expressed support for (*panelists 1, 3, 6, 8*):

- Strong partner-led prioritization, which allowed for more detailed information on barriers to be incorporated into the prioritization process including habitat quality and quantity above the barriers.
- The use of GIS to identify priority watersheds and then select priority areas within priority watersheds for restoration, which results in a record being developed for FERC submissions, evaluates the engineering and biological feasibility of prescriptions and builds support among stakeholders for the proposed approach, and provides for flexibility to adapt as actions are implemented.
- Integration of factors such as amount and quality of habitat available above barriers; NOAA Fisheries plans, state recovery plans, and tribal plans; regional species priorities; and passage feasibility into prioritization.

Panelists also identified a handful of factors and opportunities that support integration of hydropower regulatory requirements and timelines with voluntary habitat restoration, including (*panelists 2, 6, 7*):

- Predictability and ability to plan (e.g. FERC re-licensing schedules are known; CRP receives all grant applications and knows their geographic setting).
- Leveraging respective and complementary strengths of the CRP and Hydropower programs. For example, the regulatory authorities vested in the Hydropower program and the funding available through the CRP together create carrot-and-stick incentives for FERC-licensed dam operators and other responsible parties.
- Given limited staff time and financial resources, prioritization and integration of efforts across the CRP and hydropower programs can help rationalize resource allocation in line with restoration efforts that are aligned with local species and restoration priorities.

Panelists' Observations – Challenges of NOAA Fisheries' Approach

Panelists observed that a key challenge for coordination between the hydropower and CRP programs are the two programs' respective structures and current misalignment between them. Specifically, panelists noted that the programs are managed at different levels (one regionally and the other national); program staff are separated across towns and states, impeding communication; the programs have different mission priorities; the large number of projects managed by the hydropower program; and owing to these various factors, each program making decisions that may be at cross-purposes with enhanced integration with the other program. (*panelists 3, 5, 6, 7*)

Panelists' Recommendations

A number of panelists recommended that there be greater high-level strategic alignment of the hydropower and CRP programs to enhance integration across them. This alignment could be achieved in various ways, including bringing together lines of authority between the two programs, creation of a steering team comprising headquarters staff and division chiefs, or clarifying and aligning respective national and regional roles across the two programs. Similarly, some panelists suggested that prioritization across potential fish passage projects should be seen as a strategic priority for NOAA Fisheries and should be placed in the context of agency strategy, organization, program coordination, and overall objectives, which should set the overall framework within which priorities can be identified and ranked. Panelist #4 went further to suggest that NOAA Fisheries develop a true watershed-scale Hydro program strategy based on the ability to bring together for licensing hydro projects in target watersheds. To support integration across the programs and consistency across regions, some panelists suggested replication of promising prioritization approaches (*see Strengths, above*) or standardizing the prioritization process across regions. (*panelists 1, 3, 4, 6, 7*)

Some panelists also highlighted the opportunities to leverage the programs' respective tools and strengths (*see Strengths, above*) as potential incentives to bring parties to the table and increase fish passage opportunities. This identification of respective strengths could also serve as an incentive for greater coordination among the programs themselves. This approach points to the reality that much integration and coordination currently happens among program staff

on the ground and panelists suggested that NOAA Fisheries actively identify staff who are pursuing innovative integrative solutions and support their efforts. (*panelists 4, 5, 6, 7*)

A few panelists also suggested specific tools and approaches that could enhance integration across the two programs, such as including both hydropower and non-hydropower facilities in mapping and prioritization exercises, vetting regional program priorities with local public stakeholders, involving a broader group of staff in the CRP project proposal review process, assigning a liaison between the programs in each region, and revising the CRP project selection criteria and weighting to prioritize and enhance integration. (*panelists 5, 6, 7, 8*)

Review Question 3 – How do we better incorporate a “watershed” approach into high priority fish passage habitat restoration?

Panelists’ Observations – Strengths of NOAA Fisheries’ Approach

Many panelists noted that NOAA Fisheries faces significant structural challenges (detailed below) in effectively pursuing and adopting a watershed approach. That said, panelists noted that the agency has had notable successes, for example in the Klamath and the Yuba Rivers, from which it can learn and build. Panelists noted that, in these examples, NOAA Fisheries has demonstrated the ability to coordinate effectively with diverse stakeholders in highly complex situations and that the agency has acted as both a leader and strong partner. More specifically, panelists noted that the agency has been able to help diverse stakeholders come to the table and get on the same page and be ready to act in a concerted manner; in other contexts, some regions have made exemplary efforts at coordination in support of the watershed approach, going so far as to establish cross-division teams to develop watershed plans for multiple priority watersheds. (*panelists 2, 3, 5, 7*)

Panelists also applauded the leadership and approach demonstrated by NOAA Fisheries staff members who have spearheaded a watershed approach. Panelists noted that driven staff with a vision and willingness to play a leadership role have demonstrated their ability to take discrete opportunities and leverage them to build watershed approaches. Some panelists also recognized that hydropower and CRP staff seek to apply the best available science when designing and selecting projects, and in some cases program staff work with researchers to advance scientific knowledge and fill data gaps. (*panelists 5, 6, 7*)

Panelists’ Observations – Challenges of NOAA Fisheries’ Approach

Panelists across the board acknowledged that adopting and successfully executing fish passage work at a watershed scale is a complex and challenging undertaking. They noted that effective watershed planning requires information bases that vary in quality, quantity, and availability across regions. Additionally, relicensing opportunities are not synchronized so it is difficult to coordinate relicensing activities throughout a watershed when those activities are spread over years or decades. Personalities of those involved must also be compatible. Pursuing fish passage work at a watershed level also requires ample staff time and financial resources. Panelists observed that the NOAA Fisheries divisions have different triggers and drivers and may not be working in sync within a region or on a specific watershed, thereby leading to

missed opportunities for watershed-level work. Even when all of these hurdles can be overcome, success is not guaranteed. (*panelists 2, 3, 5, 6, 7*)

Some panelists went further to put forward the case that NOAA Fisheries' current project-by-project focus is too narrow and that NOAA Fisheries experts are looking (too narrowly) at the watershed program in terms of their fishery expertise and creating detailed programs for fish, without sufficient attention to how the fisheries programs work in the context of hydropower projects. Additionally, the current approach of assigning a hydropower coordinator in the national office, with whom regional offices voluntarily coordinate, does not proactively develop and advocate for an overall solution to hydropower licensing on a watershed basis. (*panelist 4*)

Panelists' Recommendations

Panelists offered a number of recommendations to support the success of watershed-scale work. For example, some panelists suggested that high-level coordination and leadership from headquarters could greatly facilitate effective watershed-scale efforts. Some panelists advocated for the adoption of a strong, headquarters-driven, national strategy to seize the opportunity and realize the benefits to NOAA Fisheries' mission and objectives of implementing a watershed approach to hydropower as opposed to engaging in hydropower relicensing on a project-by-project basis. Within NOAA Fisheries, such a program would need to be given leadership authority to guide and integrate participation in hydropower licensing that occurs at the regional scale. Another flavor of this headquarters-driven strategy would have CRP supervisors ensuring that all regions adopt the watershed approach, to the extent they can, in strategic planning for passage restoration in priority watersheds. Other panelists encouraged headquarters to play more of an internal coordination role. For example, leadership of NOAA CRP, Hydropower, PRD, and Fisheries Science Centers could review organizational capacity and set appropriate expectations for cooperation among all the divisions/units with a role to play in promoting and securing fish passage. Panelists also suggested organizing periodic meetings among all regions on lessons learned and successes. Headquarters could also work *outside* of the agency, for example by developing a strategic approach for working with FERC to improve the development of watershed approaches through collaborative or strategic agreements on desired outcomes for watershed plans. (*panelists 1, 4, 5, 6, 7*)

Recognizing that local staff currently play key leadership roles in recognizing promising opportunities and pursuing watershed-scale work, a variety of panelists also suggested that training and otherwise supporting staff would be useful. Training could be in facilitation skills and in recognizing potential watershed opportunities. Staff, including younger staff members, who have not participated in watershed approaches could learn from their colleagues who have effectively pushed forward these efforts. Beyond training, panelists also suggested that PRD and the science centers could assist regional staff in assembling, analyzing, and understanding the available fish population data relevant to watershed planning. (*panelists 1, 3, 4, 6*)

In addition to training staff, a few panelists offered suggestions for other approaches and practices that could help prepare staff and regions to undertake watershed work when conditions align. Regions could perform needs assessments to identify information, resources,

and assistance (e.g., Science Center, PRD) required to implement a watershed approach, as well as develop restoration program goals and performance indicators for priority watersheds based on the understood biological requirements (e.g., viability criteria) of priority species. To identify potential opportunities earlier, a NOAA Fisheries staff member (or state counterpart) could participate in the project team for large civil works (e.g. roads, dams) to monitor development so that the agency is able to engage early/appropriately. Panelists also suggested that enhanced coordination internally could help identify opportunities earlier, and once promising watersheds are identified, then work can commence on producing watershed management plans. *(panelists 3, 6, 8)*

Panelists also offered the following suggestions for pursuing a watershed approach:

- Pursue a national program for hydro regulatory strategic policy development and leadership to raise NOAA Fisheries' view above the opportunistic project-by-project level. This will require direct interaction with the hydro industry and collaboration on new legislation and regulatory policy to create a framework for watershed-scale hydro licensing. The goal would be to develop a proactive hydro watershed-scale regulatory strategy in collaboration with FERC and the hydro industry and help craft implementing legislation that can be sponsored in Congress. *(panelist 4)*
- Some panelists emphasized that cultivating relationships with stakeholders is critical, including the hydropower industry and individual dam owners, the general public, and policy-makers on Capitol Hill (to secure additional resources for watershed-scale work). *(panelists 3, 4, 7)*
- Given that a watershed approach is about the entire watershed, NOAA Fisheries can work flexibly to meet its larger goals. In this context, prioritization of barriers may not always be helpful (and might impede larger success), the order in which barriers are removed may not matter, and through enhanced coordination and a flexible approach to barrier removal, the CRP and Hydropower programs can create incentives for each other in achieving passage or removal throughout the watershed. *(panelists 3, 5)*
- The CRP grant programs could be modified to better support longer term, watershed-scale approaches to fish passage, for example by setting aside grant funds to provide funding support for systems with the opportunity to address multiple barriers within a system or by setting aside funds from each year's appropriations for on-going projects and next-step projects in watersheds where they have decided to make a sustained effort. *(panelists 5, 7)*

Review Question 4 – How can we better coordinate our Hydropower and Community-based Restoration projects to build momentum within a watershed to open and create more opportunities for accessible habitat?

Panelists' Observations – Strengths of NOAA Fisheries' Approach

Panelists expressed support for the successful coordination efforts explored during the panel review and suggested the NOAA Fisheries build on and learn from these successes. For example, they commented that the Southeast Region illustrates the helpful role that third-party partnerships can play in stimulating coordination, development of a holistic approach, and

increased funding effectiveness. Panelists also suggested that the Hydropower and CRP programs have a natural intersection of objectives that lend each other mutual support and that each program's complementary strengths can be leveraged. In particular, the regulatory authorities vested in the Hydropower program and the funding available through the CRP together create carrot-and-stick incentives for FERC-licensed dam operators and other responsible parties. Additionally, FERC licenses offer opportunities to restore and improve passage to habitats where CRP restoration activities can enhance the mitigation value of prescribed license terms. (*panelists 1, 3, 6*)

Panelists' Observations – Challenges of NOAA Fisheries' Approach

Panelists observed that mismatches in authority, drivers, and the like between the Hydropower and CRP programs make coordination challenging. In particular, Regional CRP offices are closely supervised through HQ while regional Hydropower offices are given relative autonomy. The different lines of authority may hamper development of consistent regional policies on cross-program coordination. Furthermore, the programs have different drivers, triggers, timescales and scope, leading to divergent staff obligations. This may preclude cross-program coordination and result in missed opportunities for complementary fish passage and restoration planning in FERC license proceedings. At present, coordination is largely *ad hoc* and driven by personalities, not principles or policy. (*panelists 1, 3, 6, 8*)

Panelists' Recommendations

A number of panelists encouraged NOAA Fisheries headquarters to play a greater role in facilitating coordination between programs, with some going further and encouraging restructuring and realignment of program structures and lines of authority to encourage greater coordination. In terms of strengthening coordination, panelists provided a variety of suggestions, including (*panelists 1, 3, 5, 6, 8*):

- The formation of a steering team comprising headquarters and regional staff that looks ahead in a once-per-year evaluation of efforts
- Establishing policies in both Hydropower and CRP that require regional programs to coordinate in developing watershed restoration frameworks at the outset of strategic planning for FERC license proceedings
- Communicating all policies, conclusions, and directions reached in HQ-level Hydropower/CRP coordination to regional staff through HQ-sponsored regular coordination calls
- Establishment of a Fish Passage Liaison to work across all programs in NMFS that touch on fish passage
- Regional briefing reports between Hydropower, CPR and PRD with ground level staff
- Holding semi-annual online conferences of fish passage-related staff
- Using staffing details and temporary assignments to enhance familiarity and build relationships across programs and divisions
- Making cross-regional staff available for consultation

Going further, some panelists also encouraged NOAA Fisheries to consider some realignment of the programs to provide increased Headquarters oversight and guidance over the Hydropower Program while preserving regional autonomy similar to regional CRP staff.

Panelists also provided suggestions for proactively identifying opportunities for greater coordination. They noted that early coordination facilitated by NOAA in areas without an integrated watershed plan would be a particularly valuable step. This could be accomplished by an internal staffing detail or developmental assignment, or by a consultant/facilitator brought in on contract. A watershed plan could also support coordination at the point of monitoring. Panelists also highlighted the potential benefits of establishing a clear vision as early in the process as possible, co-locating Hydropower and CRP staff in the regions wherever possible, coordinating early and often during upcoming FERC license proceedings, and developing watershed restoration frameworks for priority watersheds that guide the development of strategies and objectives for FERC license terms. (*panelists 2, 3, 5, 6*)

Some panelists focused on how the Hydropower and CRP programs can leverage their complementary strengths in service of enhanced coordination and greater effectiveness. They encouraged NOAA Fisheries to think about how each program can incorporate its sister program in creating opportunities for itself, and vice versa. For example, FERC licenses offer opportunities to restore and improve passage to habitats where CRP restoration activities can enhance the mitigation value of prescribed license terms. Furthermore, looking beyond the Hydropower and CRP programs, PRD may have avenues to help engage reluctant barrier owners, thereby enable the type of synergy that a watershed approach make possible. (*panelists 4, 6, 8*)

Finally, one panelist provided a number of suggested mechanisms to support collaborative efforts, including (*panelist 7*):

- Ensure that staffing levels and workload are balanced such that staff have sufficient capacity to be involved in partnerships, even early stage partnerships, where the interests and motivation of multiple agencies and other organizations may coalesce to enhance the prospects for watershed-scale restoration.
- Recognize the value of partnerships led by third parties for accomplishing NOAA's Fish Passage goals more cost effectively than the agency can do on its own, or even through agency-led partnerships.
- Support partnerships at various stages of development, from providing seed money to help hire coordinators for nascent partnerships to working closely with well-established partnerships to identify and implement the partnership's highest priority projects.
- Continue to expand engagement of NOAA scientists and others with expertise in landscape-level conservation design to develop tools for watershed-level and project-level prioritization.
- Seek to increase staff capacity through project proponent-funded positions to work as project-specific consultation biologist to help with moving hydropower licensing process through and completing Section 7.
- Work in concert with regional partners (e.g., other agencies, tribes, NGOs) to set priorities within regions. Avoid setting priorities in isolation.

Review Question 5 – How can we improve our strategy and structure for evaluating agency-wide fish passage program outcomes?

Panelists’ Observations – Strengths of NOAA Fisheries’ Approach

While panelists acknowledged the limitations of current monitoring and evaluation efforts (particularly the focus on “stream miles opened” as the primary metric used), they applauded the agency for seeking to enhance its monitoring and evaluation efforts. Additionally, panelists commended the CRP monitoring framework for being clear, flexible, and adaptable. They also expressed support for the Tier I and II monitoring implementation effectiveness approaches developed during the Open Rivers Initiative. Finally, panelists noted that NOAA Fisheries has diverse stakeholders and needs to tailor its reporting accordingly, using both high-level metrics that are understandable to non-technical audiences and biologically meaningful metrics of project effectiveness and biological response important for both internal purposes and its more technically sophisticated stakeholders. (*panelists 1, 3, 6*)

Panelists’ Observations – Challenges of NOAA Fisheries’ Approach

Panelists widely voiced concern about the limitations of current monitoring and evaluation efforts in terms of determining the biological significance and documenting the diverse benefits of program efforts. In particular, the “stream miles opened” metric is seen as conveying little of significance to evaluating biological outcomes. A particular gap that panelists highlighted is that performance standards for downstream passage effectiveness are not specified and monitored on all projects. Current monitoring and evaluation efforts also fail to capture all of the benefits generated through the CRP and Hydropower programs. For example, improving passage conditions at existing fish passage facilities in systems where access is currently provided at a suboptimal level is not captured in the “stream miles opened” metric. (*Panelists 1, 6, 7, 8*)

Accompanying the call for introducing stronger monitoring and evaluation efforts, however, some panelists acknowledged that organizing an effective monitoring approach, coordinating and managing monitoring efforts, and analyzing the data produced using an adaptive management framework or structured decision making requires significant time and resources. Furthermore, outcome-based performance metrics require years of detailed pre- and post-project data collection, which is likely to be beyond the time horizon of the CRP’s current grant programs. (*Panelists 1, 6, 7*)

Panelists also noted that current monitoring and evaluation efforts generally are not well structured to enhance program effectiveness. The absence of SMART objectives and adaptive management frameworks means that evaluation does not inform improvements to the programs. In addition, the diversity of evaluation approaches across regions and programs lacks consistency, with every project seemingly starting from scratch and thereby impeding learning across the organization. (*Panelist 3*)

Panelists’ Recommendations

Panelists provided a variety of specific recommendations to enhance monitoring and evaluation efforts in the fish passage programs. Conceptually, panelists stressed that monitoring and evaluation efforts must be holistic and also tailored to the fish passage programs and their

specific needs. For example, panelists highlighted the importance of evaluating projects over the course of species' full lifecycle; in particular, panelists identified downstream passage effectiveness at fishways as a gap in many current monitoring efforts. Panelists also noted that evaluation efforts should be tailored to the fish passage programs and their specific needs. Given that various other factors can affect population health beyond the activities of the fish passage programs, some panelists suggested choosing dis-integrated project performance metrics at temporal and spatial scales that reflect project effects and are not confounded by unrelated events. Metrics, and how they are reported, should also reflect NOAA Fisheries' diverse audiences and their respective roles and level of technical sophistication as well as the level of scientific precision that exists and that is relevant for the intended audience. (*Panelists 2, 3, 4, 6, 7, 8*)

Panelists put forward specific suggestions for additional metrics that NOAA Fisheries can use, including the following (*Panelists 2, 3, 4*):

- Routinely evaluate and score all passage projects to ascertain the extent and quality of habitat to which fish gain access.
- Ensure evaluations completed by Hydropower Program staff of each FERC relicensing/settlement agreement include a list of features/conditions that NOAA wanted in the new license and a list of features/conditions that were ultimately included; summary of staff time and effort; and how the license conditions/features will help support recovery, de-listing, restoration, or enhancement of Trust species in accordance to any recovery or management plans. Given the results, staff should grade the outcome in some manner (A through F, 1 through 10, excellent through poor).
- Poll non-NOAA partners (such as state partners) in all regions to get their assessment of the effectiveness of regional staff.
- Consult with colleagues in the Protected Resources Division and Science Centers on the effectiveness of the fish passage programs.
- Track miles of habitat improved.
- Track miles of habitat connected.
- Develop and use protocols to evaluate the provision of such habitat enhancements as gravel restoration, side channel development (etc.) when it participates in and evaluates project mitigation in hydro relicensing.
- Begin to move towards tracking the amount of habitat and the expected productivity gained from fish passage removal and eventually develop frameworks for tracking increased numbers of fish supported by certain actions.

Panelists also provided suggestions for processes and resources that could help the agency develop additional metrics, including the following (*Panelists 1, 6, 7*):

- Establish an initiative or task force, including staff from both the Science Centers and regions, to brainstorm and recommend additional metrics that can be standardized across projects and regions and that can be collected at a reasonable cost. Begin with the end in mind—what is the question the data are addressing? What analyses will be conducted using the data? What are the metrics that support the approach?

- Use NOAA Fisheries’ scientists to help regions develop restoration priorities and a consistent set of biologically meaningful program performance metrics. Regions could then build restoration frameworks for priority watersheds that describe restoration goals and strategies in the context of the biological priorities identified.
- Hire one or more post-docs at each science center to work on fish passage investigations and to help design a more meaningful approach to performance metrics.

Panelists also suggested diverse strategies for using metrics to evaluate program outcomes and then feed the data back into program implementation, including the following (*Panelists 3, 4, 5*):

- Database fields for habitat efforts, methods used, link to location of detailed documents
- Link data collection to data needs. For example, collect temperature and fine scale habitat surveys, growth rates, and feed into a GIS effort with local partners. Use the science center of post-docs to analyze data, produce restoration science that can inform best practices.
- Establish headquarters-level guidance for Hydropower staff engaged in developing license conditions (prescriptions or settlement agreements). For example, all conditions relating to efforts to improve fish passage could include requirements that certain efficiency standards be met, have to adhere to X level of specificity, etc.
- Create protocols for analyzing monitoring data acquired and using said analysis to modify and inform future efforts.
- Investigate the ways in which the diversity in the typical sizes of projects among the regions lends itself to different strategies in each region.

Review Question 6 – Within our program activities, what is the most effective balance for investing in implementation and monitoring and evaluation?

Given that resources for monitoring and evaluation of CRP projects are often very limited but that FERC requires licensees to shoulder responsibility for monitoring and evaluation of their projects, panelists’ observations and recommendations are differentiated below to distinguish between the two programs.

Panelists’ Observations – Strengths of NOAA Fisheries’ Approach

For CRP: Panelists observed that the current allocation of funding towards monitoring and evaluation (approximately 5 to 10% of program funds) is roughly aligned with other large habitat restoration programs. They also noted that CRP has a variety of different kinds of projects to pick and choose from when deciding which should include monitoring and evaluation. (*Panelists 1, 2*)

For Hydropower Program: Allocation of resources for monitoring and evaluation is not as significant of a challenge in the Hydropower Program because licensees bear this cost.

Panelists’ Observations – Challenges of NOAA Fisheries’ Approach

Panelists observed that the dilemma of how to allocate limited resources between implementation and monitoring and evaluation is a common, and difficult, one for habitat

restoration programs. Both elements are important and there is a core tension between the need to implement actions on the ground and the need to evaluate what has changed and use that information to communicate progress and adaptively manage a program. Panelists also noted that there is no clear rationale or model for partitioning restoration funding between implementation and monitoring and evaluation. Arguably, the level of investment in monitoring and evaluation should be determined by its purpose; project effectiveness monitoring is a relatively simple assessment while biologic effectiveness monitoring is typically more complicated, expensive, and difficult to achieve in many settings. Biologic effectiveness monitoring, as important as it is to project selection, can drain funds better spent on “no regrets” restoration projects that are known or strongly suspected to produce fish benefits. The imperative to “get things done” can be particularly challenging for monitoring and evaluating visionary or large-scale efforts that potentially could be most effective as these are more likely to require a long-time horizon for both implementation and evaluation. *(Panelists 1, 6, 7, 8)*

For CRP: Panelists highlighted that CRP grant awards are often limited in both time and money and skewed towards project implementation, thereby making it challenging to conduct meaningful monitoring and evaluation. *(Panelists 2, 3, 5, 6)*

Panelist perspectives varied significantly about the importance of monitoring and evaluation for CRP projects: some panelists observed that, in all projects where data were collected, the conclusions from monitoring and evaluation changed project prioritization and planning, thereby indicating that monitoring and evaluation can and usually does improve project design and performance. In contrast, other panelists emphasized that the structure of CRP projects and the expertise of the CRP project sponsors favors efficient implementation and that project sponsors’ energy are better targeted at implementation rather than being tied down with long-term monitoring and evaluation efforts. *(Panelists 2, 3, 5, 6)*

For Hydropower Program: Panelists observed that, although licensees are required to conduct monitoring and evaluation, their work must be checked for veracity by NOAA Fisheries staff. *(Panelists 1, 2, 7)*

Panelists’ Recommendations

For CRP:

Panelist #1 suggested that NOAA Fisheries’ approach to balancing resource allocation between implementation and evaluation should be driven by program need and the purpose of monitoring and evaluation. This panelist suggested a three-stage process for determining resource needs: first, address what metrics are needed to support hydropower program and CRP actions and accomplishments. Second, identify the monitoring needed to calculate and evaluate the metrics. Third, incorporate regional variability into the equation—are different metrics needed in different regions? Once these aspects of “what’s needed” have been developed, then costs and the appropriate proportion can be estimated.

Panelists provided diverse perspectives on how to strike a balance between implementation and monitoring and evaluation within CRP projects. Some panelists emphasized that past

monitoring efforts have been very fruitful in enhancing the programs and, therefore, monitoring and evaluation should be further prioritized. Others argued that the balance should greatly favor implementation and monitoring and evaluation should be pursued only when such monitoring and evaluation has the potential of expanding knowledge and influence future management decisions. In terms of suggesting a concrete distribution of resources between implementation and monitoring and evaluation, several panelists suggested that maintaining the current allocation (approximately 5 to 10% of program funds), with a heavy focus towards implementation, is appropriate. *(Panelists 2, 3, 5, 6)*

Panelists also provided recommendations about how to use limited monitoring and evaluation wisely and efficiently, including the following *(Panelists 2, 5, 6, 7, 8)*:

- Subsample projects and earmark only some of them for evaluation and monitoring instead of requiring all projects to include evaluation.
- Continue focusing Tier 2 level monitoring efforts on representative projects that provide an index by which to measure effectiveness on a broad array of similar projects.
- Identify knowledge gaps where the effectiveness of particular restoration techniques for particular species are not well understood; invest in thorough scientific investigation of these techniques.
- Reduce monitoring on project types that have an established track record unless first level monitoring shows unexpected malfunction.
- Coordinate with other agencies and tribes to leverage their monitoring efforts and reduce program investments in M&E relative to implementation.
- Issue an RFP to academics to study the earmarked projects, using set-aside funds rather than requiring the project sponsor (a non-science based NGO) to evaluate the projects.
- Use citizen-science both to collect dispersed and on-site data and to engage the public.

For Hydropower Program:

Some panelists suggested that, although Hydropower Program monitoring and evaluation costs are borne by licensees, NOAA Fisheries should conduct a review (or a synthesis of lessons learned) of monitoring prescribed under Section 18 prescriptions. They also encouraged the agency to play a kind of oversight role, monitoring the licensee's monitoring and evaluation to ensure it is being conducted per the license conditions. *(Panelists 1, 2)*

Review Question 7 – What are steps we can take to improve our outreach to ensure we are effectively communicating the importance of fish passage?

Themes below reflect both those contained in panelist reports and also a distillation of key comments and input from the open discussion about this question during the review panel meeting on May 23, 2018.

Observations – Strengths of NOAA Fisheries' Approach

NOAA Fisheries has many strengths to build on in its outreach and partnership efforts. The agency already does well in these areas, particularly in certain past projects (e.g. Klamath and Yuba case studies) and with like-minded allies both nationally and regionally. Furthermore, NOAA Fisheries is recognized by many stakeholders as a key player in fish passage, and the

agency has both the legal authorities and bully pulpit to convene and be heard by stakeholders. The agency also has notable successful examples in which it has convened broad coalitions to push forward shared goals and in which it has been proactive and effective in initiating partnerships, providing information, and cultivating the development of partnerships. *(Panelists 2, 3, 4, 7, 8; discussion at panel review)*

Observations – Challenges of NOAA Fisheries’ Approach

A key challenge facing NOAA Fisheries is that it can lack coherence and clarity internally about its external-facing engagement and communications strategy and efforts. In line with the comments reflected above about programmatic and strategic misalignment between the CRP and Hydropower programs (and others, including PRD and the science centers), NOAA Fisheries can lack internal coherence in its outreach and engagement efforts with stakeholders. This can manifest in the form of different messages and approaches between divisions within a region or, at a national level, the absence of a coordinated messaging strategy across the agency. For example, panelists noted that a lack of alignment between Hydropower and PRD staff can lead to NOAA getting shut out of ESA-related negotiations. *(Panelists 1, 6, 7; discussion at panel review)*

A second key challenge facing NOAA Fisheries is that, while the agency can be very strong at engaging a core group of like-minded “usual suspects,” the agency can struggle to reach beyond those stakeholders to effectively engage a broader group of important stakeholders. In particular, the agency struggles to engage with non-traditional partners, including utilities, private entities that own or operate passage barriers, Native American tribes, FERC, and the US Army Corps of Engineers. *(Panelists 3, 6, 8; discussion at panel review)*

Recommendations

A variety of recommendations emerged from panelists’ reports and the discussion during the review panel to enhance NOAA Fisheries’ approach to stakeholder outreach and engagement. Three types of recommendations came to the fore: 1.) enrich understanding about how the agency can effectively conduct outreach and engagement, 2.) enhance coordination within NOAA Fisheries, and 3.) specific strategies, approaches, and tools for outreach and engagement.

Enrich understanding regarding effective outreach and engagement: In addition to specific feedback and suggestions already surfaced through this panel review process, panelists also suggested a few additional approaches to assess the agency’s engagement and outreach *(Panelists 1, 3, 4):*

- Regions take the lead on developing ideas for working with partners on ways to better communicate the broad benefits to society from implementing fish passage improvements, as well as specifically articulating how these actions will result in progress toward reaching NOAA Fisheries’ programmatic goals.
- Formally request feedback from partners, stakeholders, and grantees about how CRP outreach could be improved (for example, a survey or needs assessment).
- Engage a professional public outreach and communications consultant.

Enhance coordination within NOAA Fisheries: Some panelists stressed the importance of greater coordination and coherence within NOAA Fisheries about its goals and approaches in key areas and its attendant communications and engagement efforts. An important area for greater internal coherence is in integrating PRD and Office of Habitat Conservation objectives within a watershed and FERC relicensing project into a common NMFS vision that is then presented early in the relicensing process. Panelists noted that coordination with PRD is particularly important in this regard due to frequent misalignment between PRD and Hydropower Program staff, resulting in NOAA getting shut out of ESA-related negotiations. Additional suggestions for enhanced coordination include development of a communications plan and consistent use of national branding for the agency's fish passage programs. *(Panelists 1, 7; discussion at panel review)*

Strategies, approaches, and tools for outreach and engagement: Numerous recommendations also emerged from panelists and the review panel session about strategies, approaches, and tools that NOAA Fisheries can use for more effective outreach and engagement. These include *(all panelists; discussion at panel review)*:

- *Begin early.* For example, identify strategic approaches years in advance of the beginning of focused efforts on a high priority FERC relicensing project. Another example would be to develop a communications strategy for upcoming projects and use it to gather input on plans and to build consortiums.
- *Highlight accomplishments.* Issue press releases for completed projects and for year-end accomplishment summaries, both locally where projects have been completed and nationwide to reach communities where projects were not completed but where there are dams. Demonstrate wins and distinguish between the approaches of the Habitat Conservation division and PRD and Sustainable Fisheries groups by highlighting community efforts and partnership building.
- *Use secondary benefits.* The best way to achieve fish passage outcomes (from a messaging perspective) may depend on messaging around secondary benefits (e.g., improved safety, economics, infrastructure investments, recreation) of a project. This can improve standing within a local community, increase the agency's ability to broaden its partnerships and coalitions, and provide for a more robust cost-benefit analysis.
- *Leverage partnerships.* Recognize that in many cases the most important communicators for the program's work is its partners. Make it easy for partners to access the information they need to communicate about the program's contributions and accomplishments. Seek input from partners about what their needs are to assist them with their outreach efforts.
- *Build new partnerships.* While NOAA Fisheries has very strong relationships with certain stakeholders, much more can be done to reach and engage other key stakeholders, such as building on the trust that the agency's current partners may have with these other parties. Ongoing success may depend on strengthening relationships with stakeholders such as utilities, private entities that own or operate passage barriers, Native American tribes, FERC, and the US Army Corps of Engineers. The engagement approach with Native American tribes should be two-pronged, pursuing both a Native American Policy

within the Habitat Enterprise program that encourages regions to seek partnerships with local tribes and pro-active development of partnerships with regional tribes.

- *Concentrate outreach and engagement in priority watersheds.* Most regions have a rough idea of priority areas for restoring fish passage. Invest in staff, partnerships, and unique messaging opportunities to lay the groundwork for future fish passage efforts.
- *Explore new areas.* Recognize that successful projects ‘prime the pump’ for future projects. Fund small projects in areas where there have been no previous projects but where there are other potential projects that can be pursued if the local community can be motivated to support them.
- *Target and refine engagement.* After defining target audiences for particular outreach and engagement strategies, NOAA Fisheries should evaluate whether the mechanism, message, etc. resonates with that audience. For example, audience may dictate increased presence at technical conferences (if looking to reach practitioners) or the need for the need for more things like local editorial boards (if looking to lay the groundwork for future efforts within a watershed or community).
- *Engage funders.* Network with foundations and other private and public grant sources in marine and estuary science for collaborative funding and outreach, including through organizing funders forums.

Appendix A – Panelist Reports