Enclosure 1:

Memorandum Supporting BPA's Recommendations for Amending the Council's Fish and Wildlife Program

April 4, 2008

TABLE OF CONTENTS

Rationales for BPA's Program Amendment Recommendations

April 4, 2008 Staff Draft

This document and its appendix support BPA's recommendations by providing greater detail, scientific explanations, and legal justifications as appropriate to meet the requirements under the Northwest Power Act for program amendments.

A New Era

As the Council prepares to amend the Program, many entities in the region stand ready to begin a new, historic era in which we hope to cooperatively engage the difficult tasks inherent in protecting, mitigating, enhancing, and recovering fish and wildlife in the Columbia River Basin.

The FCRPS Action Agencies[1] and certain states and tribes are negotiating ten-year commitments to actions that support the Action Agencies' obligations both generally under the Northwest Power Act, as well as specifically for anadromous species listed under the ESA. The proposed commitments in these historic agreements include support for the actions in the forthcoming 2008 Biological Opinions for the FCRPS and the Upper Snake. The commitments also include actions already reviewed and recommended by the Council to BPA, as well as expanded and new actions. The prospective parties to these agreements concur that these commitments build upon and are consistent with the Program and further the Council's ongoing efforts to integrate Northwest Power Act responsibilities with ESA responsibilities. BPA anticipates being able to finalize its commitments in these agreements soon. When the agreements become available for external review, BPA hopes that the Council will appreciate the efforts the parties made to ensure consistency with the Program and the requirements under the Northwest Power Act.

These agreements establish new voluntary partnerships. They build on the Program, biological opinions, and recovery plans to embrace a comprehensive All-H strategy. They address the mitigation needs for both ESA-listed and unlisted species. As existing and future activities planned by resource managers,

[1] The FCRPS Action Agencies are the U.S. Army Corps of Engineers (Corps), the Bureau of Reclamation, and BPA. While these recommendations frequently summarize or refer to Action Agency commitments, particularly those in the 2007 Biological Assessment for Effects of the FCRPS, these proposed Program recommendations represent BPA's views only.

the Northwest Power Act calls on the Council to complement these agreements.[2] BPA recommends that the amended Program include these agreements in their entirety as additional measures to protect, mitigate, and enhance both listed and non-listed fish.

Once finalized, these agreements may stand alone. The Council should consider our remaining recommendations in this document as supporting the commitments in these agreements. If the Council perceives inconsistencies, then please assume that the commitments in the agreements are controlling.

Thoughts That Shaped BPA's Proposed Amendments

Any proposal runs many risks when it tries to recommend mitigation for all human caused impacts to fish and wildlife, especially when there is a statutory duty to guide fish and wildlife mitigation for impacts from hydroelectric facilities only. To keep its recommendations within the Act's limited mandate, yet embrace an all-H approach focused on ecosystems, BPA believes the following guidelines should shape the Program amendments. Each captures the essence of one or more legal requirements within the Act and thus applies to every amendment proposal.

1. Work with the Basin we have.
2. Focus BPA efforts on mitigating Federal Columbia River Power System (FCRPS) impacts.
3. Emphasize on-the-ground mitigation activities.
4. Complement existing and future mitigation activities agreed upon by resource managers.

1. <u>Work with the Basin we have.</u>

The Columbia Basin today in some respects hardly resembles that which European-American explorers encountered over 200 years ago. Over 130 hydroelectric dams block our rivers. In terms of numbers and biomass, the shad and exotic warm water fishes appear to have offset the historic salmon and steelhead runs. Streams lost their gravel and riparian habitat to mining. Irrigation dried up and dammed many tributaries. Grazing denuded uplands and riparian areas. Roads and development fragmented and depleted habitat, breaking up ecosystems. Mixed stock harvest, large scale hatchery production,

[2] 16 U.S.C. § 839b(h)(6)(A).

and gene pool management practices have affected many wild stocks. Flood control allowed humans to safely inhabit flood plains—historically the most productive fish and wildlife habitat. Human populations continue to grow, resulting in an ever-expanding human footprint in the basin's watersheds.

This is the world we live in now. Through the Program we can make some changes to this reality, but this reality limits the potential fish productivity of the Columbia Basin and what the Program can accomplish—especially if the Program guides FCRPS mitigation only.

When it passed the Act, Congress appreciated that "full mitigation" was impossible and it was not the Act's goal. Congressman John Dingell, who oversaw the drafting of section 4, noted that "Federal agencies and others in the region cannot correct past mistakes . . . many such mistakes unfortunately may be uncorrectable. . . ."[3]

The initial Program acknowledged the wisdom in not setting "full mitigation" goals. It stated that "[n]o amount of effort can restore the environmental conditions for anadromous fish that existed prior to the construction of hydroelectric projects."[4] The Council went on to state that "losses and goals are not identical. . . . The mitigation must take the system as it exists and provide a reasonable equivalent for what was lost."[5]

In 2001, the Independent Scientific Advisory Board (ISAB) confirmed the views Congress and the Council held when it stated that the Program can never achieve "full mitigation." "[I]t's not realistically achievable. . . ."[6]

The Program's goals and objectives—whether at the basin, province or subbasin level—need a scientific basis. Population, production, or harvest objectives that strive for full mitigation do not reflect the reality of all the limiting factors relating to the presence of human beings in the Columbia Basin. Consequently, population objectives based on historic harvest or population levels are fatally flawed if they don't consider the current human population and its growth rate in light of the current ecosystem's capacity.

[3] Congressional Record E5105 (Dec. 1, 1980) (statement of Representative Dingell).
[4] Council, 1984 Program at 2-2.
[5] *Id.*
[6] ISAB, Review of the Biological Objectives in the 2000 Program (document 2001-7) at 9.

The subbasin plans provide an explicit example of the need to base the Program's goals and objectives on science. The Independent Scientific Review Panel (ISRP) found that, even in the best subbasin plans, "the numerical goals for anadromous species are projected from an assumption that all habitat can be modified to comply with Ecosystem Diagnosis and Treatment standards, which seems to be an unrealistic assumption."[7] Other plans suffered because they inadequately considered the dynamic nature of ecosystems and the role of disturbance in shaping aquatic habitats. Plans also omitted the effects of exotic species.[8] The Program might acknowledge this reality with meaningful science-based objectives that are reasonably achievable given the Basin's current conditions.

One dramatic improvement in the Basin is the extent of new mitigation tools available for protecting and improving habitat. For example, some emerging mitigation tools offer innovative market-based opportunities that could cost-effectively expand the Program's stakeholder support, reach more areas of the basin, and recover more ecosystems.[9] When the Program began, buying fee title to land immediately became the most popular means used to protect habitat. Buying land continues to be popular but isn't necessarily the most economic and efficient mitigation approach.

Today, innovative emerging markets offer mitigation tools and partnerships that didn't exist even 10 years ago.[10] For example, the region has an untapped potential for carbon and other ecosystem service markets. The Pacific Northwest's native forests accumulate carbon above and below ground better than almost any other terrestrial ecosystem. Unlike most other timber-producing regions, industrial forests consist of native species that require few inputs for successful timber production. The same acre of forest can and does produce multiple benefits: timber, carbon storage, habitat, water filtration and storage, scenic vistas, recreational opportunities—and fish and wildlife. This offers a tremendous competitive advantage in global forest carbon markets, allowing enterprising partners, for example, to store additional carbon through extending tree harvest rotations and retention, while continuing to produce high-quality

[7] ISRP, ISAB, Scientific Review of Subbasin Plans at 114 (document 2004-13) (2004)
[8] *See*, *e.g.*, *id*. at 86 (Imnaha subbasin plan here effects of exotic species are "largely missing").
[9] For an excellent summary of creative habitat protection tools, see Sarah Vickerman, Stewardship Incentives: Conservation Strategies for Oregon's Working Landscape (Defenders of Wildlife, 1998). Table 10 provides a comprehensive summary of these conservation tools. http://www.biodiversitypartners.org/pubs/SI/Execsum.shtml
[10] This paragraph borrows heavily from: ecotrust, "The role of forest carbon in a low-carbon future: suggestions for market design of a regional GHG cap and trade system" at 1 (Jan. 28, 2008).

timber and other environmental amenities generated by native forests, including improved aquatic and terrestrial habitat for fish and wildlife.

If the Program can match its expanded all-H scope with innovative partnerships and mitigation techniques, we can increase the Program's depth, breadth, ownership, and effectiveness without substantially increasing costs.

2. Focus BPA efforts on mitigating FCRPS impacts only.

The first Program (1982) and its initial amendments (1984 and 1987) considered the region's entire hydroelectric system, not just the FCRPS. And where they addressed the FCRPS, the first Program and subsequent amendments narrowly construed FCRPS mitigation duties to correspond to its direct impacts.[11]

For example, the Council rejected proposals for amendments that sought BPA funding in tributaries such as the Metolius because they failed "to state clearly which hydropower effects are being addressed and do not document the unmitigated losses attributable to the pertinent hydropower projects."[12] This meant that such proposals would not mitigate FCRPS facilities or impacts so ratepayers shouldn't pay for them. Those versions of the Program held true to the Act's mandate that all the region's hydroelectric projects were to be mitigated as a system and adhered to the principle that electric power ratepayers should pay for mitigating the hydroelectric system only.

BPA supports the Council's efforts to consider the broad basin-wide all-H context in which the Program functions. Whether the Council contemplates an FCRPS-mitigation-related vision, objective, measure, or project recommendation the same threshold question arises: did the FCRPS cause this problem? If not, the Act still allows that there may be appropriate circumstances to consider the recommendation as off-site mitigation or enhancement. But enhancement plays a limited role. As interest in BPA funding for off-site mitigation continues to grow, the Program needs to clarify what "appropriate circumstances" justify ratepayer funding to mitigate impacts not attributable to the FCRPS.[13]

[11] 1984 Program Appendix A, Disposition of Applications at 3.
[12] 1984 Program Appendix A, Disposition of Applications at 6.
[13] 16 U.S.C. §§ 839b(h)(8)(A), (B), (C).

3. Emphasize on-the-ground mitigation activities.

With the Council's guidance, BPA has already completed a tremendous amount of mitigation since the Program's inception over 26 years ago. Progress to date also includes subbasin plans, recovery plans, and mitigation agreements that provide a generally workable understanding of the off-site limiting factors affecting fish and wildlife and the appropriate strategies for addressing them. There remains unfinished work to confirm limiting factors initially identified simply through anecdotal, best professional estimates. Nevertheless, the Program should increase its emphasis on measures that directly mitigate fish and wildlife, with clear strategies for addressing known factors that limit them. Direct on-the-ground actions that implement strategies for addressing limiting factors should rank highest among the Program's priorities.

4. Complement resource managers' plans and activities.

In part as a result from Northwest Power Act directives, and in part response to other mandates, such as the Endangered Species Act (ESA), BPA has entered into dozens of agreements and plans to protect and mitigate fish and wildlife affected by the FCRPS. In addition, recovery plans, conservation strategies, habitat conservation plans, and coordination agreements overlay the entire region. At every level—from its objectives and performance standards to its strategies and measures—the Program should fully consider, complement, and where appropriate integrate these plans and agreements.[14]

The most obvious points for coordination and integration include biological opinions and recovery plans. Equally important, though, are binding agreements found throughout the region which control how certain entities will assist BPA's efforts to implement the Program. For example, Montana, Idaho, and the Nez Perce Tribe have long-term wildlife mitigation settlements with BPA. The Program should not adopt policies or measures that would conflict with commitments the resource managers and BPA made in these very successful agreements. Whether considering policies regarding crediting or operation and wildlife mitigation maintenance funding, any recommendations the Council adopts should honor the existing contractual commitments between BPA and resource managers.

[14] 16 U.S.C. § 839b(h)(6)(A).

Scope of the Program

The first step in amending the Program is to determine its scope, following Northwest Power Act dictates. Threshold questions, ranging from narrow to broad, include:

- Should the Programs goals and objectives focus on *federal hydroelectric* impacts only and how to mitigate them?
- Should the Program's goals and objectives focus primarily on *BPA funding* as a mitigation tool for federal hydro impacts?
- Should the Program's objectives focus on *federal and non-federal hydro* impacts only and how to mitigate them, as specified by the Northwest Power Act?
- Or should the Program engage broader ecosystem objectives for hydro and all other human-caused impacts, across the H's, in which case delineation of respective roles and funding responsibilities would be important?

In BPA's view, the third alternative states the appropriate scope - focusing on hydroelectric impacts only - for the Program according to the Act. The Program, however, has evolved, appropriately given its broad vision and goals, to a scope beyond mitigating the impacts from the federal and non-federal hydroelectric facilities in the Columbia River Basin.

The current scope of the Program—especially the subbasin plans—reflects restoration and recovery objectives and strategies that go far beyond addressing impacts relating to the hydrosystem. These broader recovery goals exceed the mitigation responsibilities the Act created for the hydroelectric system managers and do not define their responsibilities under the Act. Said differently, hydroelectric project impacts are but one of several key limiting factors affecting fish and wildlife in the basin.

At its core, the Program addresses protection, mitigation, and enhancement of fish and wildlife affected by the hydropower system. According to the Act, the Program objectives should address, as a highest priority, *direct mitigation* actions for federal and non-federal hydroelectric project system impacts, such as actions which improve survival at and between the dams through passage improvements and mainstem predator control.[15] If, however, adverse effects on

[15] 16 U.S.C. §§ 839(6), 839b(h)(2)(A)-(B); (h)(6)(E).

fish abundance, due to the dams, remain after taking these *direct mitigation* actions, then *off-site mitigation* such as habitat protection and improvement, and other mitigation actions, such as *hatchery production*, become options in "appropriate circumstances."[16]

On this last point, degraded watershed habitat in the Columbia Basin resulting from the cumulative affects of 200 years of European-American settlement and the current presence of 12 million human beings has and will adversely affect anadromous and resident fish and wildlife populations. Most of these impacts lack any connection to the FCRPS and are not hydroelectric system effects.

The Program, especially through its subbasin plans, begins to address these limitations. However, it is important that the Program not equate these broad Program objectives to BPA or FCRPS mitigation responsibilities. In fact, the Act did not originally contemplate a broad habitat Program, and makes clear that BPA habitat actions must be "in addition to and not in lieu of" mitigation actions required by others, such as land and water users in the tributaries.[17]

If the amended Program follows the 2000 Program in its reliance on BPA for implementation, then the Council should narrow the Program's goals, especially those related to off-site mitigation in tributary subbasins, to reflect a Program scope sized to mitigating for FCRPS impacts only.

In short, BPA supports expanding the Program's scope to broadly guide fish and wildlife mitigation throughout the basin, regardless of what caused the need to mitigate. However, we believe it is essential to clarify three critical points:

1. The Program to address hydro effects under the Northwest Power Act is a subset of this broader effort.
2. The BPA and FCRPS actions in the Program are a subset of the broader hydro actions.
3 Actions in the tributaries are offsite mitigation, a subset of FCRPS mitigation strategies, and the Program should include them only after

[16] 16 U.S.C. §§ 839b(h)(5), (h)(8)(A).
[17] 16 U.S.C. §§ 839b(h)(10)(A). And where the Program provides for coordinating FCRPS mitigation with additional enhancement measures "to deal with impacts caused by factors other than the development and operation of electric facilities and Programs," that additional mitigation should follow from agreements with other "appropriate parties providing for the administration and funding" for those measures. 16 U.S.C. §§ 839(b)(h)(8)(C).

taking into account the mitigation benefits of direct passage improvements and predator management and hatchery-based mitigation.

An Ecosystem-Based Program Implemented Through Partnerships

Within the context just described, the Program should continue to rely on its ecosystem-based approach. BPA would like, however, to suggest several very significant refinements.

Science supports basing the Program on an ecosystem approach. Therefore, the Program's strategies and measures should be aimed at an ecosystem level. Adequate stream flows, appropriate water temperatures, intact riparian and upland habitats aren't ecosystem attributes that only particular species need—they're the attributes that make a properly functioning ecosystem. The Program therefore needs to move away from a construct that separates out different habitat mitigations for artificially grouped species (such as resident fish and wildlife in the mainstem having different habitat needs from anadromous fish), and towards an ecosystem-oriented focus.

To engage mitigation on an ecosystem basis more fully, the Program could offer more detailed guidance for forming the partnerships. Such partnerships are important for implementing work that others are responsible for or for which there are shared responsibilities, such as mitigation that deals with impacts caused by factors other than the development and operation of hydroelectric dams.[18]

Once the Program moves off-site—that is, away from the hydroelectric dams and their direct impacts to fish and wildlife—then its scope and guidance should reflect an implementation framework that encourages the entities responsible for the off-site impacts to fulfill their mitigation responsibilities. The Act contemplates BPA involvement with off-site mitigation. But it conditions ratepayer contributions to "appropriate circumstances"[19] and expects that agreements with the appropriate parties will guide the administration and funding of those measures.[20] To effectively engage this broader vision, the Program should institutionalize partnerships and incentives as the cornerstone of its off-site mitigation guidance.

[18] 16 U.S.C. §§ 839(b)(h)(8)(C). Past Programs embraced this approach. *See*, *e.g.*, 1987 Program at page 25 (section titled "Contributions from others").
[19] 16 U.S.C. §§ 839b(h)(5), (8)(A).
[20] 16 U.S.C. § 839b(h)(8)(C).

BPA has many mitigation partners helping it to implement its share of the Program. Generally, these partnerships need to continue. But to meaningfully embrace the Program's broad goals that encompass all four Hs, and to implement subbasin plans where FCRPS dams often are not listed as limiting factors, the Program should *require* partnerships and agreements—as recognized in the Act. These partnerships should engage the entities that caused the impacts or are responsible for mitigating them.[21]

The Council is in a position to facilitate these partnerships by helping pull together the agencies that manage, regulate, and protect land and water resources for each state, and by helping them improve their coordination with each other and with federal and tribal resource managers and regulators. The Council could further provide a clearing house for finding appropriate funding sources for specific projects or initiatives. The incentive could be BPA funding for the cost-share that local sponsors often need to bring to grant programs from other entities.[22]

Biological Objectives

The Council bases its Fish and Wildlife Program on a broad framework for fish and wildlife mitigation and recovery within the Columbia River Basin. The current framework includes a vision for the Columbia River, which is intended to define the expected basin-wide outcome of the Program, and a scientific foundation, which is a set of scientific principles that broadly summarize current scientific knowledge concerning ecosystem attributes, processes, and functions applicable to fish and wildlife mitigation and recovery within the Basin. The biological objectives describe the physical and biological changes needed to achieve these outcomes.

BPA encourages the Council to continue using these same formal elements to structure the Program. The Program, however, should elaborate upon the

[21] 16 U.S.C. § 839b(h)(8)(C).

[22] As the Council noted recently, "the fact that [BPA's 2007-2009] projected budget commitment cannot fund every project proposal, or even every project proposal that passes ISRP review and can be connected to a measure in a subbasin plan or other part of the Program, is no proof that the funding commitment is inadequate, or even a fact of any relevance. The Power Act does not promise unlimited resources." Letter from Doug Marker, Council Fish and Wildlife Division Director, to Bill Maslen, BPA Fish and Wildlife Division Director (2007-2009 Recommendation) at 19 (Nov. 20, 2006).

linkages between the objectives and principles on the one hand and the strategies and measures on the other

Consistent with the ISAB's review of the 2000 Program's objectives,[23] we suggest a clarified framework that includes the following elements:

- vision,
- scientific principles with expanded interpretations to provide specific guidance for developing biological objectives,
- the biological objectives (which should represent a melding of the objectives for biological performance and environmental characteristics),
- strategies and actions as a means of applying specific principles, and
- a means of monitoring and assessing whether the strategies and actions accomplish the objectives.

BPA recommends that the amended Program incorporate the objectives, performance standards, and metrics from the biological opinions and recovery plans covering the FCRPS. These represent the regulatory resource managers' views concerning the best available science. These include the results from judicially monitored settlements and collaborative processes that included public involvement. Specifically, the Program's biological objectives should be informed by the Viable Salmonid Population (VSP) paradigm. Broader province-level objectives, if adopted, should build on recovery planning objectives and consider all VSP parameters.

Basin-scale Biological Objectives

BPA recommends the following changes to the Program's biological objectives.

- Move away from relying on the current basin-wide numerical objectives for anadromous fish populations. The ISAB found that it is not possible to assess whether the numerical objectives for biological performance listed under anadromous fish losses and the timeframes for achieving the objectives are realistic because no quantitative or qualitative justification of the objectives and timeframes is provided.[24]

[23] ISAB, Review of the Biological Objectives in the 2000 Fish and Wildlife Program (document 2001-6) (Jul6 27, 2001).

[24] The Ninth Circuit Court had a similar view when it reviewed the Program. It concluded that the goal of doubling the population of anadromous fish was "an untelling policy statement." *Northwest Resource Information Center v. Northwest Power Planning Council*, 35 F.3d 1371 (1995).

- Avoid attempting to quantify FCRPS mitigation responsibilities in terms of absolute numbers of returning adult salmonids.

- The current Program incorporates a goal of restoring "the widest possible set of healthy naturally reproducing populations of salmon and steelhead in each relevant province by 2012. Healthy populations are defined as having an 80 percent probability of maintaining themselves for 200 years at a level that can support harvest rates of at least 30 percent." BPA did a population viability analysis to estimate the magnitude of salmonid population survival improvements that would be needed to achieve this goal.[25] For many of the populations we have modeled, the needed survival improvements significantly exceed the improvements that would be needed to achieve viability and full recovery of these populations. We doubt whether such broader improvements are possible within any timeframe, especially within the next four to ten years. BPA recommends dropping the quantitative description of a healthy population.

- Although the 100-200 year long-term objectives include "full mitigation" for losses of anadromous fish, it is not clear what the term "full mitigation" means or whether "full mitigation" is feasible in the face of regional population and economic growth, much less the uncertainty of climate change. Furthermore, the ISAB was not aware of any salmonid fishery in which the biological objective of maintaining native fish species at "near historical abundance" while allowing relatively high harvest rates of hatchery fish has been achieved.[26]

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[25] *See* Appendix, Section A.

[26] Other technical reasons that the ISAB found for eliminating numerical population objectives are that:

1) the Ecosystem Diagnostic and Treatment model (EDT) does not appear to be able to determine whether biological objectives are accomplishable;
2) EDT is an equilibrium model that assumes that once a biological response to a change in an environmental attribute occurs, the magnitude of the response thereafter remains constant, and
3) EDT artificially controls uncertainty in its predictions by assuming the modeled ecosystem is at a dynamic equilibrium within and between the component ecological communities and the environmental factors affecting them. Predictions outside this equilibrium would require detailed information about the populations we are interested in, the other species in the communities that may affect the productivity of those populations, and the various environmental factors potentially affecting them. The

- Use the provisional objectives in Appendix D of the 2000 Program. The ISAB found them scientifically sound, more comprehensive, and far more appropriate for basin-wide application than the Program's current numerical population objectives for biological performance (especially those objectives related to anadromous fish).
    - In addition, adopt positive trends in abundance and life stage survival improvements consistent with the FCRPS BiOp performance targets and adaptive management framework.[27]

The Region Lacks the Information and Scientific Consensus to Quantitatively to Define BPA's Mitigation Responsibilities Numerically

BPA notes the attempts to quantitatively define its share of the Program's broader-scale biological objectives. But current scientific knowledge does not adequately support these efforts. Ultimately any such exercise relies in large part upon expert opinion. And with regard to Columbia River salmon, expert opinions differ widely on many key scientific issues.

For example, a recent effort along these lines was undertaken by the remand collaboration's Policy Working Group (PWG) formed under the ongoing remand of the 2004 FCRPS Biological Opinion. Over half the committee members that undertook this effort came from agencies and tribes engaged in regional fish and wildlife management. The so-called Framework Work Group attempted to define relative shares of human-caused mortality for listed populations of salmon and steelhead in the interior Columbia River Basin. The draft survival "gaps" developed by the Interior Columbia River Technical Recovery Team were then allocated among the different sources of human-caused mortality. This assessment was used to "help establish the relative expectation of the FCRPS for recovery."[28]

The effort, however, suffered from some of the shortcomings one would expect. Key differences of scientific opinion over the magnitude of hydrosystem-caused latent mortality and the appropriate treatment of harvest were never resolved. In addition, subsequent analysis in the Action Agencies' Comprehensive Analysis and NOAA Fisheries' draft Biological Opinion called into question

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region lacks this information in virtually all subbasins, and it would take decades and millions of dollars to develop.

[27] Appendix, Section B.
[28] Draft report of the PWG's Framework Work Group, April 17, 2006.

some of the Framework Work Group's conclusions. For example, the Group's draft report concluded that hatchery impacts were relatively low for Upper Columbia steelhead. Yet NOAA's draft Supplemental Comprehensive Analysis concluded that hatchery Programs likely have contributed substantially to the low productivities of these populations. The Comprehensive Analysis concluded that productivity improvements of as much as 200 percent were possible as a result of successful hatchery reforms, an estimate that differed significantly from the Framework Work Group's estimate.

Applying the Basin-scale Objectives to Provinces and Subbasins

As general guidelines, the ISAB found that the strategies in the Program could be more helpful to subbasin planners than the biological objectives because they outline specific approaches to different issues. As stand-alone recommendations, they appeared to be consistent with current science, although there remains some insufficient linkages among strategies across the categories (i.e., artificial production, harvest, habitat, hydropower, wildlife, oceans, research and monitoring).

The ISAB also expressed concern about the adequacy of the operational linkages among vision and principles, basin-scale objectives, and subbasin-scale objectives, strategies, and actions. The scientific principles "are too general to provide specific guidance for development of objectives, and constraints imposed by the principles are not clearly specified. The objectives for biological performance are unclear, not well justified, and not especially consistent with the principles."[29]

Recommendation

Ultimately the ISAB found that "[t]he provisional objectives for environmental characteristics are scientifically sound, consistent with the Council's science foundation and recommendations in Return to the River (ISG, 2000), and are applicable basin-wide."[30] Consequently, BPA recommends that the Council replace the Program's current vision, goal, and objectives with the provisional objectives in Appendix D of the 2000 Program, and revise the provisional objectives as the ISAB advised.

[29] ISAB, Review of the Biological Objectives in the 2000 Fish and Wildlife Program at page 14.
[30] *Id.* at page 3.

BPA recommends further that in the event the Council seeks to include province-level biological objectives in the Program, then the Program should clarify that those province-level biological objectives cannot and do not define and BPA's mitigation responsibilities under the Northwest Power Act.

Global Climate Change

Authoritative reports increasingly address the prospects and implications for climate change in the Pacific Northwest and the Columbia River Basin. The FCRPS Action Agencies recognize that climate change could pose an additional threat to the survival and recovery of listed species. Consequently, these agencies recently proposed enhanced steps to adapt their mitigation and recovery efforts in ways to ensure they remain effective despite impending climate changes.

Given that the concept of man-caused climate change has only recently been the target of in-depth investigation and monitoring, it is hard to know with any certainty the exact nature of effects to expect. However, the Independent Scientific Advisory Board's recent report discusses the range of general temperature and hydrologic changes, and any trends which might be expected in the future due to a large scale, human-caused change in climate.[31]

Steps the FCRPS Action Agencies Plan to Take to Address Climate Change

Humans contribute to global climate change through their production of "greenhouse gases," such as carbon dioxide. Yet the FCRPS has allowed the region to avoid the construction of significant amounts of fossil-fuel fired generation – the type of generation that gives the rest of the electric utility industry such a high "carbon footprint."

If the FCRPS dams were removed, or their power production more tightly restrained, greenhouse gas emissions in the Northwest would likely be exacerbated by the consequent switch to higher impact fuels (e.g., coal and natural gas). Thus, the FCRPS helps to prevent production of green house gases in the Pacific Northwest as compared to levels associated with electricity production in the rest of the United States. The dams therefore ameliorate the causes of climate change.

[31] ISAB, Climate Change Impacts on Columbia River Basin Fish and Wildlife (document 2007-2) (2007). See Appendix, Section C, for BPA's summary of the ISAB's findings.

The Federal Action Agencies' recent Updated FCRPS Proposed Action commits to the following actions to help address FCRPS impacts to fish and wildlife in response to a changing climate: dry year strategy, flow variation and refill, temperature control, predator management, and habitat protection and improvement. The agencies will focus their habitat actions for ESA listed anadromous fish in areas that climate change will most likely affect adversely.

Recommendation: The Program should adopt an adaptive management structure with checks and balances that include monitoring to performance standards and targets, continued collaboration and oversight, adaptive actions and contingencies that are rigorous enough to be responsive to the real time environment of the operating hydrosystem as well as allowing sufficient flexibility to adapt to the now uncertain effects of global climate change.[32]

Human Impacts on Fish and Wildlife

The ISAB also produced a report on human population impacts to fish and wildlife.[33] The report projects that the population of the Pacific Northwest, encompassing the Columbia River Basin, is expected to grow between 50 million to 100 million people by the end of the century (330 percent to 667 percent increase). The report also noted that human population and its pattern on the landscape significantly impacts fish and wildlife. BPA advocates considering this broader potential impact and the ways to address it throughout the Program. In doing so, however, the Program should respect the limits that the Act imposed on BPA's mitigation responsibility—to mitigate for the FCRPS only, not all human impacts. The value from integrating human population growth effects into the Program will be that the Council can proffer its guidance while fully considering the greater context that can dictate whether a mitigation action succeeds or fails.

Incorporating Human Populations into Fish and Wildlife Mitigation Planning

To protect remaining healthy native stocks of Pacific salmon and steelhead, and enhance and protect the habitat necessary to sustain those healthy populations, the FCRPS Action Agencies incorporated many of the ISAB's recommendations

[32] For examples see FCRPS Action Agencies, Biological Assessment Chapter 2, Adaptive Management, Contingencies and Oversight.
[33] ISAB, Human Population Impacts on Columbia River Basin Fish and Wildlife (document 2007-3) (2007).

for taking action to limit the impacts on natural resources due to changes in human population. BPA urges the Council to do the same with the new Program amendments, including:

1) Stakeholder involvement: landowner participation should be a means to vest local residents in the process and craft a common vision for a watershed.

2) Scientific basis for decision making: consider human population growth within the entire range of natural resource planning processes.

3) Investigate alternative development scenarios: focus actions on "protecting the best," and assess the range of new market-based protection mechanisms for cost effectiveness and permanency of protections for fish and wildlife.

4) Evaluation and monitoring to enable adaptive management: identify and adopt ecological and landscape metrics that are robust predictors of the impacts of human development.

Strategies and Tools

The ISAB also recommends a number of specific strategies: build from strength; increase surveillance and curb movement of invasive species; create wild salmon refuges; and protect habitat that supports diverse fish and wildlife populations.

Recommendation: The Program should adopt the following strategies to protect desirable habitat and promote healthy fish and wildlife populations:

- Test innovative, market-based habitat protection and improvement tools.
- Secure settlement and land management agreements; habitat conservation plans.
- Make policy modifications, and, where necessary, legislation to create more opportunity for the transfer of development rights; tradable environmental credits; certification Programs such as "Salmon Safe."
- Establish salmon strongholds to protect remaining healthy wild stocks before they are threatened.
- Develop a regional strategy for a cost-shared fish and habitat monitoring program to track regional performance objectives and

limiting factors needed to inform adaptive management of human impacts.

In addition, the Council could work with states and their regulatory bodies to consider adopting models for policies that address the following issues:

- Address urban containment to help limit exurban sprawl.
- Explicitly address population growth in planning and prioritization of projects at the subbasin scale.
- Protect areas that will restore headwater sources of cool water in warm streams.
- Provide incentives to private landowners to:
  - protect fish and wildlife habitat,
  - not develop prime, diverse habitat areas,
  - avoid barriers to fish and wildlife movements,
  - conserve water,
  - modify the timing and quantity of irrigation withdrawals,
  - eliminate withdrawals of shallow groundwater in the vicinity of salmon bearing streams.
- Develop emerging markets for ecosystem services.
- Coordinate with environmental agencies outside the Columbia River Basin if their mandates affect Basin habitat.

The Mainstem

In the last 15 years, FCRPS Action Agencies significantly changed dam configuration and operations in response to the Council's Program, biological opinions, and judicial orders. They retrofitted the hydro system in ways that its designers and builders could not have contemplated. In modifying these physical assets, the agencies pushed the limits of cost-effectiveness and technical feasibility. They believe their efforts make it possible to have clean, renewable energy, irrigation, navigation and flood control as well as a productive, healthy ecosystem for salmon and other species. And, these modifications are consistent with the Northwest Power Act's express purpose and priority to first mitigate on-site.

As the Council begins to amend the parts of the Program that addresses the mainstem, BPA encourages it to consider how different the FCRPS is today compared to just 15 years ago.

Improved conditions on the hydro system are contributing significantly in the effort to recover threatened and endangered stocks. Progress in fish survival on the hydro system since 1994 is measurable:[34]

- For juvenile Snake River fall chinook making their way through the system of dams and reservoirs, survival has improved significantly. (Biological studies at Bonneville Dam indicate Corner Collector survival is near 100 percent).

- Today, with eight dams, survival is equivalent over the same length of river to what it was in the 1960s before the four Lower Snake dams existed.

- Adult fish survival through the dams is about 98 percent per dam, approximating pre-dam natural river conditions.

- Recent juvenile salmonid travel times and passage rates are similar to those during early development of the FCRPS when fewer dams were in place and the Snake River was free flowing.

- Transported Snake River steelhead juveniles generally tend to survive to adulthood at higher levels than their in river counterparts, at times returning as adults to Lower Granite Dam in numbers two-four times greater than fish that migrated in river as juveniles.

- Surface collection and dam passage improvements at lower Columbia River dams in combination with improvements at the private dams on the Mid-Columbia are improving survival for Upper Columbia River stocks (e.g., Rocky Reach surface collector has improved passage survival of listed stocks).

- In the last five years, the number of adult chinook salmon returning to fresh water has reached the highest level since recordkeeping began more than 60 years ago.

With a growing understanding of the needs of the fish since the early 1990s, the FCRPS Action Agencies have adapted every phase of hydrosystem operations to improve fish passage. Actions to date include:

[34] FCRPS Action Agencies, Biological Assessment at section 1.2.3 pages 1-8 to 1-15 and Appendix A ("Overhaul of the System").

- Improving timing and increasing volume and duration of spill at Snake River and lower Columbia dams.

- Reducing winter generation, thereby keeping reservoirs at higher levels to meet spring and summer flow targets.

- Retaining enough water in storage reservoirs by June 30 to augment summer flows for fish.

- Installing removable spillway weirs, which have been installed at five dams and other surface passage improvements at two others. Such improvements are scheduled for installation at all mainstem dams by 2009.

- Innovative flood control operations at reservoirs to provide more spring and summer flow.

- Negotiating with Canada to find mutually acceptable ways within and beyond treaty obligations to use the limited available storage to shape water to help provide fish flows in the United States.

In concert with the physical improvements, the agencies have re-written the FCRPS operating book to fulfill their stewardship role for the region's fish and wildlife. The potential electrical value of flow and spill operations for fish in now equals more than 1,300 average megawatts. That's approximately 15 percent of the capability of the federal system and equal to the power requirement of a city the size of Seattle.

The forthcoming FCRPS biological opinions and long-term agreements capture most of the objectives and measures from the 2000 Program and 2003 mainstem amendments. They include, among other actions:

- the protection and enhancement of mainstem habitat, including spawning, rearing, resting and migration areas for salmon and steelhead and resident salmonids and other fish;
- system water management;
- passage spill at mainstem dams;
- adult and juvenile passage modifications at mainstem dams;
- juvenile fish transportation;

- adult survival during upstream migration through the mainstem;
- reservoir elevations and operational requirements to protect resident fish and wildlife, such as changes in reservoir operations in Montana;
- water quality conditions; and
- research, monitoring and evaluation.

Integrating Northwest Power Act and ESA Planning and Implementation

In May 2008, NOAA Fisheries will issue its latest biological opinion on FCRPS operations, and later this summer an opinion on federal project operations in the Willamette Basin. The U.S. Fish and Wildlife Service's 2000 biological opinions on bull trout and white sturgeon remain in place, although pending litigation may require changes in the 2006 sturgeon and bull trout opinion. The hydrosystem measures in these opinions run to hundreds of pages of detail and hundreds of measures on system configuration, river flows, reservoir management, passage improvements, spill, juvenile transportation, predator management and more. These measures are built on foundations developed in the Council's Program over the last 20 years. In addition, those measures and actions in NOAA's FCRPS opinion come in large part from a court-ordered Remand Collaboration process with participants including many of the regions' resource managers, individual states, as well as some Council members and staff.

Adaptive Management

Regarding the ESA, BPA supports the Program continuing to integrate the closely related goals in the Northwest Power Act and the ESA. In developing its biological assessments, proposed actions, and positions in section 7 biological opinion consultations—for the mainstem FCRPS, Libby, and the Willamette—BPA worked (and is working) with the other FCRPS Action Agencies and the regulatory agencies to incorporate considerable flexibility into the final biological opinions. As with the Program, some actions under the biological opinions require adaptive management because the results and effectiveness cannot be guaranteed in all instances. For example where, a habitat strategy exceeds expected performance, the agencies may seek to increase its use beyond the initial prescription.

Recommendation: To avoid premature obsolescence, the Program needs to adopt a flexible approach. Otherwise, it risks constantly needing updating to

remain true to the plans and agreements between resource managers, regulators, and hydroelectric dam owners and operators. Consequently, measures supporting strategies and initiatives, but not necessarily specific projects or actions, will be more durable and useful over time.

Hydrosystem Operations for Non-Listed Species

FCRPS managers now work within a highly constrained system. Biological and physical parameters constrain and drive system operations on a year round basis. Few if any remaining untried operations or modifications promise biologically significant and/or cost-effective means to improve salmon and steelhead survival. This also leaves little room for additional changes whether for anadromous fish or resident fish or wildlife.

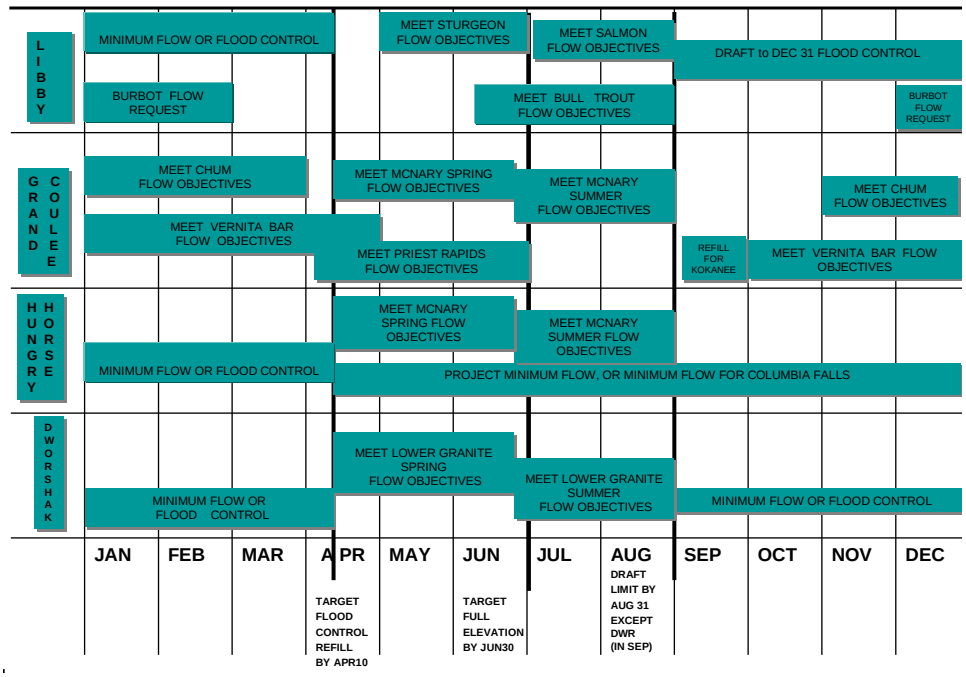
Beginning in 1995, the FCRPS Action Agencies began using the headwater storage reservoirs to supply water for salmon traveling during the summer in the lower Columbia River. Initially the agencies timed the water releases to fill in the July and August recession in natural flows. These actions may have benefited salmon migrating at the end of the migration season, but providing the water downstream reduced the productivity of the headwater rivers and reservoirs. Subsequent efforts tried to balance upper river resident fish needs with lower river anadromous fish needs by levelizing the flow over the entire period. To further reduce these impacts to headwater resources, the state of Montana has proposed releasing less water and extending the period of withdrawals over an additional month.

Other mitigation measures implemented for resident fish in the upper river including the following:

- increasing the minimum flow at Hungry Horse Dam;
- eliminating power peaking;
- fertilizing the Kootenai River, Kootenay Lake and Arrow Reservoir; and
- implementing a VARiable Q (VARQ) flood control procedure.

To inform the ongoing FCRPS ESA consultations, the Corps prepared the following table that broadly shows the current system operational constraints.

FISHERY OPERATION TIMELINE



If FCRPS operations demonstrate significant detrimental biological effects on non-listed fish—as a result, for example, from unexpected equipment failures or other conditions—opportunities may arise to take reasonable actions to aid them for brief periods of time. But when proposed operations for non-listed fish conflict with operations for ESA-listed fish, operations that comply with the ESA must take priority.

Recommendation: BPA encourages the Council to adopt Program provisions requiring consultation with state and federal fish and wildlife agencies and tribes, the ISAB, and FCRPS Action Agencies before proposing to adopt hydrosystem actions or survival performance standards for non-listed species.

Dam Breaching

BPA recently provided current analysis regarding the lower four Snake River dams. The FCRPS Action Agencies did not include dam breaching in their proposed action for several reasons.[35]

[35] BPA Fact Sheet, Why lower Snake River dam removal is not in the draft 2007 BCRPS BiOp (Oct. 2007). For additional documentation supporting these facts, go to: http://www.bpa.gov/corporate/BPANews/Perspective/2007/Snake_River_Dams/ .

- Congress authorized power production as a purpose of the dams, and breaching one or more of them would defeat that purpose.
- Only Congress can authorize dam breaching.
- Even if breaching the dams would benefit salmon, at most it would affect only four of 13 listed species.
- Breaching the dams would cost up to $550 million annually.
- The dams provide an emission-free power source that does not contribute to global climate change.

Recommendation: For the purposes of planning for this Fish and Wildlife Program, and particularly the hydrosystem portion of the Program, the Council should continue to assume as it did in the 2003 Mainstem Amendments that breaching mainstem dams currently lacks legal, economic, or political feasibility and cannot occur during the five years before the Council will amend the Program again.

Delayed Mortality

When considering the 10-year Cumulative Survival Study report,[36] BPA noted that when the performance measure for "differential mortality" is corrected for the extra migration of upstream stocks, there is little or no evidence of differential hydrosystem mortality for hatchery chinook salmon.[37] More obliquely, but still to the point, the ISAB recently found that:

> The ISAB's Latent Mortality Report (ISAB 2007-1) expresses in detail the concerns about interpretation of cause-effect from the upriver–downriver statistical comparison and notes also the lack of a needed appropriate baseline, the damless reference, in the context of attempts to measure latent mortality:
>
> > *"Although the discussion concerning interpretation of stock and recruitment analyses, environmental covariates, and the value of upstream (Snake River) versus downstream (John Day River and Carson hatchery) continues (Hinrichsen pers comm, Paulsen and Fisher in review, Schaller*

[36] Fish Passage Center, Comparative Survival Study Ten-Year Retrospective Analysis Report (May 30, 2007).
[37] Letter from William Maslen, BPA Fish and Wildlife Division Director, to the Fish Passage Center re: BPA comments on the Comparative Survival Study Ten-Year Retrospective Analysis (July 24, 2007).

and Petrosky in review), the ISAB questions whether this continuing discussion is productive. (ISAB 2007-1, p.16)"
"One thing that is clear is that we are not able to estimate latent mortality for the damless reference condition. (ISAB 2007-1, p.18)"

In the 2006 Comparative Survival Rate Study (CSS), the ISAB (ISAB 2006-3, pg. 12) recommended that more lower-river sites/stocks be included in the analysis. We now doubt that there are a sufficient number of appropriate downriver wild stocks available to make a meaningful comparison. The further downriver one goes in seeking more wild stocks, the more likely there will be climatic, watershed, habitat, and life history differences between the Snake River and lower river sites, thus exacerbating the physiographic and habitat differences between those sites. Finally, even if statistical differences between upstream and downstream stocks were found with increased sample size, it would be extremely difficult to determine the actual causes of the difference. All differences between upriver and downriver stocks would be candidates for causal factors, and, as noted above, it seems impossible to adequately control or rule out all alternative causes.[38]

Recommendation: The Program should not resuscitate the delayed mortality issue. Due to the inability to reproduce these results using accepted modeling and analytical procedures the CSS report's findings lack the scientific rigor and support to authoritatively guide hydrosystem mitigation or management.

Nonfederal Hydroelectric Projects

To substantiate its all-H approach, the Council should integrate the Federal Energy Regulatory Commission's (FERC) mitigation planning for nonfederal projects into the Program. The Northwest Power Act requires this integration in its directive that the Program plan mitigation for the Basin's hydroelectric dams "as a system,"[39] and past Programs proactively fulfilled this requirement.[40]

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[38] ISAB/ISRP, ISAB and ISRP Review of the CSS Ten-Year Retrospective Report (doc. 2007-6) (Nov. 19, 2007).
[39] 16 U.S.C. § 839b(h)(1)(A).
[40] *See*, *e.g.*, Council, 1982 Program at § 404 (Anadromous Fish Downstream Migration), § 704 (Wild, Natural, and Hatchery Propagation), § 804 (resident Fish); 1984 Program (same section numbers as in 1982 Program); 1987 Program § 603 (flow and spill measures for "all Columbia River and Snake River dams); 1987 Program § 403 (passage), § 903 (resident fish), § 1000 Table 3 (wildlife).

Recommendation: The Program needs to reflect three steps to make system-wide mitigation planning a reality.

- Identify all the nonfederal hydroelectric projects in the region regulated by FERC.
- Review the Program guidance for the FCRPS and compare it to FERC's directives in the licenses it issues to nonfederal hydroelectric projects. Coordinate the goals, objectives, and strategies between federal and nonfederal mitigation efforts.
    - Work to standardize the biological objectives and metrics for research, monitoring, and evaluation.
    - Coordinate predator control efforts in hot spots where the interests of the FCRPS and middle Columbia River public utility districts overlap.
    - Consolidate data management protocols and physical storage to facilitate system-wide research, monitoring, and evaluation.
    - Explore partnership opportunities between federal and nonfederal project managers and operators. Seek opportunities to improve mitigation effectiveness by coordinating actions so they increase habitat diversity, species diversity, and cost-effectiveness. For example, coordinate habitat protection efforts to create larger habitat strongholds, or consider expanding existing hatcheries to accommodate new production initiatives.

Research, Monitoring and Evaluation

Research, monitoring and evaluation in the Program provide information that supports effective planning, implementation, and adaptive management and that demonstrates accountability in effectively meeting Program biological objectives. A common RM&E structure, vocabulary, and strategies have emerged and are being coordinated through the ongoing 2008 FCRPS biological opinion process, and through regional RM&E and Data Management collaboration forums.

BPA recommends that the Council update the RM&E portions of the Program to incorporate the following four fundamental advancements.

First, include a framework structure based on ISAB recommendations and that incorporates the most recent advances from the FCRPS Action Agencies' Biological Assessment and Comprehensive Analysis.[41]

- Programmatic Level RM&E Objective with Key Management Questions to help guide lower level strategic management questions, information needs and strategies
- Standard Terminology for basic types of Monitoring and Research (e.g., Status and Trend Monitoring, Action Effectiveness Research, Critical Uncertainty Research, Project Implementation/Compliance Monitoring).[42]
- Common Strategic Framework Categories
- Strategic Level Management Questions with associated RM&E Strategies

Second, RM&E should target information that helps to answer key management questions that are critical to effective planning, implementation, and adaptive management. This information will also help refine more explicit statements of RM&E strategies, support more targeted RM&E solicitation, and facilitate project selection and prioritization processes. The following high level management questions provide a basis for the needs and priorities of regional RM&E, of which the Program is a part.

1. *Are we meeting biological and Programmatic performance objectives established within the Columbia Basin Fish and Wildlife Program, FCRPS BiOp and ESA Recovery Plans?*

2. *Where objectives are not being met, what factors are limiting our ability to achieve performance standards or objectives?*

3. *What is the effectiveness of different hydro and offsite mitigation actions in addressing these limiting factors?*

4. *Is research and monitoring information accessible to the region and compatible with regional standards and protocols for monitoring, data collection and access?*

5. *Are actions being implemented and accomplished as proposed?*

[41] The FCRPS Action Agency Biological Assessment for FCRPS operations includes a comprehensive set of RM&E management questions and strategies and sub-strategies. For brevity, these recommendations summarize the agencies' approach. Please consult the Biological Assessment for a full description of the agencies' RM&E plan, and their associated Cumulative Analysis for the scientific support for it.
[42] See Appendix, Section D, Standard Definitions of the Types of RM&E.

Third, RM&E should align with regional collaborative efforts for standard and compatible monitoring and data management approaches that support both Program and Pacific Northwest regional information sharing and networking. This will provide cost efficiencies, higher quality and quantity of information, better connectivity of RM&E projects, and further cost sharing agreements and collaborative monitoring efforts across the region.

Fourth, RM&E strategies for fish population and habitat status and trend monitoring need to be collaboratively developed regionally. This monitoring information is a shared responsibility. Where biological opinions or agreements with resource managers do not already cover the needed monitoring, the Program should require cost-sharing agreements among appropriate entities.

Fish Population Status Monitoring: Anadromous and resident fish populations need monitoring to answer fisheries and FCRPS management questions. The status of fish populations are a result of the combined effects of hydro and non-hydro conditions, and therefore this monitoring information is a shared responsibility with other regional federal and state entities. BPA hopes the Program recognizes its own past precedent, and the partnerships developed over time between BPA and fisheries managers, to encourage shared monitoring responsibilities.[43] Encouraging cost sharing and collaborative monitoring efforts will solidify more productive working relationships.

Hydro RM&E: Adopt strategies that provide information important to management questions regarding tracking fish performance objectives, identifying limiting factors, and assessing action effectiveness within the FCRPS. Ensure that these monitoring and research strategies complement the strategies and needs in the Corps' Anadromous Fish Evaluation Program.

Tributary Habitat RM&E: Identify habitat conditions that limit fish and wildlife productivity, and evaluate the effectiveness of off-site habitat actions. An ongoing planning, adaptive management and performance evaluation of habitat actions will require a combination of broad, regionally coordinated and cost-shared status and trend monitoring with more localized, reach-level project effectiveness research, and intensively-monitored-watershed research. In

[43] Council, 1984 Fish and Wildlife Program, Appendix B (Council Response to Comments) at 15 (rejecting fisheries manager request for BPA to fund baseline escapement data on anadromous and resident fish, the Council "concluded that gathering escapement data is a traditional fishery management agency responsibility").

addition, basic project implementation monitoring will be needed as part of these assessments. The Program should facilitate standardized information collection across the Pacific Northwest region for comprehensive assessments.

Estuary and Ocean RM&E: Considerable salmonid mortalitiy occurs in the estuary and ocean, yet it is the least understood life history stage. The Program should support ongoing partnerships to monitor a broad range of estuary physical and biological metrics. These metrics will help explain the relationships between different estuary habitat actions, the environment, and the survival and productivity of salmonids.

Harvest RM&E: The Program should support fisheries managers in their efforts to resolve uncertainties regarding harvest rates, incidental take, and illegal harvest to help refine estimates of hydro upstream survival performance. In addition, critical uncertainties remain regarding selective fishery methods and the feasibility of genetic stock identification monitoring techniques.

The Program should also support development and evaluation of terminal selective harvest gear and methods that would facilitate implementation of HSRG recommendations on controlling numbers of hatchery-origin fish on the spawning grounds.

Hatchery RM&E: The Program includes major artificial production efforts, including production, supplementation, and conservation programs supporting both harvest and population viability objectives. The RM&E for these hatchery programs should evaluate the programs' effects, and associated reform actions, on wild fish populations. This RM&E should incorporate HSRG recommendations and the ESA guidance for both FCRPS and hatchery operations.

Predation and Invasive Species Management RM&E: Piscivorous, avian and marine mammal predation significantly reduces fish populations in the Columbia Basin. Predator monitoring and control actions provide an effective mitigation under both the Program and the FCRPS biological opinions, and should be coordinated fully. RM&E to track the status of predation and the effectiveness of predator control actions is critical to the ongoing adaptive management of these complex and dynamic management actions.

Coordination and Data Management: Adaptive management associated with all of the RM&E strategies of the Program is highly dependent on accessible and well documented information that follows regionally accepted and understood standards and protocols. The Program should continue to facilitate merging the coordination in the ongoing 2008 FCRPS BiOp process with the regional RM&E and Data Management collaboration forums such as the Pacific Northwest Aquatic Monitoring Partnership, the Northwest Data Network, and the Executive Summit on Information Sharing.[44]

Project Implementation and Compliance Monitoring: Project level monitoring provides a key component adaptive management. This monitoring helps insure projects are implemented and functioning as proposed and that they continue to function as expected over time. This information helps assess achievement of programmatic level objectives, but is also essential information to designing action effectiveness studies and relating actions to expected action effects. This information collection will require project level implementation monitoring and independent post project auditing of the ongoing functionality of certain types of habitat projects (compliance monitoring).

RM&E for Resident Fish

- The ISRP recommends the region select focal species that will enable project effectiveness evaluations.
- The ISRP recommends that the region, presumably resource managers, determine relative benefits of flow augmentation to survival of downstream migrating juvenile salmon versus associated reduction of production of resident fish in the reservoirs.
- Fisheries managers should prohibit new exotic freshwater species of any kind from being introduced anywhere in the Basin and expansions of such populations should be halted.
- The impact of American shad on anadromous fish should be assessed.

RM&E for Wildlife

- Per ISRP recommendations, explore least-cost means that document species response to habitat acquisitions and improvements. When available, rely on existing data sources such as Audubon bird counts, game harvest surveys, or field work produced in academia.

[44] *See* Appendix, Section E, for more detailed coordination definitions and recommendations.

- To facilitate better decisions about allocating limited funds, evaluate the biological and economic costs and benefits of active and passive management practices and compare these with the costs and benefits of land acquisition or protection.

Subbasin Plans

Subbasin plans covering the entire Basin looked at all human impacts, not just hydroelectric impacts. In keeping with the Act's edict that ratepayers should pay for mitigating the hydrosystem only, as well as the direction to base off-site mitigation for non-hydro impacts on agreements with the entities responsible for those impacts, BPA asks the Council to adopt the following recommendations. These recommendations follow from the ISRP's subbasin plan review.

- Incorporate into subbasin plans the natural variation in habitat conditions and the landscape processes that cause those variations.
- Resource managers: Develop a scientifically defensible overall production plan for each subbasin. The production plan should integrate natural and artificial production elements and explicitly link them to prioritized habitat-limiting factors and proposed habitat actions identified in the subbasin plans.
- The ISRP recommends that the wildlife and fish habitat protection Programs be better integrated and that projects be evaluated on criteria that favor those projects with documented benefits to both terrestrial and aquatic species.
- To remedy a major deficiency the ISRP found in most management plans, objectives, strategies, as well as locations where habitat improvements should occur, should all be prioritized.
- To facilitate better decisions about allocating limited funds, the ISRP recommended that the biological and economic costs and benefits of active and passive management practices should be evaluated, and these should be compared with the costs and benefits of land acquisition or protection.

Supplementation

Guided by Congress, the Program, and various biological opinions and agreements, the region has made substantial long-term financial and biological investments in artificial production. Anadromous fish supplementation

hatcheries rank as the Program's most expensive and ambitious on-the-ground measures.

BPA appreciates that hatcheries can provide important benefits to both ESA-listed and non-listed species. Artificial production can conserve the gene pools for the weakest stocks. Supplementation efforts may also help to expand the range of listed populations. Production facilities offset habitat losses and replace fisheries lost to FCRPS construction. In addition, hatcheries support harvest generally and the tribes' exercise of their fishing rights specifically. For rural communities and tribes that often bear a disproportionate share of the burden of protecting habitat through land-use restrictions and economic losses, artificial production also offers jobs and economic opportunity.

The agreements that BPA hopes to enter into soon with states and tribes include many hatchery and production related actions. The parties worked to structure the agreements so that the artificial production actions supplement and do not substitute for actions that other entities may be authorized or required to undertake. To support these hatchery projects, the tribes plan to continue to make available the identified biological benefits associated with the projects. In addition, they will obtain determinations from NOAA that the hatchery projects will not impede and where possible will contribute to recovery.

Recommendation: When contemplating next steps in artificial production, the Council should consider the suite of supplementation projects already in place, those in planning, and those committed to in pending agreements with tribal fisheries managers.

Hatchery Scientific Review Group (HSRG) Findings[45]

BPA generally supports and endorses the general guidelines for hatchery operation published by the HSRG in its 2004 Report. When the HSRG completes its final recommendations the Council, BPA, tribes and other appropriate entities should review hatchery reform recommendations relevant to artificial production actions undertaken through the Program, prioritize the recommended actions, and plan for cost-effective implementation. Highest priority should go to those recommendations that help recover ESA-listed populations and protect weak stocks.

[45] *See generally* FCRPS Action Agencies, 2007 FCRPS Biological Assessment Appendix B, § B.2.3-4 HSRG Guidelines for Hatchery Operation.

Resident Fish

The mainstem supports 60 resident fish species.[46] Of those 31 are natives. The other 29 are resident aliens, known as exotics.

Many exotic species receive state protection through regulations that limit their harvest, yet they prey on native anadromous fish and thwart the Program's mitigation and recovery efforts. Added together, exotic species may have a biomass near that of historic salmon runs, yet their competitive effects on native listed species remain unknown.

As anadromous fish stand to suffer most among fish species from climate change and human impacts, BPA recommends that the Program engage the things it can change—like exotic resident fish predation and competition. The Council should not straddle this issue. The Program should act affirmatively with measures that reduce the impacts that exotic resident fish have on native salmonids.

Looking back, the concern about anadromous fish drove the move to provide for fish and wildlife in the Northwest Power Act. The amended Program should reflect this concern and place protecting native anadromous fish above the supporting exotic resident fish.

Recommendation: Direct resident fish managers to ensure that the regulations they promulgate and enforce do not impede regional efforts to mitigate and recover listed anadromous fish.

Loss assessments

Past Programs adopted distinct sections covering anadromous fish, resident fish, and wildlife separately. To influence Program implementation to reflect this distinction, the Council created a 70-15-15 funding allocation policy. The origins of the Program's tripartite organization and allocation policy resulted as a compromise needed within and between resource managers.[47]

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[46] BPA, Corps, Reclamation, Columbia River System Operation Review Final Environmental Impact Statement Appendix K Resident Fish table 2.1 (Nov. 1995).

[47] Columbia Basin Fish and Wildlife Authority, Recommendations for Amendments to the NWCC 2000 Program, Final Draft at 8 (Mar. 6, 2008). In explaining why the Program should include separate anadromous fish, resident fish and wildlife sections, the document states that "[t]he management plans for these species are implemented through separate divisions institutionally among the fish and wildlife management entities."

Since the Act's initial raison d'etre was focused on anadromous fish, managers who worked on resident fish and wildlife feared that the Program would not address their issues and that anadromous fish would receive all of the region's attention. Separating out types of fish from each other, and from wildlife, and agreeing upon a funding allocation among the resource managers, was not necessitated by science or law.

Indeed, the subbasin plans show that fish and wildlife neither live in separate realities nor need to be mitigated as if they did. In the plans, as the Council directed, the resource managers looked at each subbasin as a whole. They chose focal species that included resident fish, wildlife, and anadromous fish to help characterize the status, functions, and management actions in the subbasins.[48]

Properly executed subbasin plans provide clear pictures showing the appropriate mitigations for target species—including resident fish—representing the ecosystems in each subbasin. Given this, additional resident fish assessments are not necessary, and certainly shouldn't be considered a ratepayer responsibility.

Assessing Resident Fish Mitigation to Date

The Program endorses BPA taking wildlife mitigation credit for wildlife habitat protected by fish projects. In an ecosystem-based Program, the inverse also follows: consider the fish value of wildlife habitat. In helping to implement the Program, resource managers sometimes completed large biologically significant projects by incorporating fish and wildlife elements into their planning.

In Montana, for example, the Montana Department of Fish, Wildlife and Parks combined BPA funds from a resident fish habitat project along with BPA funds from its wildlife trust to help secure over 142,000 acres from Plum Creek Lumber. The conservation easements expressly protected both fish and wildlife habitat.

The Warm Springs Tribe in Oregon secured the initial half of its Pine Creek project using "wildlife" funding. Along with the initial wildlife acquisition the Tribe procured an option for additional adjoining acreage. It exercised the option for the second half of the planned wildlife project when it received funds from BPA for a fish habitat project.

[48] Council, *Technical Guide for Subbasin Planners* at 15 (document 2001-20).

In its 1995 Program, the Council said that "Credit will be given for past mitigation actions associated with each hydropower project."[49] Similarly, the 1995 Program stated that to achieve the Program's resident fish goals would "necessitate basinwide coordination of all resident fish projects and with other basin activities. . . ."[50] The 2000 Program advocated that "wildlife mitigation projects should be integrated with the fish mitigation projects."[51] BPA follows this guidance by increasingly including resident fish habitat assessment provisions in its wildlife mitigation agreements. The new Program should expressly acknowledge the Council's support for BPA taking all available mitigation credit for every action it funds, regardless of whether the actions originates as one for anadromous fish, resident fish, or wildlife.

Recommendation: Before seeking additional resident fish assessments or major new habitat initiatives, the Program needs to account for the extent of past resident fish value from wildlife habitat and anadromous fish projects. The review should include any mitigation done to mitigate impacts from the FCRPS, whether BPA funded it or otherwise.

No FCRPS impacts in certain subbasins

Some subbasin plans and their summaries indicate that hydropower impacts (much less the FCRPS) are often not a factor limiting fish and wildlife. Where the FCRPS hasn't had direct impacts and is not a limiting factor in a subbasin, then the Program should only call for BPA to mitigate there under "appropriate circumstances."

Recommendation: Ascertain from the subbasin plans which ones document affects to resident fish from the FCRPS and consider the FCRPS a limiting factor. Address resident fish mitigation on an ecosystem basis. Question projects or measures calling for BPA funding in subbasins where the FCRPS did not affect resident fish and is not a limiting factor.

Substitution Policy

Resident fish substitution serves as a form of enhancement or off-site mitigation. The Act calls for enhancement, but in a limited role: only in "appropriate

[49] Council, Resident Fish and Wildlife Amendments to the Program § 10.1 (Sept. 1995).
[50] Id.
[51] Council, 2000 Program at 30.

circumstance." As such, substitution may serve as compensation in appropriate circumstances.

An argument sometimes arises contending that the Program should include (and BPA should fund) resident fish substitution until the substituted fishery resources equal those lost to FCRPS construction. This, however, ignores the wisdom of Congress and the best available science—"full mitigation" to achieve resident fish population characteristics prior to hydro development is not legally required or physically attainable.[52]

BPA offers instead that the "appropriate circumstances" for resident fish substitution arise today in those circumstances where the habitats created by the FCRPS dams, or those habitats remaining and unaffected by the dams, do not support self-sustaining populations of resident fish, such as in Lake Roosevelt.

Recommendation: If resource managers do not address the predation and competitive problems created by exotic resident fish, then the Program should consider those fish a substitute resource. If resource managers do address those problems, then the Program could reasonably call upon hydroelectric project owners, managers, and regulators to make further efforts to provide native, indigenous resident fish substitution. Until resource managers opt for the latter choice, the appropriate circumstances for further resident fish enhancement activities diminish greatly.

Wildlife

BPA believes that as the Program closes out its third decade, it should bring greater clarity and certainty to its provisions covering wildlife mitigation. While the 2009 amended Program is in effect, BPA expects to reach its mitigation goals for FCRPS construction impacts to wildlife and their ecosystems, save only the northern and southern Idaho areas and the Willamette. Progress in those remaining areas will depend in part on whether and how the Council engages several unresolved policy issues: 1:1 crediting, loss assessment annualization, out-of-place/out-of-kind mitigation, species stacking, and areas affected by inundation. BPA considers these to be implementation issues that do not fit within the scope of measures as the Act defines them. Nevertheless, because the Program has included them in the past, BPA will recommend how the Program should address these implementation issues.

[52] ISAB, Review of the Biological Objectives in the 2000 Fish and Wildlife Program at page 9.

Several converging factors suggest that the Program needs a broader approach to wildlife mitigation. Those factors include:

- the increasing scarcity of mitigation properties,
- growing concerns about the federal government purchasing property in areas where large amounts of property are already owned by governmental entities,
- rising land costs,
- the effects of development on wildlife corridors, and
- growing interest in environmentally friendly agricultural and forest management practices—also know as "working landscapes."

BPA supports forging a new course by acknowledging and embracing innovative alternatives to form partnerships. The Program has yet to deeply explore using market-based mitigation methods, such as mitigation banking, which can both maintain working landscapes and protect habitat. These could address the factors identified above, drastically reduce operations and maintenance and habitat improvement costs, and also provide carbon sequestration benefits.

Such an approach may allow for a broader mitigation footprint as compared to geographically dispersed, isolated mitigation properties. It also could lend itself to providing greater dual mitigation benefits to both fish and wildlife. Similar approaches are already underway in Oregon's Tualatin Valley, and also led by the Pacific Forest Trust, ecotrust, and other non-governmental organizations. The Program should also consider the comparative habitat benefits of passive land management techniques versus benefits from active management.

Crediting

BPA has consistently taken 1:1 credit for its wildlife mitigation actions for nearly two decades. On several occasions BPA documented why it settled on a 1:1 mitigation crediting ratio for habitat protection and improvement.[53] The reasons articulated before still apply.

[53] Letter from Stephen Wright, BPA Administrator/CEO, to Larry Cassidy, Council Chairman (regarding wildlife crediting history and policy) (Mar. 1, 2002).

BPA brings several unique beneficial attributes to its wildlife mitigation effort. To begin, fish and wildlife managers and conservation groups select the projects that BPA implements. They determine quality, kind, and location of the habitat BPA secures and improves. The states, tribes, or conservation groups sponsoring and selecting the projects typically get to own them. Often, they receive operation and maintenance funding, and monitoring and evaluation funding to assess the wisdom of acquiring the original habitat.

Since the first wildlife habitat acquisition in 1990, approximately 90 percent of all mitigation proposals have been for fee title acquisition. The wildlife managers say that they recommend fee title acquisition as their primary mitigation approach because they believe that it provides the greatest assurance of long-term benefits to wildlife. Yet many of them argue that the mitigation method they use most—and that costs the most—should accrue the least amount of credit. Nevertheless, all but one have all signed agreements over the last 19 years that expressly adopt l:l crediting or are premised on 1:1 crediting.

Moreover, at the Council's strong urging, BPA worked with its independent auditors to do something unique in the utility business: capitalize land acquisitions for wildlife habitat. To do this, though, BPA had to demonstrate that the habitat acquisitions helped to irrevocably retire a known debt or obligation. The debt was measured in habitat units, and the region premised the capitalization on 1:1 credit. Attempts to change the credit BPA takes or deserves could potentially breach mitigation contracts. It also could thwart BPA's ability to capitalize future wildlife habitat acquisitions.

Guidance: The Program needs to acknowledge the binding legal plans and commitments made by wildlife managers in their mitigation agreements to support BPA taking 1:1 credit.

Annualizing Habitat Loss Assessments

In past Program amendment cycles, regional wildlife managers recommended that the Council adopt annualized FCRPS construction and inundation losses and change the crediting ratio to 3:1—three replacement units for each one lost. The final 2000 Program melded these issues. The Council incorporated

annualization obliquely as part of a rounding off exercise when it adopted a 2:1 crediting ratio.

Confusion surrounds the annualization concept.[54] It is not like compounded interest on invested savings.[55] The Council rejected annualization in the past and should continue to do so in the future.

Guidance: Annualization lacks scientific support. The Council should continue to reject calls to try to annualize the wildlife loss assessments in the Program.

Out-of-place and Out-of-kind Mitigation, Species Stacking

While BPA's wildlife mitigation efforts to date address well over 60 percent of the losses identified in the Program, mitigation—and crediting for existing mitigation—lags in several areas in the region. To determine whether the mitigation, or the crediting, is lagging BPA hired the leader of the Regional HEP Team to review and analyze the wildlife mitigation efforts in the Willamette and Albeni Falls basins. The following discussions on the Willamette and Albeni Falls summarize the findings and recommendations from that review. The quotations that follow in the discussions come from the review.[56] In addition, BPA believes that the observations and findings related to these areas apply equally to southern Idaho where mitigation efforts have trailed somewhat.

The Willamette

In the loss assessment covering FCRPS hydroelectric dams in the Willamette Basin, it is well documented that the assessment team did not use established species models as called for in the guidelines for a proper Habitat Evaluation Procedure (HEP). Instead, they used species checklists coupled with expert opinion. The result: "totally subjective assessments" that would be "extremely difficult to replicate even in a best case scenario."

[54] See the Appendix, Section F, for a more detailed description of annualization.
[55] Even if annualization meant "cumulative past losses," the Council already dismissed that concept as unworkable in the Program. In the past the Council did not adopt the cumulative loss approach to anadromous fish because "[i]t is unknown whether even 5 million to 11 million adult salmon and steelhead can be restored to the basin, let alone enough fish to make an estimate of cumulative losses important." 1987 Program, Appendix C pt. I Council Response to Comments at 6.
[56] Ashley, Paul R., Habitat Unit Stacking White Paper (Feb. 19, 2008).

The Willamette assessment also varied from the norm in that it lacked ground transects. Therefore, solid data does not support the conclusions in the assessment.

The Willamette assessment is distinctive from others with more species "stacked" or used to represent a particular cover type, compared to other assessments any where else in the Columbia River Basin. Whereas most other assessments used two to four species per cover type, the Willamette assessment had over 13 in some instances (and none with established, peer reviewed models).

Regional interest has arisen in trying to find an acceptable way to track habitat losses and gains through BPA's mitigation efforts. But state and federal agencies, non-governmental organizations (NGOs), and interested public have made it clear that they do not support the HEP approach in the Willamette Valley. An alternative would be to use the Northwest Habitat Institute's new and innovative Combined Habitat Assessment Protocols (CHAP) tool. While BPA and others find CHAP a reasonable tool for accounting for habitat losses and gains through mitigation, the ISRP's reviews found insufficient evidence "that the CHAP protocol represents a substantial improvement over HEP for wildlife habitat assessments," and that it did not represent a sufficient improvement of habitat evaluation practice leading to quantifiable benefits to fish and wildlife."[57] Fortunately, the Program only needs HEP or CHAP to serve as an accounting tool for documenting habitat changes, not as a tool to quantify relative benefits to fish and wildlife populations.[58]

The Willamette loss assessment also distinguishes itself as the only one in the Program that includes an area significantly greater than that impacted by the hydroelectric facilities.[59] While the projects in the Willamette inundated 17,791 acres, the loss assessment bases its losses on 30,776 acres. This inflates the actual losses, whether measured in Habitat Units or acres, by 42 percent. Claiming losses from an area broader than the dam and reservoir area lacks precedent and

[57] ISRP, Review of Combined Habitat Assessment Protocols (doc. 2007-11) (Aug. 13, 2007).
[58] BPA believes the Program can, nevertheless, continue to accept its underlying principle that implementing actions to protect and improve habitat are an important element to mitigation and recovery. *See*, 2000 Program at 20 ("This Program relies heavily on protection of, and improvements to, inland habitat as the most effective means of restoring and sustaining fish and wildlife populations." *See, also.*, FCRPS Action Agencies 2007 FCRPS Biological Assessment at Appendix B.2.2.2.
[59] The Habitat Unit Stacking White Paper did not address this issue.

is inconsistent with the rest of the Program. Additionally, the Federal Energy Regulatory Commission does not look that broadly when it requires mitigation in the nonfederal hydroelectric licenses it issues (under similar statutory language to that guiding the Program).

Guidance:[60] Given the lack of appropriate species models and the great expense, the Willamette loss assessments should not be redone. Instead, the Stacking White Paper offers two alternatives that resolve the stacking issue.

- The most timely, cost-effective approach to crediting Willamette River Basin projects, assuming credible habitat variable data is important, is to use the Northwest Habitat Institute's new and innovative Combined Habitat Assessment Protocols (CHAP) tool.
- If habitat variable data verification is not important, then a more simple and straightforward approach of using an "acre for acre" should be used. In that case, BPA would be willing to let Willamette resource managers and non-governmental organizations select the acreage for mitigation, and then mitigate at a rate of one acre for each acre inundated.

In addition to using either alternative, overall losses in the Willamette, regardless of the measuring unit used, should be multiplied by .6 to offset the excess above pool affected area included in the assessments.

Albeni Falls

Mitigation for Albeni Falls has become problematic for several reasons. No loss assessment cover type/species matrix[61] guides mitigation efforts. Therefore, wildlife managers do not credit or stack HUs in a consistent manner between different managers or different projects. In addition, wildlife managers resist acknowledging BPA credit for any habitat type or species not identified in the Albeni Falls loss assessment to credit mitigation projects.

Even where wildlife managers target and acquire priority habitats, most acquisitions include non-target cover types. BPA thus funds acquisitions with cover types the Albeni Falls loss assessment does not include.

Loss assessment cover type/species matrices provide the basic framework that guides HEP planning efforts. The region needs to resolve this cover type/species

[60] BPA modified the recommendations in the White Paper to craft this guidance for both the Willamette and Albeni Falls.
[61] *See* Appendix, Section G, for a description and sample of a matrix.

matrix matter in order to execute adequate, equitable, and consistent HEP analyses at Albeni Falls. Resolving the stacking and related crediting questions also hinges on addressing the cover type/ species matrix concern.

Absent a cover type/species matrix to guide HEPs on the out-of-place and out-of-kind habitats used to mitigate for Albeni Falls, BPA has been unable to take the full credit wildlife managers agreed to recognize. The net result is lower than expected credit for Albeni Falls mitigation projects.

Guidance: In implementing Albeni Falls mitigation, the Stacking White Paper recommended two alternatives.

- Credit all past and future mitigation using the same number of target species for each habitat on the mitigation site as was used for each habitat type in the loss assessment.
- Apply an "acre for acre" approach. BPA would be willing to let resource managers and non-governmental organizations select the acreage for mitigation, and then mitigate at a rate of one acre for each acre inundated.

Model Management Plans

As the Program's portfolio of habitat management projects continues to grow, so too does the need to provide a standard model for the management plans guiding project management. BPA's fish and wildlife memorandums of agreement (MOA) and conservation easements typically require the property manager to develop a plan but don't specify what exactly a plan should include. BPA usually provides guidance that relates back to the underlying agreement that governs the project. Broadly, BPA has called for plans to include the following:

- Steps to meet the project goals stated in the project proposal. Often some goals extend beyond BPA's commitments to the project but need to be included to provide the full plan even if BPA doesn't review, approve, or fund the plans for those elements.
- Steps to fulfill the project or land manager's commitments in any agreements with BPA. Many MOAs, for example, call for the land manager to achieve and maintain native habitat and species diversity on a self-sustaining basis.
- Pertinent Program requirements, if any.

A model plan could become the vehicle that the region uses to act on the ISRP's recommendation to standardize M&E on habitat. It could specify how project managers would report their results to facilitate data collection, storage, and analysis.

Recommendation: BPA and resource managers should develop a template for habitat management plans for mitigation acquisitions. Use with new agreements and projects; phase into existing projects as current plans and agreements expire or get revised.

The Willamette Basin and its Ecosystems

There is now considerably more mitigation planning for the Willamette subbasin than in the past. The subbasin plan completed in 2005 through the Program received high marks in independent review. Oregon issued its state-wide Conservation Strategy in 2006 with heavy emphasis on the Willamette. And this July NOAA Fisheries plans to complete a biological opinion on Willamette basin FCRPS hydroelectric projects. These planning documents show that this subbasin faces many unique threats and opportunities. Assessing these suggests that the Willamette offers new opportunities for coordinating innovative approaches to mitigation based on habitats, not just specific species.

Threats

1. Population growth and the associated development constitute the greatest threat to fish and wildlife in the Willamette subbasin.
2. The federal dams in the Willamette constitute a threat for winter steelhead and spring chinook. The flood control attributes of these dams alter downstream flows, sediment transport, water temperatures and have allowed humans to safely settle the river's large flood plain—historically the most productive aquatic habitat.
3. Hatchery production makes up a significant portion of the runs on most tributaries. Introduced summer steelhead production presents a genetic and ecological risk to endangered native salmonids. Winter steelhead face risk from the relatively high rates of hatchery summer steelhead spawning in the wild.[62]

[62] BPA *et. al*, Supplemental Biological Assessment of the Effects of the Willamette River Basin Flood Control Project on Species Listed Under the Endangered Species Act (2007).

4. Largely as a result of population growth, real estate prices are expected to increase exponentially in the Willamette. Habitat protection based on fee title acquisitions has already become almost prohibitively expensive.

Opportunities

1. Both the biological opinion for Oregon chub and bull trout and the biological opinion for winter steelhead and spring Chinook will be finalized by July of 2008. These opinions will include actions aimed at:
   - providing fish passage where feasible,
   - providing temperature control,
   - altering hydro operations to meet flow targets,
   - improving hatchery management,
   - funding RM&E to support biological opinion implementation, and
   - funding additional offsite habitat restoration.
2. The Oregon Watershed Enhancement Board has announced a Special Investment Partnership focused on the Willamette. This Program would bring $6 million to the Willamette over the next biennium.
3. The Meyer Memorial Trust has announced The Willamette River Basin Restoration Initiative. This initiative will be aimed at floodplain restoration on the mainstem of the Willamette. Funding levels have not been finalized yet.
4. The Hatchery Scientific Review Group will complete its review of Willamette hatcheries in December 2008. The findings will help guide needed reforms.
5. The Willamette Floodplain Restoration Study, a multi-agency planning effort lead by the Corps, has produced new methods for analyzing and selecting restoration sites. The approach integrates salmonid, wildlife, and hydrology models to address ecosystems and optimize benefits to the targeted resources.

Recommended strategies: Future actions in the Willamette should engage the threats and opportunities listed above with the ecosystem-based strategies identified in the Appendix, Section H.

Implementation Recommendations

As a procedural matter, BPA reiterates a long running concern: that statements regarding federal agency mitigation responsibilities under either section

4(h)(10)(A) or 4(h)(11) find a home in a technical appendix, not the Program proper. In this way the region retains ready access to the Council's views and intent regarding Program implementation, and those views are adopted—but not amended into the Program as measures meeting the Act's requirements for amending the Program found in section 4(h)(6).

As for the substantive matters, BPA will not repeat verbatim or in total its past communications covering its preferences regarding how to refine its share of Program implementation.[63] Several significant issues, however, bear reiterating here.

- Maintain the ISRP in its current role as a credible science broker. Congress amended the Act to create the ISRP to eliminate the conflict of interest inherent in a Program where the same resource managers propose, review, rate, and implement projects.

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63 *See* documentation accompanying BPA's funding decisions for implementing the Program during FYs 2007-09:

- FY 07-09 Fish and Wildlife Capital Account Project Selection Decision Letter (55Kb pdf) (02/13/07)
- FY 07-09 Fish and Wildlife Project Selection Decision Letter Enclosure (Revised) (02/26/07)
- FY 07-09 Fish and Wildlife Project Selection Decision Tables (Revised) (626Kb pdf) (02/21/07)
- FY08-09 Expense Budget Adjustments (98Kb pdf) (05/01/07)
- FY08-09 Capital Budget Table (71Kb pdf) (05/18/07)
- FY07-09 Planning Budgets for Fish and Wildlife Projects (206Kb pdf) (07/02/07)
- FY 07-09 Fish and Wildlife Proposals Final In Lieu Ratings (162Kb pdf) (02/13/07)

In addition, see BPA's documentation supporting its budgeting levels for this rate period.

- http://www.efw.bpa.gov/IntegratedFWP/YINCRITFCLetterandAttachments.pdf (BPA Letter to CRITFC and Yakama Nation (June 20, 2005))
- http://www.efw.bpa.gov/IntegratedFWP/05CBFWAResponse422.pdf (BPA letter to CBFWA (Apr. 22, 2005)).

- Rather than including specific projects—which is another way of specifying which entities receive Program funding—the amendments should improve the Program's biological focus and effectiveness.
- Follow the ISRP's advice to develop a "framework from which to evaluate the priority and potential benefits of proposed projects."[64]
- Ensure that the project selection process clearly links projects to the applicable subbasin and recovery plan limiting factors, and that those in turn link to broader Program objectives.
- Emphasize projects that benefit fish and wildlife directly. Take a more structured, regionally coordinated and cost-shared approach to RM&E. With the RM&E component taking over 42 percent of BPA Program expenditures, expense funding benefiting fish and wildlife directly has dropped to 34 percent.[65]
- BPA does not object to the Program continuing to discuss coordination. The Act, however, suggests that coordination technically falls outside the Program's statutory domain and instead gets addressed separately through section 4(g)(3).[66]

Conclusion

These recommendations convey BPA's full support for the Northwest Power Act's mitigation vision and for the Council in fashioning Program amendments that help guide the Columbia Basin's comprehensive fish and wildlife mitigation and recovery endeavors. By integrating the biological opinions that direct FCRPS operations, recovery plans, and the numerous agreements that BPA implements with the region's resource managers—including the forthcoming historic state and tribal agreements—we believe that the 2008 Program can be the best yet.

[64] ISRP, ISRP Retrospective Report 1997-2005 at 61 (doc. 2005-14) (2005).
[65] BPA PISCES, Report Center Report titled "Types of Work Funded" (Mar. 21, 2008 update).
[66] 16 U.S.C. § 839b(g)(3).