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April 4, 2008

Bill Booth, Chairman
Northwest Power and Conservation Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204

Dear Mr. Booth:

I am writing on behalf of the State of Washington regarding recommendations for amendments to the Northwest Power and Conservation Council's (Council) Columbia River Basin Fish and Wildlife Program (Program). Along with this letter, I am including a letter from the Washington Department of Fish and Wildlife (WDFW) endorsing the recommendations of the Columbia Basin Fish and Wildlife Authority; and recommendations from the Governor's Salmon Recovery office (GSRO) and the Washington Department of Ecology (Ecology).

These recommendations should be viewed within the context of the following comments:

1. The Council should focus its effort in developing an overarching Program framework that more clearly defines success in terms of biological benefit and management.

2. The Council should establish a more rigorous accountability tracking system that reports on whether projects are implemented and are producing the biological benefits as proposed.

3. The Council should provide an annual report to the region that summarizes through the use of high-level indicators what the Council has done in relation to what needs to be done regarding the management of the Program. For the Council's consideration, examples of the type of indicators that might be used are also attached to this letter.

4. The Council should review and assess the specific recommendations to the Program, as proposed by GSRO, Ecology and WDFW, within the context of this overarching management, accountability and reporting framework.

Given the ecosystem nature of the work, and the many individuals, organizations and agencies involved in fish and wildlife management across the Columbia Basin, Washington believes the Council must perform a central role in promoting consistency

and coordination, along with a venue for vetting various and diverse views and interests. From Washington's perspective, the Council should in particular focus on ensuring that there is consistency with the Federal Columbia River Power System Biological Opinion (FCRPS BiOp) and any associated memorandum of agreements, and consistency with the recovery plans and implementation work of our regional salmon recovery organizations. Finally, on those questions where there is substantial scientific controversy or uncertainty, Washington urges that the Council request independent science review.

Washington believes its recommendations should be viewed within an overarching accountability framework for the Program as outlined above, and within a broader context that promotes further collaboration and resolution of differences facilitated by the Council. Washington does not support any recommendations that may impede the accountability and broader review functions of the Council or shown to be inconsistent with the FCRPS BiOp or regional salmon recovery plans developed in Washington and approved by the National Marine Fisheries Service. These recommendations represent the starting point for the Council in developing the Program. We also understand that the Council's role is to resolve any inconsistencies among recommendations and develop a Program in the context of the broader regional interests recognized in the Power Act.

Sincerely,

Bob Nichols
Advisor for Salmon and Columbia River,
Office of Governor

Copy: Jeff Koenings, Ph.D, Director, Washington Department of Fish and Wildlife
Chris Drivdahl, Director, Governor's Salmon Recovery Office
Jay Manning, Director, Department of Ecology
Executive Directors, Regional Salmon Recovery Organizations
Dr. Tom Karier, Northwest Power and Conservation Council
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April 3, 2008

Bill Booth, Chairman
Northwest Power and Conservation Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204

Dear Mr. Booth:

Thank you for the opportunity to submit recommendations to amend the Northwest Power and Conservation Council's (Council's) Columbia River Basin Fish and Wildlife Program (Program). Over the past year, the Washington Department of Fish and Wildlife (WDFW) has actively participated in the development of, and shared data and expertise to support, the science-based amendment recommendations submitted to the Council by the members of the Columbia Basin Fish and Wildlife Authority (CBFWA). We endorse sending the CBFWA amendment recommendations to the Council for their consideration for a number of reasons.

First, the CBFWA amendment recommendations are consistent with the broad-sensed objectives we articulated in State Fish and Wildlife agencies' presentation to the Council in October 2007. Developed through consensus of regional fish and wildlife managers, the balanced and broad-based CBFWA recommendation package provides scientific recommendations that will assist the Council in carrying out its charge to mitigate for the construction and operational impacts caused by the Columbia River hydropower system. The package also facilitates the development of performance measures and evaluation tools that will allow the Council and the Region to gauge the success of the Program.

Second, the CBFWA recommendations are consistent and complement the existing and future activities of the agencies and tribes. The 2008 Program provides an opportunity for the Council to fully integrate a number of on-going management plans within the Columbia Basin. The recommendations submitted in the CBFWA package are consistent with agency plans that we have developed and are consistent with our management position in other natural resource management arenas. It was our intent that the CBFWA recommendation package is consistent with the Draft 2008 Federal Columbia River Power System Biological Opinion (FCRPS BiOp), Washington's comments on the Draft FCRPS BiOp submitted earlier this year to the Action Agencies, Washington state

salmon recovery planning, Washington state-listed endangered species recovery efforts, the Hatchery Scientific Review Group (HSRG), the Washington Department of Ecology's Columbia River Basin Water Management Program, and the Washington Comprehensive Wildlife Conservation Strategy. WDFW supports the draft 2008 FCRPS BiOp and its supporting comprehensive analyses, and the state of Washington comments on that BiOp submitted earlier this year to NOAA, including the importance of developing a strong status monitoring program to measure progress in recovery. WDFW also supports the work of salmon recovery planning in Washington. To the extent that there are any inconsistencies between our recommendations submitted in the CBFWA package and these other efforts, WDFW would like to work with the Council to resolve those differences.

Third, the CBFWA recommendations takes a comprehensive approach that builds upon the elements of the current Program and subsequent subbasin plans and mainstem amendments and ties them together into an ecosystem-based context for fish and wildlife in the Basin. While many of these elements can be found in the current Council plans, the CBFWA recommendations bring them together in a way that allows for a programmatic approach to mitigation which represents an evolutionary improvement over previous Council programs.

Fourth, the CBFWA recommendations addresses the Council's need to have the capacity to address future challenges, without diminishing ongoing efforts. These challenges include human population growth, climate change, and ensuring that the fish and wildlife resources have sufficient water quantity and quality. The uncertainty of the magnitude of these influences needs to be considered and incorporated in the 2008 Program. It is critical to conduct assessments of how vulnerable key ecological systems may be to climate change, particularly habitats that support focal species or are known concentrations of high biodiversity.

On a broad scale, certain West coast salmon forecasts for 2008 provide an indication of the detrimental consequences when management and mitigation measures fail. Last month, a letter was signed by the three western states' governors to the Secretary of Commerce requesting him to consider declaring a fishery resource disaster should the Pacific Fisheries Management Council close or severely limit fishing opportunities in order to protect California Central Valley Chinook salmon and some Columbia River stocks. This serves as a stark example of the importance of salmon to providing stability to Pacific fisheries and Washington coastal economies. We must continue to recover depleted salmon stocks, manage to keep healthy stocks healthy, and include artificial production as one element of mitigation.

Finally, the CBFWA amendment recommendations encourage the Council to develop a comprehensive Program that will support a targeted solicitation for proposals. In the

future, the Council's request for proposals should provide the specificity that ensures that the measures in the 2008 Program will be accomplished. The future project solicitation should also allow broad-based regional participation, scientifically based prioritization, realistic implementation time frames, and incorporate tools for gauging success.

The Region needs a comprehensive, robust 2008 Fish and Wildlife Program that will serve as a strong foundation to guide upcoming important efforts, including the development of the next Rate case, the Sixth Power Plan, and the next project solicitation cycle. WDFW believes the CBFWA recommendations represent a sound starting point for the Council to consider in developing that Program. We look forward to working with the Council as a final Program is developed and ultimately adopted.

If you have any questions about our recommendations, please contact Bill Tweit at (360) 902-2723 or Nate Pamplin at (360) 902-2693.

Sincerely,

Jeff P. Koenings, Ph.D.
Director

cc: Tom Karier, NPCC
Dick Wallace, NPCC
Bob Nichols
Chris Drivdahl
Bill Tweit
Nate Pamplin

Attachment

Part I. Washington Governor's Salmon Recovery Office Recommendations

The primary responsibility of the Washington Governor's Salmon Recovery Office (GSRO) is to support and assist implementation of our statewide strategy to recover salmon and steelhead species that are listed under the federal Endangered Species Act. The statewide strategy relies upon coordinated implementation of locally developed regional salmon and steelhead recovery plans that are approved by the National Marine Fisheries Service (NMFS). The coordination of recovery plan development and implementation is the responsibility of regional salmon recovery organizations as provided by state law (RCW 77.85.090), and as funded through contracts with the state.

In developing the following recommendations for the Program, the GSRO has coordinated with Washington's regional salmon recovery organizations in the Columbia Basin (i.e. Lower Columbia Fish Recovery Board, Snake River Salmon Recovery Board, Yakima Basin Fish and Wildlife Recovery Board, and Upper Columbia Salmon Recovery Board). Each of these regional organizations may also be submitting recommendations for consideration by the Council. All of GSRO's recommendations are guided by our support for coordinated implementation of regional salmon recovery plans and related subbasin plans in Washington. The GSRO has also coordinated with the Washington Department of Ecology (Ecology) and incorporated recommendations from Ecology in this document (i.e. Part II).

1. Recognition and Use of Salmon and Steelhead Recovery Plans

Recovery plans for the areas covered by Washington's four regional salmon recovery organizations in the Columbia Basin have been formally adopted by NMFS or have interim approval from NMFS, pending completion of multi-state recovery plans. These recovery plans were developed through collaborative, inclusive and open local processes and are the authoritative source for recovery goals, strategies and measures that address limiting factors, and actions for ESA-listed salmon and steelhead. Each recovery plan emphasizes the importance of on-the-ground projects to protect and restore habitat by addressing habitat conditions that limit the recovery of ESA-listed salmon and steelhead populations. NMFS is also completing recovery plans for the limited areas of the Columbia Basin in Washington outside the areas covered by the four regional salmon recovery organizations (e.g. Big White Salmon, Klickitat, and Lower Mid-Columbia Subbasins).

Recommendation 1a: The Program should recognize the regional salmon recovery plans in Washington as updates that supercede the Program subbasin plans as these plans apply to ESA-listed salmon and steelhead. The recovery goals, strategies and measures that address limiting factors, and actions in the regional plans should be used to identify, prioritize and select projects for funding by the Program. The regional salmon recovery organizations should be engaged to provide local review of consistency of project proposals with recovery plans and to comment on the priority of projects for funding in relation to recovery plans. This coordination approach should be used during

implementation of both the Program and the Federal Columbia River Power System Biological Opinion (FCRPS BiOp).

After adoption by NMFS, the Lower Columbia River Estuary Recovery Plan Module (Estuary Module) will become a component of all salmon and steelhead recovery plans in the Columbia River Basin. The actions in the Estuary Module will benefit Columbia River Basin salmon and steelhead populations as they use the lower river and estuary; an important area for rearing and as a migration corridor to the ocean.

Recommendation 1b: The Program should recognize the Estuary Module as an update that supercedes subbasin plan provisions related to ESA-listed salmon and steelhead. The strategies and actions identified in the Estuary Module should be used as a basis to identify, prioritize and select projects for funding by the Program. Monitoring and reduction of toxic pollutants should also be considered a priority for Program funding, to the extent that such activities relate to toxic contaminants that are shown to have substantial lethal or sub-lethal effects on salmon or steelhead using Columbia River Estuary, lower Columbia River, or lower river tributary habitat. The Lower Columbia River Estuary Partnership should be engaged to provide review of consistency of project proposals with the Estuary Module and to comment on the priority of projects for funding in relation to the Estuary Module. This approach to coordination should be used during implementation of both the Program and the FCRPS BiOp.

2. Coordinated Approaches to Research, Monitoring and Evaluation (RM&E)

In Washington, the Forum on Monitoring Salmon Recovery and Watershed Health (Monitoring Forum) is responsible for coordinating the broad array of technical and policy issues and actions related to monitoring salmon recovery and watershed health. The GSRO, and many other representatives of state and federal agencies, tribal and local governments, regional salmon recovery organizations and others are active participants in the Monitoring Forum. The Monitoring Forum is also working with other larger scale efforts to coordinate monitoring and evaluation efforts related to salmon recovery and watershed health, such as the Pacific Northwest Aquatic Monitoring Partnership (PNAMP). The Council and Bonneville Power Administration (BPA) are participants in many of these efforts.

Given the extensive commitment in the FCRPS BiOp to RM&E, there is also need for close coordination between BiOp RM&E work and that which is covered under the Council's Program in order to prevent overlapping or duplicative efforts that may be inefficient and give rise to inconsistencies in data and reporting.

Recommendation 2a: The Monitoring Forum is submitting recommendations to the Council for Program amendments. The GSRO fully endorses the Monitoring Forum's recommendations for consideration by the Council.

Recommendation 2b: The Council's RM&E Program should be coordinated and consistent with similar and related efforts included in the FCRPS BiOp.

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3. Coordinated Reporting of Status and Progress

Reporting the status of Program actions and the resulting progress in meeting clearly defined objectives is a fundamental aspect of accountability. A high-level annual or biennial report that includes key information on Program objectives, actions, results, and progress in meeting objectives for the Columbia Basin is needed. The development and preparation of such a report should be coordinated with other efforts that provide similar reports at different scales, such as Washington's biennial State of Salmon in Watersheds Report (SOS Report).

In addition, the Columbia Basin Fish and Wildlife Authority's (CBFWA) *Status of Fish and Wildlife Resources in the Columbia River Basin* (*Status*) contains very good information. However, the absence of standardized categories of information contained in *Status* makes it difficult if not impossible to "roll up" this information so that it can be displayed by overall or "high-level" indicators that are clear. This, along with other key sources of information such as NMFS's Pacific Coastal Salmon Recovery Fund report to Congress provide information to the general public and can benefit from more standardized reporting of information. Key, overarching and consistent indicator information should emerge from coordination of these efforts so that such information can be accessible and provided to the public.

Recommendation 3a: The Program should include a commitment by the Council to prepare a report at a regular interval, with high-level indicators, on Program actions, results and progress in meeting specific Program objectives across the scope and scale of the Program. This effort should be coordinated with efforts to prepare similar reports at different scales, such as Washington's SOS Report. The Council should also coordinate its efforts to select high-level indicators, consistent with similar work by the Monitoring Forum, NMFS, and CBFWA.

Recommendation 3b: While we acknowledge that the Program's mandate is broader than the focus of the FCRPS BiOp, ESA-listed salmon and steelhead species are a critical subset of fish populations affected by the federal hydro system. Given the importance and relevance of the FCRPS BiOp effort, the Council Program should include the same overarching indicators as those used within the FCRPS BiOp.

4. Hatchery Scientific Review

The Hatchery Scientific Review Group (HSRG) is developing recommended solutions for ensuring that hatchery practices and related harvest management decisions are consistent with achieving recovery goals and implementing recovery plans for ESA-listed and non-listed salmon and steelhead populations in the Columbia Basin. The HSRG recommendations will be completed by the end of 2008 and will be used by the fishery co-managers to develop recommended action plans for improving current hatchery facilities and practices. These action plans will also form the context for development of Hatchery Genetic Management Plans and Harvest Management Plans for approval by NMFS. However, these action plans may not be completed in time to be incorporated into or specifically reflected in the Program amendments.

Recommendation 4: The Program should include a commitment to incorporate the results of the HSRG and co-managers process into the Program, to the extent those

results are confirmed as consistent with recovery goals and plans and are included in Hatchery Genetic Management Plans adopted by NMFS. In Washington, the confirmation of consistency with recovery goals and plans should be obtained through coordination with affected regional salmon recovery organizations.

5. Responding to Climate Change and Population Growth Impacts

The ISAB has provided reports to the Council on the potential effects of climate change and human population growth that relate to the Program. These reports are clear that climate change and population growth can significantly increase the risk of habitat changes in the Columbia Basin that will make species, particularly ESA-listed species, more vulnerable to further decline or even extinction. These habitat changes, especially those caused by climate change, may offset to a significant extent, the positive benefits of actions taken under the Program. Current modeling tools can provide details of potential changes and risks for key habitat attributes, such as stream flow and temperature, at a watershed scale. However, such modeling has been done or is currently scheduled for only a very few Columbia River subbasins and most modeling efforts have focused on water quantity. Climate change will bring warmer summer temperatures and an earlier snow melt, so modeling and monitoring will need to focus on both water quantity and quality, particularly water temperature.

Recommendation 5: The Program should include provisions for watershed scale hydrology and habitat modeling of the potential effects of climate change and human population growth. Such modeling should be conducted for all subbasins where use of coarse screening criteria shows a high to moderate risk of substantial impacts to key habitat attributes from climate change and/or population growth.

6. Effective Nutrient Enhancement for Watershed Productivity

Scientific studies have hypothesized the historical importance and confirmed the current importance of marine-derived nutrients for productive watershed ecosystems and for the freshwater productivity of salmon and steelhead. A number of field experiments have used various types of nutrient enhancements (e.g. carcasses, carcass analogs) to significantly increase the freshwater rearing productivity of salmon and steelhead. Effective methods for nutrient enhancement need to be pursued where nutrient deficiency is a factor limiting habitat productivity. The funding and use of these methods also need to be correlated with subbasin biological objectives and integration of harvest, hatchery and habitat actions to increase spawning and rearing productivity in freshwater habitat while limiting the genetic (e.g. reduced fitness) influence of hatchery fish.

Recommendation 6: The Program should include further research on the effectiveness of nutrient enhancement methods, as needed, while also funding projects in subbasins where assessments have shown lack of nutrients to be a factor limiting habitat productivity and which propose methods that have demonstrated their effectiveness. Such projects should be given higher priority where they are also part of an integrated strategy for habitat, harvest, and hatchery actions.

7. Research on Other Critical Uncertainties

Given the All-H Analysis, and life-cycle approaches to salmon recovery, key uncertainties exist regarding the relative impacts of hydro and harvest operations on the ability of ESU/DPS-scale salmon recovery efforts to meet their respective recovery objectives.

Recommendation 7a: To help clarify the role of dams and reservoirs in the Columbia, the Council should conduct research to compare juvenile fish mortality in the Columbia-Snake mainstem attributed to the hydrosystem with fish mortality in un-dammed rivers such as the Fraser.

Recommendation 7b: The Council should conduct research that tracks survival at each stage in the life-cycle in order to evaluate opportunities for improvement; i.e., rearing, dam passage, reservoir passage, estuary, ocean, harvest, adult returns. Given the intensity of focus of the effects of dam passage, such research should explicitly and comprehensively compare the relative value of spill vs. transport, by project and by ESU/DPS, and identify the safest passage route and spill levels for juvenile and adult migrants for each hydroelectric project. Research should provide particular focus on the effect of spill, flow augmentation and barging on the overall survival of fall Chinook, including the effects on "holdover fish". BPA contracts to support Snake River Fall Chinook should specify the number of fish to be provided for the Fall Chinook Transport Study.

Recommendation 7c: The Council should initiate a review of the compatibility of current harvest rates and escapement goals and incidental take levels with the survival and recovery of each ESU/DPS, and review whether current or additional selective harvest techniques could be employed in the Columbia River to produce further biological benefit in relation to recovery goals.

Recommendation 7d: The Council should develop and test performance metrics, consistent with HSRG recommendations (see Recommendation 4) for supplementation projects that are consistent with the maintenance and protection of self-sustaining natural populations.

Recommendation 7e: Acknowledging their contribution and potential, the Council should evaluate Intensively Monitored Watersheds and examine the cost-effectiveness of this approach in providing essential M&E information.

8. Project Application Efficiencies

The project solicitation format is encumbered by an initial request for voluminous information that can intimidate those who are new to the project application process and may deter many from applying for Fish and Wildlife Program funds.

Recommendation 8: The Council should provide earlier and clearer direction regarding the specific types of projects that it is encouraging in order to address priority needs, and employ the use of a short-form process to screen projects that conceptually do not meet needs of the Program.

9. Columbia Basin Salmon Strongholds

The Council has previously recognized the benefit and importance of protecting fish and wildlife populations that are relatively healthy and productive. A salmon or steelhead stronghold refers to a subbasin, watershed or other defined spatial area where salmon and/or steelhead populations are strong and diverse, and includes areas with a high intrinsic potential to provide critical habitat for those populations. Stronghold areas within the Columbia Basin are being identified and designated, with local support, by the North American Salmon Stronghold Partnership, a broad-based partnership that includes participation by the Council and BPA.
Recommendation 9: The Program should include a request that BPA make wild salmon strongholds a focus of the Program by giving priority to or dedicating funding for habitat protection and restoration, as needed, in designated salmon and steelhead stronghold areas. This funding should not diminish other BPA funding program commitments but would provide additional funds for projects and activities that benefit stronghold areas and are identified in salmon recovery or subbasin plans, subject to independent science review.

Part II. Washington Department of Ecology (Ecology) Recommendations: Columbia Basin Water Transactions Program (CBWTP)

The National Fish & Wildlife Foundation (NFWF) has provided strong direction and support for the CBWTP. Their leadership has been critical to the function of the program.
Recommendation 1: Ecology recommends that BPA continue to contract with NFWF to support the CBWTP.

The CBWTP funding of leases and purchases of water rights has increased instream flow habitat in many streams around the four-state region. Climate change has caused, and will very likely continue to cause, a trend of reduced snow pack and an earlier spring runoff. In addition, warmer temperatures associated with climate change will result in increased evapotranspiration. The effect of this will be exacerbated low flow conditions in the summer that will require more water acquisition to achieve the same net benefits.
Recommendation 2: Ecology recommends that BPA continue to provide funds for CBWTP water transactions to encourage development of innovative projects, and to support the full range of temporary and permanent transaction tools for instream flow restoration. In addition, an increase in funds will be necessary to mitigate for the expected climate change impacts to instream flows.

A growing body of knowledge about using temporary and permanent acquisitions to increase in-stream flows has resulted from the projects funded over the past five years by the CBWTP. Indeed, this program is producing valuable information for those involved in flow restoration around the Western United States. It has also been instructive for other flow restoration efforts in the Columbia Basin beyond the scope of this program. It

is important to continue to fund innovative projects that explore new methods of protecting and enhancing habitat and flows.
Recommendation 3: Ecology recommends that the CBWTP continue to encourage innovation by making funds available for projects that try new approaches to increasing instream flows.

In Washington there is significant interest in water marketing and banking. Several local watershed planning groups have developed recommendations in their watershed planning documents for using water banking to encourage more efficient movement of water to a variety of new uses including instream flows. Specific mention of water banking appears in the plans from the following Columbia Basin watershed planning areas: Walla Walla, Wenatchee, Colville, Entiat, and Klickitat. In 2006, the Columbia River Basin Water Management Program (RCW 90.90) was created to provide a framework for water purchases and transfers along the Columbia River corridor. This program is also expected to function like a water bank.
Recommendation 4: Ecology recommends that the CBWTP encourage regional water marketing efforts that provide water for multiple uses including instream flows. In particular we recommend that the CBWTP foster water banking as a tool to move more water transactions forward.

The CBWTP has funded conservation easements under the pilot Riparian Conservation Easement Program. Two permanent conservation easements were funded in the Methow Subbasin. This represents an initial step by BPA and the Council in establishing a distinct land acquisition program akin to the water acquisition program.
Recommendation 5: Ecology recommends that the CBWTP continue to explore the use of conservation easements to restore riparian habitat.

Many landowners are uncomfortable separating their water right from their land. In the current market separation of the two can be an advantage or disadvantage depending on the local economy. Landowners are concerned about the effect the loss of the water right could have on the value and future use of the land. Also, it is more difficult to determine market value of water separated from the land it is attached to. For this reason, the ability to purchase the land and water together provides an advantage to the purchaser.
Recommendation 6a: Ecology recommends the CBWTP transactions include water and land acquisition packages. There are benefits to purchasing land and water together as a package. This is particularly true where the land would provide habitat benefits for critical salmonid stocks, or where the sale of a critical water right is dependent on purchase of both land and water. We also recommend a closer integration of land and water acquisition activities and a move towards an integrated land and water acquisition program.
Recommendation 6b: In order to provide maximum benefits, Ecology recommends that land and water acquisitions be targeted to fit strategically with other fish recovery parameters on the river (e.g. passage, timing, temperature, etc.).

The CBWTP continues to encourage attempts to streamline transaction requirements. However, we have found that projects require an investment of approximately $1 in

programmatic expenses, in addition to the purchase price, to produce $1 of acquired water. The high transaction costs are a result of the barriers and inefficiencies inherent in the emerging water market.

Recommendation 7: Ecology recommends that funding of the CBWTP continue to accommodate these transaction costs.

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HIGH LEVEL INDICATORS

The Council should provide an annual report, or expand on the current report on expenditures, that summarizes by key indicator what the Program has accomplished in relation to what needs to be done. These indicators help to define success, unmet needs, and provide overarching direction to RM&E as well as funding for specific Council programs. To do this, the Council must first develop high-level indicators to track the success of the Program at three levels: General Indicators, representing biological outcomes that are important but not determined or achieved solely by the Council's Program; Performance Indicators, representing those programs under the auspices of the Council's Program; and Management Indicators that track actions that contribute to success. These indicators can and should form an integrally related whole.[1] Examples of these indicators are provided below for the Council's consideration.

I. GENERAL BIOLOGICAL INDICATORS

1. Salmon and steelhead passing Bonneville Dam, 1938-2006, hatchery and wild combined plus harvest. (Sixth annual report, p. 9)
2. Abundance of adult fish in the Council's program compared to targets. (In subbasin plans.)
3. Status of key populations: Categorized as percent of total species: by healthy populations; species of concern; ESA-listed; unknown; extinct/extirpated.
4. ESA-Listed Fish: anadromous and resident
    - Population Status: Abundance, as percentage of goal (targets from recovery plans)
    - Population Status: Productivity, as percentage of goal
    - Percentage of fish mortality, by ESU, by project, by mode of passage (spill, turbine, transport)
    - Sources of Mortality: dams juvenile mortality, as percentage of goal
    - Sources of Mortality: dams adult mortality, as percentage of goal
    - Sources of Mortality: harvest, as percentage of goal
    - Sources of Mortality: predation, as percentage of goal
5. ESA recovery target (if different than sub-basin target) from ICTRT (or approved recovery plan if available); by ESU.
6. Harvest
    - Are goals met for tribal cultural and subsistence harvest?
    - Harvest of all nonlisted fish of Columbia Basin origin, ocean and in-river
    - Harvest of all listed fish of Columbia Basin origin, ocean and in-river.

II. PERFORMANCE INDICATORS

1. Hydro survival

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[1] These categories, in a rolled up or overarching sense, should match up with the respective categories used by other reporting entities (e.g., NOAA's PCSRF, Washington's Salmon Recovery Funding Board, Washington's State of Salmon report etc.) to promote consistency of description, characterization and use.

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- Survival rates through the hydrosystem for fish passing in-river.[2]
- Total juvenile survival rates through the hydro system, in-river and barged combined.[3]

2. Habitat improvement: Productivity of wild fish in the subbasins.[4]
3. Hatcheries and Harvest
   - Number fish harvested for each hatchery (coded wire tag data and other sources)
   - Total cost per fish (adult and juvenile).
   - Number and percent of listed fish taken in mixed stock fishery.
   - Conservation hatcheries: Relative fitness of supplemented stocks.
4. Resident Fish
   - Population and harvest of hatchery fish (in the Program).
   - Population and harvest of wild fish (in the Program).
   - Productivity improvements for wild fish where habitat is improved.
5. Wildlife: Wildlife habitat units by dam: lost & acquired. (Sixth annual report, p. 13)

III. MANAGEMENT INDICATORS

1. Percent of F&W Budget addressing Species of Concern or ESA-listed Species
2. Habitat funding needed (from sub-basin plans or approved recovery plans). [how much spent; how much needed]
3. Fish and Wildlife Project Funding, by category
   - Protection
   - Restoration
   - Combined protection and restoration
   - Monitoring and Evaluation
   - Research
   - Coordination and Administration
4. Percent of Projects passing ISRP Review
5. Percent of Projects Adequately Reporting on Accomplishments: Implementation and Biological Benefits

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[2] For example, in-river juvenile survival from Lower Granite to Bonneville dams as reported in the Sixth Annual Report, p. 10. 1966-1980, 1997-2006. This is currently reported for Snake River Spring Chinook and Steelhead but there should be more species. Should also have similar survival estimates for adults.

[3] It is assumed that fish will not be barged unless their overall survival, smolt to adult return, is greater than fish migrating in-river. As long as this is true, this indicator, combined juvenile survival through the hydro system, is a useful performance indicator.

[4] This is measured by the smolt to spawner ratio for fish targeted in the program. It is an indicator of fecundity and health of the watershed. We would expect to see this productivity measure increase if habitat improvements are benefiting wild fish populations. In order to calculate this indicator we will need to count adult spawners and juvenile outmigrants.

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- Completed, implemented as proposed; biological benefits achieved
- Unreported; biological benefits unknown
- On-going; biological benefits pending
- Not Implemented as proposed; biological benefits not achieved

6. Summary of management actions in response to inadequate reporting: project terminated, project renewed, conditioned approval
7. Hydropower:
    - Council funded projects producing biological benefits (percent increase in biological survival relative to a survival target)
9. Habitat Improvement:
    - Fish Passage Barriers Corrected and Stream Miles Opened (WA, State of Salmon 2006, p.12)
    - Acre-feet of Water Restored to Streams (WA, State of Salmon 2006, p.13)
    - Acres Acquired for Salmon Restoration (WA, State of Salmon 2006, p.14)
    - Restored tributary habitat (miles, and as percent of total needed in sub-basin plans)
    - Restored estuary habitat acres (miles, and as percent of total needed in sub-basin plans)
    - Tributary habitat acquisition/easements acres and stream miles (miles, and as percent of total needed in sub-basin plans)
    - Estuary habitat acquisition/easement acres (miles, and as percent of total needed in sub-basin plans)
    - Fixed passage barrier (number of barriers, # of miles opened up, as percent needed)
    - Irrigation screens installed (number; percent of total needed)
    - Water acquisition (cfs, as percent of total needed)
    - Water quality (as percent of total impaired quality projects needed)
10. Hatcheries:
    - Projects implementing ESA-compliant goals (HSRG; Section 7 Consult; percent of total needed.)
11. Harvest:
    - Selective fisheries (percent of fisheries subject to selective fishing)
12. Predation:
    - Projects producing biological benefits (percent of fisheries subject to predation)