

# **Executive Summary**

## **Biological Assessment**

**Effects of Federal Columbia River Power System  
and Mainstem Effects of Other Tributary Actions  
on Anadromous Salmonid Species Listed under the Endangered Species Act**

## **Biological Assessment**

**Bureau of Reclamation Operations and Maintenance  
in the Snake River Basin above Brownlee Reservoir**

## **Comprehensive Analysis**

**Federal Columbia River Power System  
and Mainstem Effects of Upper Snake and other Tributary Actions**



**U.S Army Corps of Engineers**  
Northwestern Division

**Bonneville**  
Power Administration



**U.S. Department of the Interior**  
**Bureau of Reclamation**

**August 2007**

Executive Summary for the

Biological Assessment for Effects of Federal Columbia River Power System and  
Mainstem Effects of other Tributary Actions on Anadromous Salmonid Species  
Listed under the Endangered Species Act

Biological Assessment for Bureau of Reclamation Operations and Maintenance in  
the Snake River Basin above Brownlee Reservoir

And

Comprehensive Analysis of the Federal Columbia River Power System and  
Mainstem Effects of Upper Snake and other Tributary Actions

U.S. Army Corps of Engineers  
U.S. Bureau of Reclamation  
Bonneville Power Administration

August 2007

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## ACRONYMS AND ABBREVIATIONS

APA	Administrative Procedures Act
BA	Biological Assessment
BiOp	Biological Opinion
BMP	best management practice
BPA	Bonneville Power Administration
CA	Comprehensive Analysis
COMPASS	Comprehensive Fish Passage
Corps	U.S. Army Corps of Engineers
DPS	Distinct Population Segment
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FCRPS	Federal Columbia River Power System
HYDROSIM	Hydro Simulation Program
NMFS	National Marine Fisheries Service
NPMP	Northern Pikeminnow Management Program
O&M	operations and maintenance
PA	Proposed Actions
PCE	primary constituent element
PWG	Policy Work Group
Reclamation	U.S. Bureau of Reclamation
RIOG	Regional Implementation Oversight Group
RM&E	research, evaluation, and monitoring
RPA	Reasonable and Prudent Alternative
RSW	removable spillway weir
Settlement	Nez Perce Water Rights Settlement
SRBA	Snake River Basin Adjudication
TDG	total dissolved gas
USFWS	U.S. Fish and Wildlife Service

## 1. INTRODUCTION

The Endangered Species Act (ESA) requires Federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS, also called National Oceanic and Atmospheric Administration [NOAA] Fisheries), as appropriate, to ensure actions are not likely to jeopardize the continued existence of species listed as endangered or threatened or to adversely modify or destroy their designated critical habitat. The U.S. Army Corps of Engineers (Corps), the Bureau of Reclamation (Reclamation), and Bonneville Power Administration (BPA) (collectively termed the Action Agencies) are responsible for consulting with NMFS on actions that affect the listed salmon and steelhead. The most recent ESA consultations on the operation of the Federal Columbia River Power System (FCRPS) and the Upper Snake River Projects resulted in separate biological opinions (BiOps) that were challenged in court. In both instances, the U.S. District Court of Oregon remanded the biological opinions to NMFS to correct legal deficiencies.

This Executive Summary provides a synopsis of the documents prepared for NMFS' consideration in the remand of both the 2004 FCRPS Biological Opinion (2004 BiOp; NMFS 2004) and the 2005 Upper Snake River Biological Opinion (Upper Snake River BiOp; NMFS 2005). Accompanying this Executive Summary are three documents – 1) the FCRPS Biological Assessment (BA), 2) the Upper Snake River BA, and 3) the Comprehensive Analysis (CA). The CA was prepared in response to the Court's order that the analysis of effects occurring in the Upper Snake River BiOp remand be integrated with the analysis of effects for the remand of the 2004 FCRPS BiOp to ensure a "comprehensive analysis" of the effects of the two actions on the listed species and designated critical habitat. The FCRPS and Upper Snake River projects and facilities are operated independent of each other; however, these independent actions hydrologically influence flows in the Snake and Columbia rivers.

The BAs include descriptions of the action the Action Agencies are proposing to NMFS, and a discussion of the process the Federal agencies have applied in analyzing the effects of the actions. The CA integrates the effects of the FCRPS and Upper Snake River projects to conduct a quantitative and qualitative biological analysis considering various factors in addressing the risks of extinction and prospects for survival and recovery for each Evolutionarily Significant Unit (ESU) for salmon or Distinct Population Segment (DPS, which is an equivalent term often used for steelhead).

The Court affirmed that the agencies are not required to address FCRPS and Upper Snake River actions in one BiOp and allowed for separate consultations and separate BiOps. NMFS will prepare two separate BiOps—one addressing the effects attributed to the operation of the FCRPS, and one that addresses the effects of the independent operation of the 12 Upper Snake River projects.

## 2. BACKGROUND

The Columbia River begins in Columbia Lake on the west slope of the Rocky Mountain Range in Canada and meanders over 1,200 miles before emptying into the Pacific Ocean near Astoria, Oregon. The Snake River, a major tributary of the Columbia River, originates near the Continental Divide in Yellowstone National Park in northwest Wyoming and flows 1,040 miles before reaching the Columbia River. The Columbia River and its tributaries form the dominant water system in the Pacific Northwest and are a heavily used regional resource. As the region's population increased, the U.S. Government developed storage projects to capture water from rain and snowmelt for flood control, as well as for power generation, irrigation, and other purposes. The mainstem lower Columbia and Snake River projects were designed to provide for navigation from the mouth of the Columbia to the Port of Lewiston, Idaho, as well as for hydropower generation and other purposes. These run-of-river projects have minimal storage capacity and are not considered flood storage projects.

Subsequently, the United States and Canada determined that additional storage in the upper reaches of the Columbia River would be mutually beneficial to both countries for flood control and power production. The countries signed the Columbia River Treaty in 1961. The three Canadian storage projects that were developed as part of the Treaty provide almost one-half of the water storage on the Columbia River.

The Corps and Reclamation are authorized by Congress to operate and maintain multi-purpose hydroelectric projects as the FCRPS, while BPA is responsible for the marketing and transmission of the power generated from these projects. The FCRPS comprises 14 Federal multi-purpose hydropower projects. The 12 projects operated and maintained by the Corps are Bonneville, The Dalles, John Day, McNary, Chief Joseph, Albeni Falls, Libby, Ice Harbor, Lower Monumental, Little Goose, Lower Granite, and Dworshak dams. Reclamation operates and maintains Hungry Horse Project and the Columbia Basin Project, which includes Grand Coulee Dam. Congress authorized the construction of the FCRPS projects and directed the Corps and Reclamation to operate and maintain these projects for multiple purposes, including flood control throughout the Columbia River Basin; navigation in the Columbia and Snake rivers; hydropower generation to serve the Pacific Northwest; irrigation; fish and wildlife; water quality; municipal and industrial water supply; and recreation. In addition, the FCRPS BA addresses the mainstem Columbia River effects of the operations of several other Reclamation projects. The tributary effects of these separate Federal actions are currently being addressed by Reclamation in other ESA consultations.

Reclamation is the Action Agency in the Upper Snake River consultation involving the operations of 12 Federal projects, collectively referred to as the Upper Snake River projects. These projects are the Minidoka, Palisades, Michaud Flats, Ririe, Little Wood River, Boise, Lucky Peak, Mann Creek, Owyhee, Vale, Burnt River, and Baker Projects. The Upper Snake River Proposed Actions (PA) are authorized, funded, or carried out by Reclamation by virtue of Congressional or Secretarial authorizations, Congressional appropriations, and contracts with Reclamation. Reclamation received authorization for each of its projects from either Congress or the Secretary of the Interior, who had authority under the 1902 Reclamation Act to approve construction after a finding of feasibility. The Congressional and Secretarial authorizations state the purposes to be served by each project. Most of the projects are authorized for the primary purpose of irrigation. Other specific legislation authorizes some storage facilities to be used for various combinations of local flood control, hydropower generation, recreation, and fish and wildlife purposes.

## **2.1 FCRPS CONSULTATION**

The first anadromous fish species to be listed by NMFS in the Columbia River Basin was the Snake River sockeye salmon, listed on November 20, 1991. Since then, the Action Agencies have initiated numerous ESA Section 7 consultations to address the effects of the operation and maintenance of the FCRPS projects. The most recent NMFS BiOp issued on the operation of the FCRPS was the 2004 FCRPS BiOp. In 2005, the Court found this BiOp flawed and ordered NMFS to make a jeopardy determination in its FCRPS BiOp that complies with the ESA and address the following deficiencies: 1) improper segregation of the elements of the proposed action NMFS deems to be nondiscretionary; 2) improper comparison, rather than aggregation, of the effects of the proposed action on the listed salmon and steelhead; 3) flawed critical habitat determinations; 4) jeopardy determination that did not adequately address the effects of the proposed action on both recovery and survival; and 5) improper reliance on mitigation measures that were not reasonably certain to occur.

Further, the Court ordered NMFS and the Action Agencies to collaborate with sovereign States and Tribes to develop items to be included in the FCRPS proposed action, clarify policy issues, and reach agreement or narrow the areas of disagreement on scientific and technical information. The parties to the FCRPS Remand Collaboration Process are NMFS, the Action Agencies, four states (Idaho, Montana, Oregon, and Washington), and Native American Tribes (the Nez Perce Tribe, the Confederated Tribes of

the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Colville Reservation, the Spokane Tribe of Indians, and Kootenai Tribe of Idaho. NMFS and the Action Agencies filed quarterly status reports with the Court throughout the Collaboration.

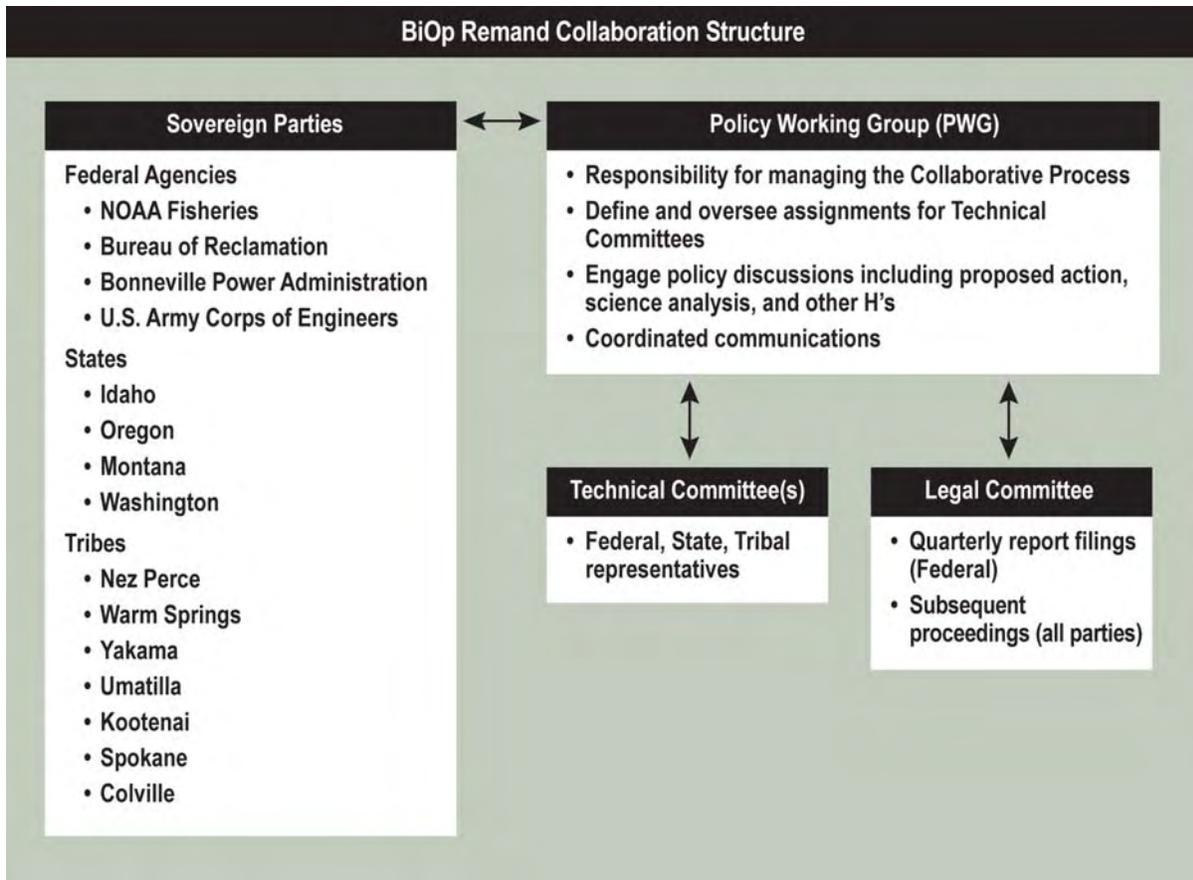
A goal of the collaborating sovereign parties was to identify actions for salmon recovery to be used by the Action Agencies' in developing a Proposed Reasonable and Prudent Alternative (RPA), and also for use by sovereign parties in coordinating regional salmon recovery efforts. This collaboration effort included extensive meetings among sovereign parties managed by a Policy Working Group (PWG). These discussions included the *Conceptual Framework for the Remand Process including the Jeopardy Analysis* (submitted to the Court with the first quarterly status report). The Conceptual Framework anticipated using the survival "gaps" estimated by the Interior Columbia Basin Technical Recovery Team (TRT) as being needed to achieve long-term recovery/viability. The Conceptual Framework was intended, among other things, to "provide a clear and complementary link to ongoing recovery planning efforts." As such, it can be understood to represent the Collaboration parties' view of the appropriate contribution of the FCRPS toward long-term recovery of the listed ESUs in the interior Columbia River Basin. Therefore, it provides a basis for use in considering the impacts of the FCRPS Proposed RPA on a listed species' prospects for recovery. The Framework comparison for interior Columbia River Basin ESUs can be found in Chapters 4 through 5 and 7 through 10 of the CA.

The FCRPS BA reflects the collaborative development of actions for incorporation into the Proposed RPA. The agencies have generally returned to the approach used in the 2000 BiOp (NMFS 2000), paying particular attention to ensuring that the proposed actions satisfy the reasonably certain to occur standard.

Although substantial improvements have been made in the operation and configuration of the hydrosystem, and survival rates at the projects have improved significantly, the existence and operation of the FCRPS alone is likely to result in a jeopardy finding for all ESUs unless improvements are undertaken in tributary and estuary habitat, predator management, and hatcheries management. Accordingly, rather than engaging in the usual iterative process of submitting a proposed hydro operation and then having NMFS suggest mitigation in the form of a RPA, the Action Agencies have instead proposed a RPA that includes the hydro operation and a full mitigation package, developed in collaboration under the remand.

By the Action Agencies obtaining input through the Remand Collaboration on development of the RPA prior to NMFS' draft BiOp on the action, they ensure that the Court's remand directions are honored, i.e., the Federal agencies collaborate with the sovereign entities in developing the proposed action. Finally, this approach also addresses the Court's concern in *American Rivers v. NOAA Fisheries* regarding possible differences between the "certainty" requirements for a RPA versus a proposed action. This Proposed RPA can be implemented consistent with intended purposes of the operation and maintenance of the FCRPS projects, is within the scope of the Action Agencies' legal authority and jurisdiction, and is economically and technologically feasible.

The Action Agencies believe that the Proposed RPA reflects the significant input received from the Collaboration parties, addresses uncertainties in the related analysis through adaptive management principles and actions, and meets the ESA § 7 (a)(2) requirements.



## 2.2 UPPER SNAKE RIVER PROJECTS CONSULTATION

In November 2004, Reclamation submitted a BA to NMFS describing 12 separate actions involving operations and routine maintenance at 12 Federal projects located upstream of Brownlee Reservoir. Reclamation initiated consultation because the existing BiOp expired before the start of the 2005 irrigation season, and some components of the proposed actions differed from the actions consulted on in the previous consultation. Most notable was the development of the Nez Perce Water Rights Settlement that described the conditions for continued provision of salmon flow augmentation from the Upper Snake River. Reclamation received a BiOp from NMFS in March 2005 (2005 Upper Snake River BiOp). The 2005 Upper Snake River BiOp concluded that Reclamation’s proposed actions were not likely to jeopardize the continued existence of 13 Columbia River Basin salmon ESUs and steelhead DPSs listed or proposed for listing under the ESA, or to adversely modify or destroy designated critical habitat for three ESUs.

In 2005, American Rivers et al. filed a suit alleging ESA and Administrative Procedures Act (APA) violations regarding the 2005 Upper Snake River BiOp (*American Rivers et al. v. NOAA Fisheries*). In May 2006, the U.S. District Court of Oregon held the BiOp analysis was flawed, and in September 2006, remanded to NMFS detailing how Federal defendants must revise the consultation to correct these deficiencies. The Court further ordered the analysis of effects occurring in the Upper Snake River BiOp remand be integrated with the analysis of effects for the remand of the 2004 FCRPS BiOp to ensure a “comprehensive analysis” of the effects of the two actions on the listed species and designated critical habitat.

Reclamation prepared its current BA to analyze its proposed actions consistent with the Court's findings and to assist NMFS with the preparation of a BiOp that will comply with ESA and satisfy the direction given by the Court. The BA builds on and updates as appropriate information contained in the 2004 Upper Snake River BA (Reclamation 2004), incorporating by reference factual information and replacing the analyses in accordance with the Court's Opinion. This BA proposes refinements to some of its proposed actions for the purposes of benefiting listed fish and designated critical habitat. Analytical information is also provided to supplement or update information provided in the 2004 Upper Snake River BA.

## **2.3 COMPREHENSIVE ANALYSIS OF THE EFFECTS OF THE OPERATION OF THE FCRPS AND UPPER SNAKE RIVER PROJECTS**

In accordance with the Court order to ensure a "comprehensive analysis" of the effects of the two separate actions on the listed species and designated critical habitat in the lower Snake and Columbia rivers, the Action Agencies have considered the combined effects of (a) the operation and maintenance of the FCRPS; and (b) the operation and maintenance of Reclamation's Upper Snake River projects.

In conducting the comprehensive analysis, the Action Agencies specifically addressed the Court's concerns as follows: 1) the analysis of the action makes no distinction between discretionary and non-discretionary actions; 2) the effects of the action are considered within the context of other existing human activities that impact the listed species; 3) critical habitat is considered in the context of life cycles and migration patterns; any actions on which the Action Agencies rely to improve safe passage are reasonably certain to occur; 4) the jeopardy analysis expressly considers the prospects for recovery; and 5) for mitigation measures upon which it relies for benefits the agencies provide specific plans as well as a clear, definite commitment of resources. Actions that the Action Agencies intend to take but that may seem less certain were not included as quantitative benefits in the analysis.

During the FCRPS Remand Collaboration, various States and Tribes identified recovery actions that they provided to the Action Agencies as actions that were reasonably certain to occur. These actions are included in the cumulative effects analysis (CA Chapter 17).

## **3. FCRPS BIOLOGICAL ASSESSMENT**

The 2007 *Biological Assessment for Effects of Federal Columbia Power System and Mainstem Effects of Other Tributary Actions* describes the Action Agencies' Proposed RPA (Section 2 of the FCRPS BA), the Effects and Analysis of the Proposed RPA (Section 3), and an Assessment of Effects on Essential Fish Habitat (Section 4). The FCRPS Proposed RPA is described below.

The Proposed RPA includes an adaptive management approach (Section 2.1 of the FCRPS BA) with specific actions in the following areas: hydropower (Section 2.2); habitat (Section 2.3); hatcheries (Section 2.4); harvest (Section 2.5); predation management (Section 2.6); and research, monitoring, and evaluation (Section 2.7). In addition, a summary table (Proposed RPA Table) that itemizes the objectives, strategies, specific actions, implementation plans, annual progress reporting, and comprehensive evaluations for each resource area is provided in Section 2.8. The following further describes the Proposed RPA.

### **3.1 ADAPTIVE MANAGEMENT**

As in the 2000 and 2004 BiOps, the Action Agencies proposed an adaptive management approach. Commitments to specific actions are reinforced by a performance-based framework that will help the Action Agencies track and gauge the effectiveness of specific actions, as well as inform adaptive

management actions. Specific to the adaptive management approach are performance standards, reporting, contingencies, and oversight of implementation.

### 3.1.1 Performance Standards

The Action Agencies have identified performance *measures* (metrics) that will be monitored and evaluated relative to performance *standards* (benchmarks) and performance *targets* (longer-term goals) to assess progress of actions and inform future decisions.

- Performance *standards* will be monitored frequently to ensure accountability and adherence to the FCRPS Proposed RPA with potential contingencies or other time-critical corrective actions.
- Performance *targets* will be evaluated over longer time periods as new information and learning is applied through analytical models to check for progress toward expected life stage survival improvements and trends in population performance. Performance targets will inform longer-term adaptive management decisions and prioritization of options across populations with different relative needs.

The Action Agencies will monitor two aspects of performance:

- *Programmatic* performance standards, tracked through project implementation and compliance monitoring, and
- *Biological and Environmental* performance standards or targets, tracked and evaluated through status monitoring, action effectiveness research, and critical uncertainty research in combination with existing and developing quantitative models.

### 3.1.2 Reporting

The Action Agencies will provide a transparent and regular examination of their performance under the new FCRPS BiOp, using implementation plans, annual progress reports, and comprehensive evaluations.

- **Implementation plans** will describe the tributary and estuary habitat actions that will be funded during the 2010 to 2012, 2013 to 2015, and 2016 to 2017 periods. The Action Implementation Plans will also detail any changes in hydro; predation management; hatchery; or research, monitoring, and evaluation (RM&E) from the actions described in the FCRPS BA for each time period.
- **Annual Progress reports** will describe the status of implementing all RPA actions as of the end of the previous calendar year. In addition to RPA action implementation status, the Annual Progress Reports will describe the status of physical or biological metrics monitoring. The results of the progress reports will inform adjustments in future year actions through adaptive management.
- The **Comprehensive Evaluations** will review all implementation activities through the end of the previous calendar year and compares them to scheduled completion dates as identified in the BA or modified in the Implementation Plans. They will also describe the status of the physical and biological factors identified in the FCRPS BA, and compare these with the expectations in the survival improvements identified in the CA. The Comprehensive Evaluation will include a discussion of the Action Agencies' plan to address any shortcomings of current estimated survival improvements as compared to the original survival estimates identified in the CA referenced in the FCRPS BA.

Comprehensive Evaluations are a tool to ensure that the Action Agencies and regional parties step back and take a comprehensive and cumulative look at implementation of FCRPS actions. This allows the opportunity to build on successes and make mid-course corrections where necessary. Comprehensive Evaluations are also a juncture to examine the broader context of recovery, looking at the status of listed fish, actions by others across the salmon lifecycle, and environmental or other changes.

A reporting schedule can be seen below.

<b>Year</b>	<b>Implementation Plans</b>	<b>Comprehensive Evaluations</b>	<b>Annual Reports</b>
2008	-	-	Sept. 2008: Report on Jan. to Dec. 2007 implementation
2009	Dec. 2009: 2010 to 2012 Implementation Plan	-	Sept. 2009: Report on Jan. to Dec. 2008 implementation
2010	-	-	Sept. 2010: Report on Jan. to Dec. 2009 implementation
2011	-	-	Sept. 2011: Report on Jan. to Dec. 2010 implementation
2012	Dec. 2012: 2013 to 2015 Implementation Plan	June 2012 Report on info. through Dec. 2011	-
2013	-	-	Sept. 2013: Report on Jan. to Dec. 2012 implementation
2014	-	-	Sept. 2014: Report on Jan. to Dec. 2013 implementation
2015	Dec. 2015: 2016 to 2018 Implementation Plan	June 2015 Report on info. through Dec. 2014	-
2016	-	-	Sept. 2016: Report on Jan. to Dec. 2015 implementation
2017	-	-	Sept. 2017: Report on Jan. to Dec. 2016 implementation

### **3.1.3 Contingencies**

Contingencies are alternative actions, plans, or approaches for addressing failure to meet performance standards. The Action Agencies have committed to explore specific contingencies they have been able to identify through coordination with States and Tribes, in advance of knowing whether they will actually need to be deployed. The Action Agencies acknowledge the need to consider other contingencies in the event that actions under this new BiOp do not prove successful, even after adaptive management. Once contingencies are identified, the Action Agencies will evaluate them for biological, economic, technical, and institutional feasibility, including legal authority.

### **3.1.4 Oversight of Implementation**

The Federal agencies, States, and Tribes would like to continue to collaborate and oversee implementation of recovery actions across the salmon and steelhead lifecycle. Acknowledging the value gained from the Remand Collaboration PWG, the Action Agencies will support a Regional Implementation Oversight Group (RIOG) to oversee the implementation of the FCRPS BiOp, in aggregate with the conservation and recovery actions of others. Like the Policy Work Group, the Action Agencies recommend that the RIOG consist of senior policy representatives, representing Federal, State, and Tribal sovereigns.

## 3.2 HYDROPOWER

The following figure identifies the proposed Hydropower implementation strategies and actions. A full discussion of Hydropower can be found in Section B.2.1 of the FCRPS BA.

The Action Agencies have developed a Hydropower Action that includes water management operations; juvenile and adult dam passage modifications; operation improvements for spill and transport of juvenile fish; and operational and maintenance activities aimed towards improving juvenile passage survival and adult returns. Other Actions associated with multipurpose operations of the FCPRS (that are also part of the Proposed RPA) are as described in Section B.1 of the FCRPS BA and its associated attachments.

Water management actions recognize that available storage—water that actually can be managed—is limited relative to total annual runoff in the Columbia River Basin. The Action Agencies will operate the FCRPS storage projects (Libby, Hungry Horse, Albeni Falls, Grand Coulee and Dworshak projects) for flow management and the FCRPS run-of-river mainstem lower Columbia River and Snake River projects (Bonneville, The Dalles, John Day, McNary, Ice Harbor, Lower Monumental, Little Goose and Lower Granite projects) to minimize water travel time through the lower Columbia and Snake rivers to aid in juvenile fish passage. Specific operations for each storage project are identified in Table B.2.1-1 of the FCRPS BA. Included in this strategy are actions to coordinate with Canada on Treaty and Non-treaty storage, dry water year operations, and operations and actions to address water quality.

The Corps will continue to operate and maintain facilities at the mainstem projects to continue to provide for safe passage conditions. Modifications to improve juvenile and adult passage facilities are proposed to continue. A key component of this strategy is implementation of surface passage improvements such as removable spillway weirs (RSWs). Specific Actions at each of the mainstem Columbia and Snake River projects can be found in Section B.2.1.

The Action Agencies will provide spill to improve juvenile fish passage, while avoiding high total dissolved gas (TDG) supersaturation levels or adult fallback problems. The dates and levels for spill may be modified through the implementation planning process and adaptive management decisions. The initial levels and dates for spill operations are identified in the FCRPS BA, Table B.2.1-14. The Action Agencies will continue to evaluate and optimize spill and passage survival to meet the hydrosystem performance standards and the requirements of the Clean Water Act.

The overall intent of the proposed juvenile transportation operation is to balance transportation and in-river migration benefits, across the season and among the various species of fish, and maximize adult returns for all species passing the collector projects. The Corps and BPA will continue to collect and transport juvenile fish at Lower Granite, Little Goose, Lower Monumental, and McNary dams, although under a modified operation.

Further details of the proposed transportation program can be found in Tables B.2.1-15 and B.2.1-16 of the FCRPS BA.

**Action Agencies' Hydro Action Approaches to Improve Juvenile and Adult Fish Survival in the FCRPS**

**Hydro Strategy 1**  
**Operate the FCRPS to More Closely Approximate the Shape of the Natural Hydrograph to Enhance Flows and Water Quality to Improve Juvenile and Adult Fish Survival**

- Action 1 Storage Project Operations
- Action 2 Lower Columbia and Snake River Operations
- Action 3 In-Season Water Management
- Action 4 Forecasting
- Action 5 Operational Emergencies
- Action 6 Fish Emergencies
- Action 7 Columbia River Treaty Storage
- Action 8 Non-Treaty Storage Refill
- Action 9 Non-Treaty Long-Term Agreement
- Action 10 Non-Treaty Coordination with Federal Agencies, States, and Tribes
- Action 11 Dry Water Year Operations
- Action 12 Water Quality Plan for Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers
- Action 13 Tributary Projects

**Hydro Strategy 2**  
**Modify Columbia and Snake River Dams to Maximize Juvenile and Adult Fish Survival**

- Action 14 Configuration and Operational Plan (COP) for Bonneville Project
- Action 15 COP for The Dalles Project
- Action 16 COP for John Day Project
- Action 17 COP for McNary Project
- Action 18 COP for Ice Harbor Project
- Action 19 COP for Lower Monumental Project
- Action 20 COP for Little Goose Project
- Action 21 COP for Lower Granite Project
- Action 22 Chief Joseph Dam Flow Deflector
- Action 23 Turbine Unit Operations
- Action 24 Columbia and Snake River Projects Adult Passage Improvements

**Hydro Strategy 3**  
**Implement Spill and Juvenile Transportation Improvements at Columbia River and Snake River Dams**

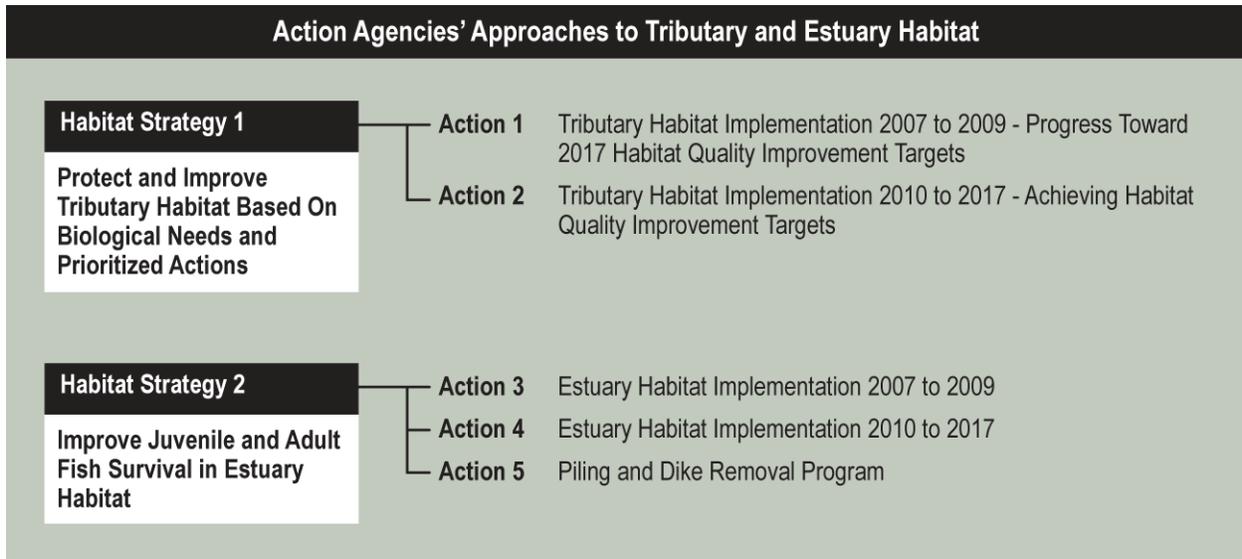
- Action 25 Spill Operations to Improve Juvenile Passage
- Action 26 Juvenile Fish Transportation in the Columbia and Snake Rivers
- Action 27 COP for Transportation Strategy

**Hydro Strategy 4**  
**Operate and Maintain Facilities at Corps Mainstem Projects to Maintain Biological Performance**

- Action 28 Fish Passage Plan

### 3.3 HABITAT

The following figure identifies the proposed Habitat implementation strategies and actions. A full discussion of Habitat can be found in Section B.2.2 of the FCRPS BA.



Tributary and estuarine habitat in the Columbia River Basin is a major component of the lifecycle of salmonids. Therefore, the objective of the Action Agencies' overall habitat strategy is to protect and improve habitat based on biological needs and prioritized actions that address limiting factors identified for each salmon ESU or steelhead DPS. Habitat protection and improvement has been an ongoing component of the recovery process and has involved completion of multiple projects throughout the Columbia River Basin.

In Columbia River Basin tributaries, the Actions Agencies will implement an expanded and better-defined tributary habitat program and commit to improve habitat quality by addressing limiting factors that impair spawning and rearing habitat for ESUs affected by the FCRPS. The primary focus of this program is on populations with the greatest biological need and where habitat potential exists. The primary types of Tributary Habitat Actions that will be implemented include:

- Increase streamflow through water acquisitions,
- Address entrainment through screening,
- Provide fish passage and access,
- Improve mainstem and side channel habitat conditions,
- Protect and enhance riparian conditions, and
- Improve water quality.

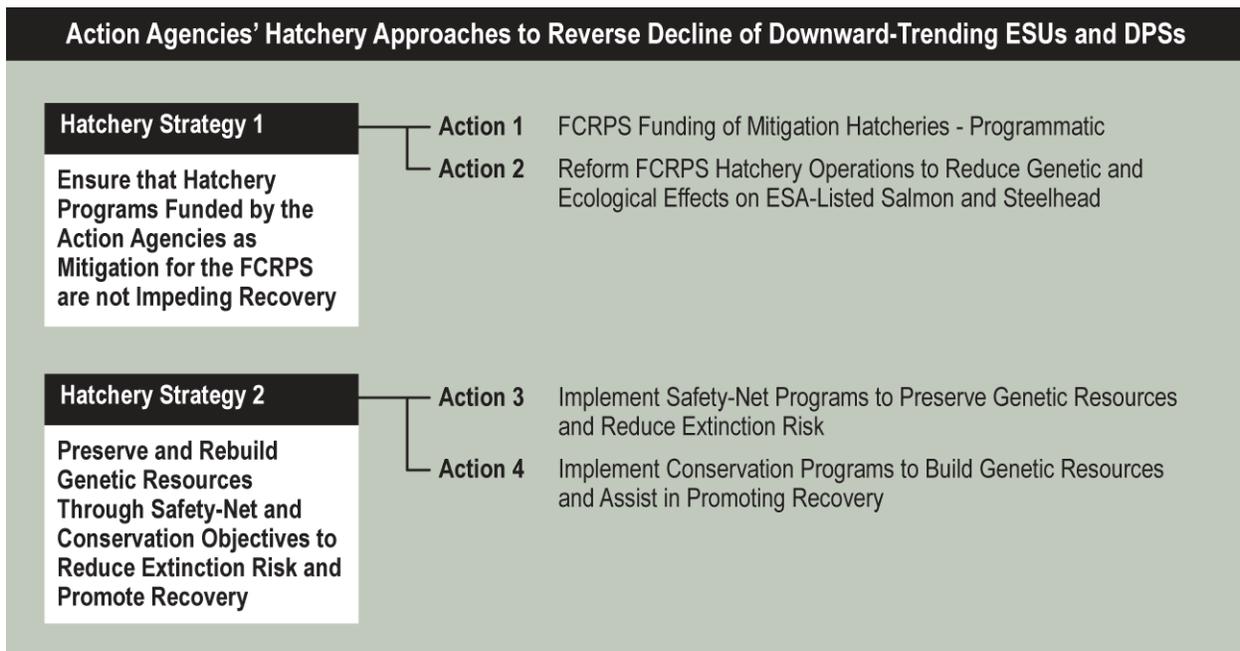
In the Columbia River estuary, the Action Agencies will implement an expanded estuary habitat program to address limiting factors involved in passage and rearing in the estuary for ESUs affected by the FCRPS. Action Agency estuary habitat projects will provide an increase in juvenile salmonid shallow water habitat and will benefit all ESA-listed ESUs. The greatest benefits will be realized by those ESUs

with ocean-type life histories that use the estuarine environment for longer periods of time. Types of Estuary Habitat Actions that will be implemented include:

- Acquire, protect, and restore off-channel habitat,
- Restore tidal influence and improve hydrologic flushing,
- Restore floodplain reconnection by removing or breaching dikes or installing fish-friendly tide gates,
- Remove invasive plants and weeds; replant native vegetation,
- Protect and restore emergent wetland habitat and riparian forest habitat,
- Restore channel structure and function, and
- Develop and implement a piling and dike removal program.

### 3.4 HATCHERY

The following figure identifies the proposed Hatchery implementation strategies and actions. A full discussion of Hatchery can be found in Section B.2.3 of the FCRPS BA.



The Action Agencies' specific objective is to fund the FCRPS Mitigation Hatchery Program in a way that ensures they do not impede recovery and, where appropriate, reduce extinction risk and promote recovery. The global objectives and strategies of the Hatchery Action for all ESUs are as follows:

- Include, as part of the ESA Section 7 Consultation with NMFS on the operation of the FCRPS:
  - programmatic consideration of the Federal Action Agencies' funding of all FCRPS hatchery programs required as mitigation for the operation of the FCRPS; and
  - the use and adequacy of the proposed funding decision criteria to reduce impacts of FCRPS hatchery programs on ESA-listed anadromous fish.

- Describe other specific hatchery actions proposed for Action Agencies' funding intended to prevent extinction, improve viability, and contribute to recovery of listed salmon and steelhead populations in the Interior Columbia River Basin including funding of these categories of actions:
  - actions to reform FCRPS hatchery programs to eliminate or reduce their impact on listed populations; and
  - safety-net programs and other types of conservation hatchery programs to prevent extinction, improve viability, and contribute to recovery of listed salmon and steelhead populations in the interior Columbia River Basin.

### 3.5 HARVEST

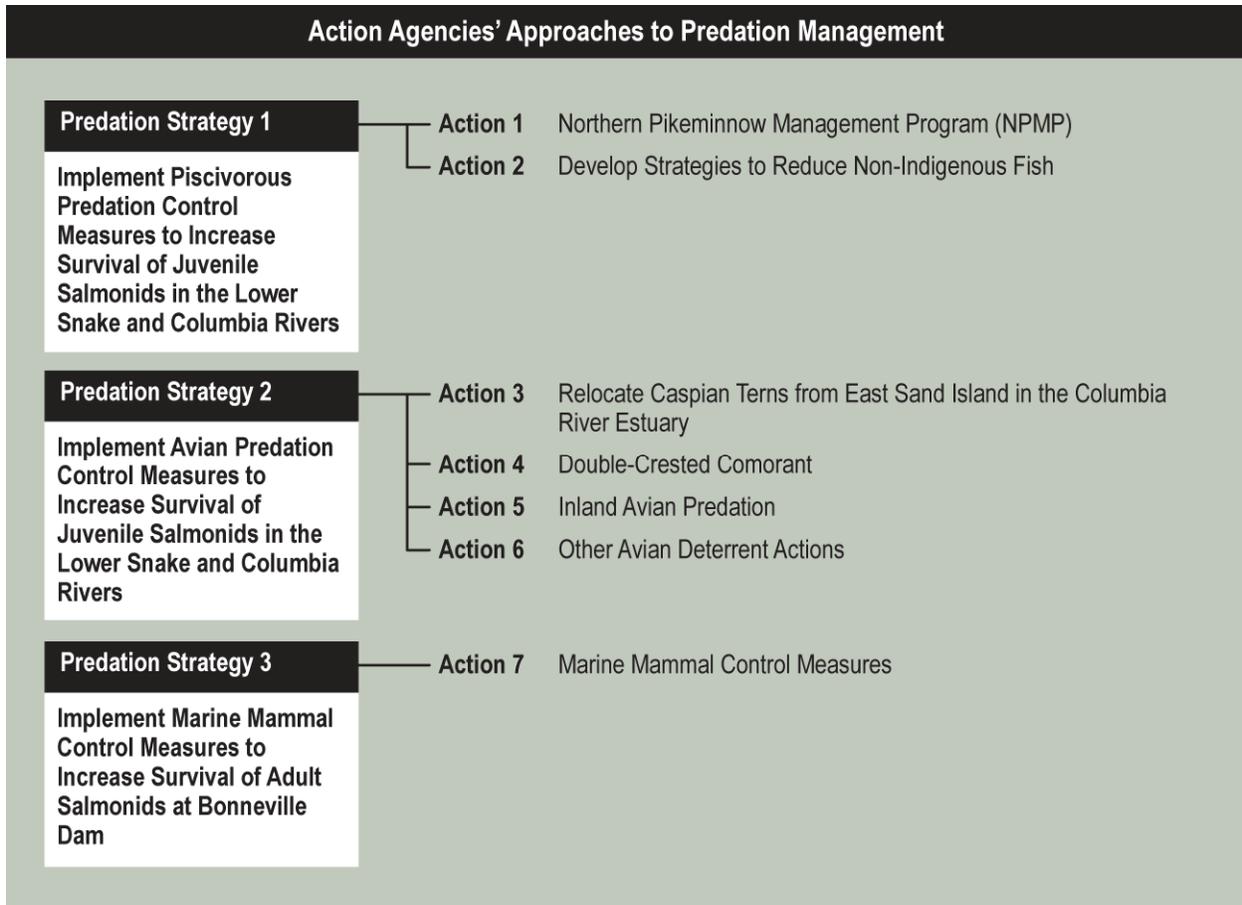
The following figure identifies the proposed Harvest implementation strategies. A full discussion of Harvest can be found in Section B.2.4 of the FCRPS BA.



The overall harvest objective for all ESUs is to improve adult life-stage survival. Harvest of ESA-listed fish species in the Columbia River Basin is primarily managed through States, Tribes, and Federal agencies other than the Action Agencies. Although the Action Agencies are not proposing any specific Harvest Actions in the RPA at this time, they will support the identification and implementation of approaches or conservation measures to reduce the effects of harvest on ESA-listed fish.

### 3.6 PREDATION MANAGEMENT

The following figure identifies the proposed Predation Management implementation strategies and actions. A full discussion of Predation Management can be found in Section B.2.5 of the FCRPS BA.

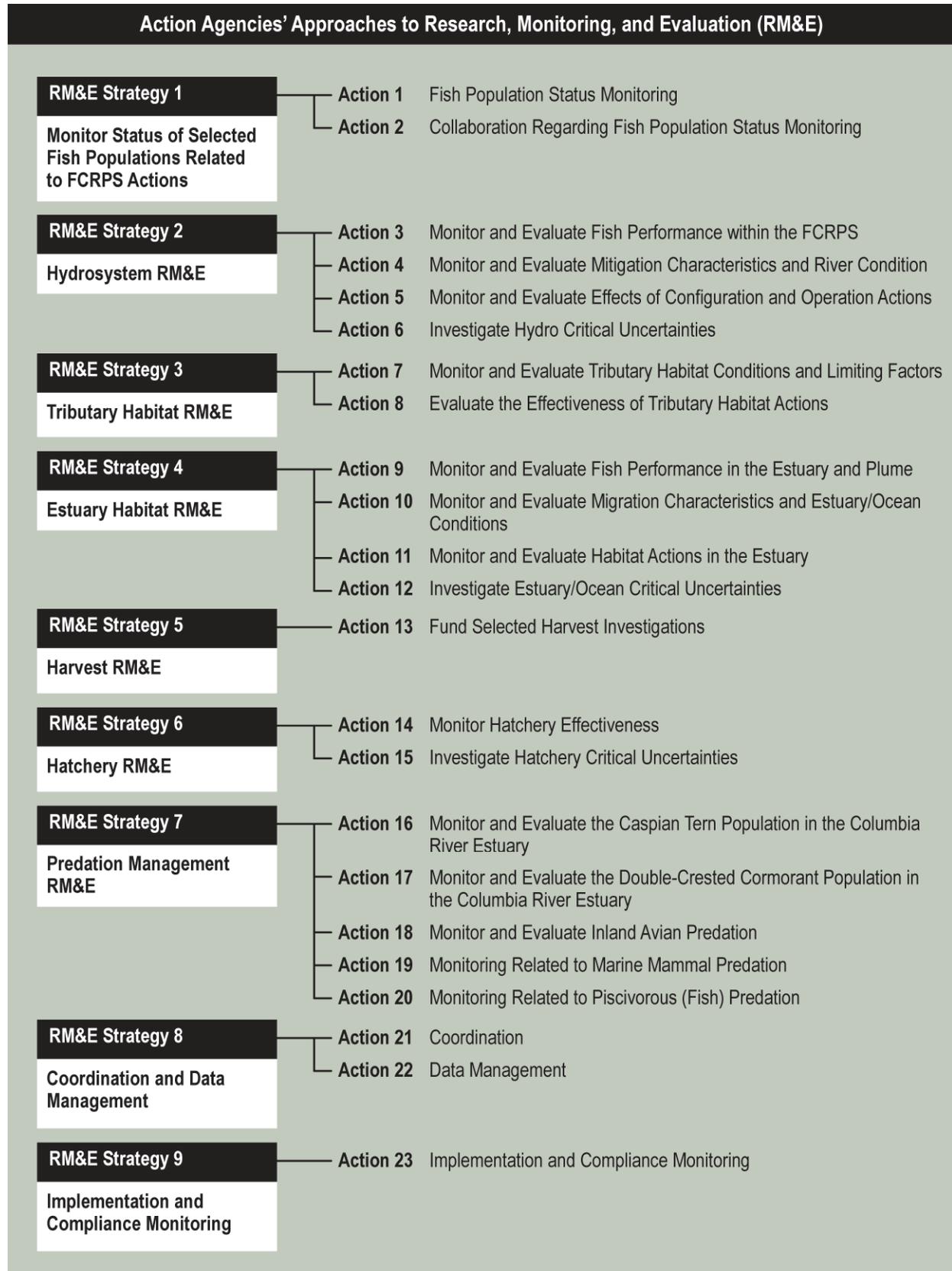


The Action Agencies are committed to providing actions that will reduce mortality from predators of ESA-listed juvenile and adult anadromous fish. As such, the Action Agencies have developed and will continue to implement predation management strategies and actions involving piscivorous fish (fish that prey on other fish), avian (birds) species, and marine mammals.

### 3.7 RESEARCH, MONITORING, AND EVALUATION

The following figure identifies the proposed RM&E implementation strategies and actions. A full discussion of RM&E can be found in Section B.2.6 of the FCRPS BA.

The overall RM&E objective is to provide information needed to support planning and adaptive management and demonstrate accountability related to the implementation of FCRPS ESA hydropower and offsite actions for all ESUs. The Action Agencies will undertake RM&E through project implementation and compliance monitoring, status monitoring, action effectiveness research, and critical uncertainties research.



## 4. UPPER SNAKE RIVER BIOLOGICAL ASSESSMENT

Reclamation has prepared the 2007 *Biological Assessment for Bureau of Reclamation Operations and Maintenance in the Snake River above Brownlee Reservoir* (2007 Upper Snake River BA) to analyze its proposed actions and assist NMFS with the preparation of a BiOp that will comply with ESA and satisfy the direction given by the Court in its orders in *American Rivers et al. v NOAA Fisheries*. The document describes 12 separate Proposed Actions (PA) associated with Federal projects located above Brownlee Reservoir, collectively known as the Upper Snake River Projects. The BA also describes the modeled hydrologic data and the qualitative analysis of the hydrologic effects of the PA for the years 2017 through 2034 on listed anadromous fish and their critical habitat.

### 4.1 UPPER SNAKE RIVER PROPOSED ACTIONS

Reclamation's 2007 Upper Snake River BA describes 12 separate proposed actions, involving operations and routine maintenance at 12 Federal projects, located on the Snake River and tributaries upstream of Brownlee Reservoir in Idaho and Oregon. The Upper Snake River proposed actions are each defined by project facilities that are located within the same drainage and are operationally coordinated. For example, the operations and routine maintenance of the facilities on the Boise drainage (Anderson Ranch, Arrowrock, and Lucky Peak Dams and Reservoirs) are defined as one separate action because the operations of these project facilities are coordinated with one another.

The Upper Snake River PA includes one or more of the following activities:

- Future storage of water in reservoirs and its release from dams that the United States owns and constructed. Storage and releases occur in accordance with authorized project purposes, Reclamation contracts, Federal law, and State water law.
- Future diversion or pumping of water into facilities that Reclamation manages or operates.
- Future hydropower generation at Reclamation power plants.
- Future routine maintenance activities at dams, reservoirs, on-stream diversion structures and pumping plants, and Reclamation hydropower plants, regardless of whether the operation and maintenance (O&M) responsibility has been transferred to another entity.
- Future provision of salmon flow augmentation by acquiring water through rental pools and leasing or acquiring natural flow rights consistent with the Nez Perce Water Rights Settlement.
- Surveys of ESA-listed aquatic snails below Minidoka Dam.

The 12 projects are authorized, funded, or carried out by Reclamation by virtue of Congressional or Secretarial authorizations, Congressional appropriations, and contracts with Reclamation. Reclamation received authorization for each of its projects from either Congress or the Secretary of the Interior, who had authority under the 1902 Reclamation Act to approve construction after a finding of feasibility. The Congressional and Secretarial authorizations state the purposes to be served by each project. Congress has directed in the Reclamation laws that Reclamation enter into contracts with project water users. These contracts set out, among other things, Reclamation's obligations to store and deliver project water to irrigation districts, municipalities, and other entities. Additionally, the 1902 Reclamation Act requires that Reclamation comply with State law with regard to control, appropriation, use, and distribution of waters. Water can only be stored and delivered by a project for authorized purposes for which Reclamation has asserted or obtained a State water right in accordance with Section 8 of the Reclamation Act of 1902 and applicable Federal law. Reclamation must honor senior or prior water rights in storing and diverting project water. Conversely, project water is protected from diversion by junior appropriators by State water masters. The active cooperation of the State water rights administrators is essential in ensuring that any water Reclamation delivers for flow augmentation or any other purpose reaches the

targeted points of delivery. Reclamation has no discretion except to deliver water in accordance with the project water rights and in accordance with State water law.

The proposed actions and facilities and features associated with the Upper Snake River projects are more fully described in Reclamation's 2007 Upper Snake River BA (Chapter 2) and supporting documents referenced in the BA. The 2004 *Operations Description for Bureau of Reclamation Projects in the Snake River Basin above Brownlee Reservoir* comprehensively describes the authorities, future operations, and routine maintenance activities.

## **4.2 FLOW AUGMENTATION**

Reclamation's Upper Snake River PA includes delivery of water to Brownlee Reservoir from storage in Reclamation projects and natural flow rights to augment flows downstream of Hells Canyon Dam to benefit listed salmon and steelhead. Reclamation has provided flow augmentation to benefit fish since 1991. The flow augmentation release regime considers the needs of the ESA-listed salmon and steelhead and other ESA-listed species including snail species in the Snake River and bull trout in the Boise and Payette River systems. Appendix C of the 2007 Upper Snake River BA provides background information on the history of Upper Snake River flow augmentation activities, sources of flow augmentation water, and the conditions associated with providing flow augmentation from the upper Snake River given the context of Reclamation's project operations and the Federal and State regulatory environment.

Emerging data on juvenile Snake River Fall Chinook Salmon migration and continued analysis of temperature data indicate that a change in timing of Upper Snake River flow augmentation releases may be desirable (see the COMPASS tables in Appendix B of the CA). Reclamation's 2007 Upper Snake River PA proposes to provide flow augmentation water earlier in the spring season, during the May to early July period, inasmuch as possible, as opposed to the current emphasis on delivery in the June to August period. Reclamation proposes to adaptively manage flow augmentation releases from the upper Snake River. If new data reveal that a different delivery schedule would better benefit listed fish, Reclamation will adapt accordingly, working with NMFS and within the context of the Nez Perce Water Rights Settlement (codified in Public Law 108-447) and described in Chapter 2 of the 2007 Upper Snake River BA.

## **4.3 NEZ PERCE WATER RIGHTS SETTLEMENT**

Longstanding disputes over water allocation were addressed by the 2004 Nez Perce Water Rights Settlement (Settlement) and the Snake River Water Rights Act of 2004 (P.L. 108-447), negotiated through adjudication proceedings for the Snake River Basin in Idaho, which began in 1987. In 1993, the United States, as Trustee for the Nez Perce Tribe, and the Tribe in its own behalf, filed water right claims in the Snake River Basin Adjudication (SRBA) for fish habitat and habitat protection, with a "time immemorial" priority date. After the initial rounds of negotiations failed to produce a settlement, the Court began proceedings on the Federal and Tribal claims in the fall of 1997. In 1998, private objectors to the Tribal claims suggested mediated negotiations, which later resulted in the Nez Perce Water Rights Settlement (Settlement) in May 2004. The United States approved the Settlement as the Snake River Water Rights Act of 2004; Idaho and the Tribe approved the Settlement on March 24, 2005, and March 29, 2005, respectively. All actions required for full implementation of the Settlement were recently completed and, in accordance with the 2004 Act, the Secretary of the Interior executed a final Statement of Findings: Snake River Water Rights Act in the Federal Register (72 FR 27325) on May 15, 2007, certifying that all conditions for effectiveness of the agreement have been satisfied.

The Settlement consists of three components: the Nez Perce Tribal, the Salmon/Clearwater, and the Snake River Flow components. The Snake River Flow component forms the foundation of the Upper Snake River PA, addressing the conditions for use of water for flow augmentation from the Snake River above

Brownlee Reservoir. The Settlement resulted in the State's extending provisions of State law authorizing the use and protection of up to 427,000 acre-feet of water for ESA-listed salmon/steelhead flow augmentation, plus an authorization for Reclamation to acquire an additional 60,000 acre-feet of consumptive natural flow water rights for the same purpose for the 30-year term of the Snake River Flow component (through 2034). These provisions improve Reclamation's ability to provide water for flow augmentation by increasing the long-term probability of obtaining 427,000 acre-feet, and in some years providing as much as 487,000 acre-feet, and by minimizing the uncertainties related to the ability to protect the water in accordance with State law. The Upper Snake River PA is consistent with the terms of the Snake River Flow component of the Settlement.

Other components of the Nez Perce Settlement also contain provisions for the purposes of benefiting ESA-listed fish, but are not part of Reclamation's Upper Snake River PA. The Nez Perce Tribal component, in addition to addressing the Tribe's consumptive water rights claims on-reservation, providing water development funds, and resolving other on and near reservation issues, gave the Nez Perce Tribe, in conjunction with an intergovernmental board that comprises the Tribe, Corps, BPA, NMFS, and the State of Idaho, use of 200,000 acre-feet of water stored in Dworshak Reservoir, located on the North Fork Clearwater River on the Reservation. This water can be used for flow augmentation and temperature control (cooling) in the lower Snake River in August and September and is intended to benefit juvenile and adult fall Chinook salmon and adult steelhead by shaping cool flows into September. The Salmon/Clearwater component provides fish habitat protection throughout the Salmon and Clearwater River basins through a cooperative agreement under Section 6 of the ESA that includes adoption of minimum instream flows by the State and establishment of a habitat trust fund. Appendix A in the 2007 Upper Snake River BA provides additional information about these two components of the Nez Perce Water Rights Settlement.

## **5. COMPREHENSIVE ANALYSIS**

The Comprehensive Analysis considers the biological requirements for survival and recovery of the listed species and evaluates the effects of the FCRPS Proposed RPA and the Upper Snake River PA combined with the environmental baseline (see Chapter 2 of the CA) and cumulative effects (see Chapter 17 of the CA). As such, it is a lifecycle survival analysis that necessarily considers all mortality factors affecting the listed species, as well as all actions that have an impact on the species' survival, productivity, and population growth rates.

### **5.1 ANALYTICAL APPROACH**

The general analytical strategy for assessing population status, for populations and ESUs with adequate data to support such an analytic approach, is a step-wise adjustment of population-level metrics from a historical base period to current conditions, and from current conditions to expected future status. This approach is modeled on the analytical approach used by NMFS in the 2000 FCRPS BiOp. It is also virtually identical in its step-wise approach and the time periods selected to the approach used by the Interior Columbia Basin TRT in its Interim Gaps Report.

The quantitative analysis relied on commonly used and accepted biological metrics that measure lifecycle survival, as well as estimated extinction risk under different modeling assumptions. Because the analysis proceeds from empirical estimates of average lifecycle survival over an historical period, it captures all sources and causes of salmon mortality during that period. The analysis then "adjusts" those average historical survival estimates to reflect current conditions—again, aggregating all sources of mortality as well as survival improvements into the analysis. Finally, it builds on this aggregated estimate of current survival to incorporate the effects of the FCRPS Proposed RPA and Upper Snake River PA combined with any anticipated effects of proposed Federal projects that have received ESA Section 7 consultation and the effects of State and private actions that are reasonably certain to occur. Thus, the analytical

process integrates all effects on the salmonid lifecycle into every step of the analysis. Chapter 3 and Appendix A of the CA discuss in detail the analytical approach.

The Action Agencies also considered climate change. Appendix H of the CA discusses the general temperature and hydrologic trends expected in the future, the effects these trends might have on ESA-listed salmon and steelhead, potential mitigation actions the Action Agencies might undertake to address these effects, and how to ensure that these potential actions will be undertaken, if necessary, in a timely manner.

The following sections provide an overview of the methodology used to estimate the benefits for the following actions: hydropower, habitat (tributary and estuary), hatchery, harvest, and predation management.

### **5.1.1 Hydropower**

The estimated biological effects of the hydropower actions were based on the Comprehensive Fish Passage (COMPASS) model. The inputs to the models were based on 1) the amount and timing of flow in the Snake and Columbia rivers, and 2) estimates of survival changes from mainstem dam operations and configurations modifications. For the flows, two models were used to complete the hydrologic analysis for the comprehensive analysis. One model was used for the upper Snake River above Brownlee Reservoir, and the other was used for the remainder of the Snake and Columbia River basins. Reclamation's MODSIM hydrology model (2007 version) was used to estimate the hydrologic effects and inflows to Brownlee Reservoir resulting from the existence and operation of the Upper Snake River projects and all private diversions and depletions, and is used as input into the second model. The second flow model, which is used for the lower Snake and Columbia rivers, called Hydro Simulator Program (HYDROSIM, also known as HYDSIM), was developed by BPA in the 1990s and is used to calculate flows for the various scenarios of flow operations being considered. The output of HYDSIM is then used for survival models of fish passage that utilize flow as one of the parameters. The overall results of the hydroreg modeling are presented in Appendix B of the CA.

Estimates of the survival changes from modifications in mainstem dam operations and configurations were based on empirical studies using the best available data and professional judgment. The COMPASS model results were used to estimate survival under the FCRPS Proposed RPA and Upper Snake River PA to comparatively assess the relative effects of survival change of the current operations to base operations, and prospective operations to current operations. The overall results of the COMPASS modeling and the effects of system survival are presented in Appendix B of the CA.

Currently, the Action Agencies do not have the ability to complete COMPASS modeling for Snake River fall Chinook or sockeye salmon due to their complex life history attributes or general lack of information for input into the model. Therefore, hydropower improvement actions at the projects were not quantified as to their improvements for either ESU. It is anticipated that hydro actions to assist other upper river ESUs also will likely improve lifecycle survival for Snake River fall Chinook and sockeye salmon. For the lower Columbia River and Willamette River populations, most occur downstream of Bonneville Dam and currently little information is available to assess relative effects of prospective actions associated with fish passage. Also, it is not possible at this time to assess comparative improvements because no COMPASS model is available for these ESUs.

### **5.1.2 Tributary Habitat**

The Action Agencies estimated survival benefits attributable to Tributary Habitat Actions that are or will be implemented in partnership with States, Tribes, and others with funding and/or technical assistance from the Action Agencies. The Action Agencies applied two main approaches to use data and

information from the Remand Collaboration Habitat Workgroup to produce survival estimates for salmon and steelhead populations. Further detail on the procedures and components utilized are presented in Appendix C of the CA. Both approaches are based on the linkages between improvements to limiting factors, improvements to habitat quality, and survival improvements.

The Actions identified represent an increase in Action Agencies' tributary habitat efforts compared to efforts for the 2000 and 2004 FCRPS BiOps.

### **5.1.3 Estuary Habitat**

The details of the proposed Estuary Habitat Action and how benefits were determined are presented in Appendix D of the CA. Degradation of estuary habitat is a limiting factor and projects that would increase shallow water habitat in the estuary would benefit listed species. Given the level of understanding of the estuary at this time, survival benefits were analyzed for ocean and stream-type life history and not at the population level. Ocean-type juveniles, such as Snake River Fall Chinook Salmon, are more likely than stream-types to benefit from the shallow-water habitat improvements that most estuary projects would create. The survival benefits associated with the specific Actions were determined by ESU.

### **5.1.4 Hatchery**

Hatchery programs may have negative effects on the viability of natural salmon and steelhead populations. Improving overall management, including the use of best management practices (BMPs) and site-specific additional actions, is intended to eliminate or reduce negative effects to these native stocks.

The Hatchery/Harvest Workgroup participants assigned a qualitative "High," "Medium," or "Low" value, based on their best professional judgment, to the expected benefits of the Hatchery Actions during and after the period of the BiOp. Hatchery/Harvest Workgroup members also indicated which population viability parameters (i.e., abundance, productivity, spatial structure, and diversity) would be positively affected by the action. These values, whenever available, were used in the Action Agencies' benefits summary tables and considered qualitatively in the Action Agencies' biological analysis. Furthermore, for certain populations, it was possible to quantitatively estimate the survival improvements that resulted from past or prospective hatchery reforms, specifically reforms involving significant improvements in broodstock management protocols. More detail on the methods used for these estimates can be found in Appendix E of the CA. The explanations of where and how this method was used can be found in Chapters 6 and 9 of the CA.

### **5.1.5 Harvest**

Estimates of survival changes associated with past changes in harvest management were supplied by Anthony Nigro of the Oregon Department of Fish and Wildlife on behalf of an ad hoc technical workgroup, representing certain of the parties in the *U.S. v. Oregon* process. The spreadsheets supplied by the workgroup are included in Appendix G of the CA. These estimates were used in the base-to-current adjustment of the analyses for Snake River Spring/Summer Chinook Salmon, Upper Columbia River Spring Chinook Salmon, Snake River Steelhead, Upper Columbia River Steelhead, and Mid-Columbia River Steelhead populations.

### 5.1.6 Predation Management

In developing the overall analysis of the effects of the proposed Predation Management Action on listed anadromous fish, the Action Agencies relied on information generated from recent analyses for assessing the effectiveness from Northern Pikeminnow Management Program (NPMP) and tern relocation actions in the Columbia River estuary (Appendix F). Estimated benefits were based on studies dating back to the early 1980s that added greatly to the Action Agencies' knowledge of piscivorous predation in the Columbia River Basin and also provided a scientific basis for the NPMP. For tern relocation actions, estimates were derived and where necessary, interpolated, from estimated juvenile salmonid consumption based on research results for the period 1997 to 2006. For both the NPMP and tern relocation programs, specific actions and estimated benefits were assessed for each of the ESUs for the future condition.

## 5.2 ESU ANALYSIS AND CONCLUSION

The CA discusses the following for each of the ESUs:

- an overview of the ESU and the factors limiting its viability,
- population-level status information during the base period used for this analysis,
- analysis of the current status and provides estimates of the needed lifecycle survival improvements for individual populations to meet certain biological criteria, and
- estimated effects of the FCRPS Proposed RPA and Upper Snake River PA on salmonid survival when combined with the environmental baseline and cumulative effects.

Observations and conclusions are discussed in the CA for each ESU as follows:

Snake River Fall Chinook Salmon	Chapter 4
Snake River Spring/Summer Chinook Salmon	Chapter 5
Snake River Sockeye Salmon	Chapter 6
Snake River Basin Steelhead	Chapter 7
Upper Columbia River Spring Chinook Salmon	Chapter 8
Upper Columbia River Steelhead	Chapter 9
Middle Columbia River Steelhead	Chapter 10
Columbia River Chum Salmon	Chapter 11
Lower Columbia River Chinook Salmon	Chapter 12
Lower Columbia River Coho Salmon	Chapter 13
Lower Columbia River Steelhead	Chapter 14
Upper Willamette River Chinook Salmon	Chapter 15
Upper Willamette River Steelhead	Chapter 16

Chapter 17 discusses the cumulative effects of State and Tribal recovery actions that are reasonably certain to occur. Chapter 18 discusses the effects from other Federal actions that are reasonably certain to occur. Chapter 19 discusses the analysis of the effects of the FCRPS Proposed RPA and the Upper Snake River PA on designated critical habitat for salmon and steelhead in the Columbia River Basin. Additionally, Chapter 19 does the following:

- describes the range-wide status of designated critical habitat for ESUs in the Columbia River Basin, in terms of the essential features or primary constituent elements (PCEs) that are present, their current status, and the cause of their current condition;
- describes the current status of the PCEs in the mainstem and Tributary Habitat Action areas;

- assesses the effects of the proposed FCRPS RPA and Upper Snake River PA on the conservation value of the essential features and PCEs of designated critical habitat;
- discusses the cumulative effects on the conservation value of the essential features and PCEs of designated critical habitat in the action area; and
- provides conclusions based on the analysis.

The conclusions in the CA are based on an analytical process that seeks to integrate all effects on the salmonid lifecycle into every step of the analysis. Based on our assessment of the FCRPS and Upper Snake River actions and analysis of effects, considering the present and future human and natural context, the Action Agencies conclude that the net effects of the proposed actions, including the existence and operations of the dams with the proposed mitigation, meet or exceed the objectives of doing no harm and contributing to recovery with respect to the ESUs affected by the operation of the FCRPS.

## 6. NEXT STEPS

The FCRPS BA, Upper Snake River BA, and the CA are the culmination of over 2 years of work from numerous participants throughout the region. From here, NMFS will review the BAs and CA as they prepare their draft BiOps, due to the Court on October 31, 2007.

## 7. REFERENCES

- NMFS (National Marine Fisheries Service). 2000. Endangered Species Act—Section 7 Consultation, Biological Opinion. Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin. NMFS, Northwest Region, Portland, Oregon. December 21.
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- Reclamation (U.S. Bureau of Reclamation). 2004. Biological Assessment for Bureau of Reclamation Operations and Maintenance in the Snake River Basin Above Brownlee Reservoir. Pacific Northwest Region, Boise, Idaho. November.

# Executive Summary



**U.S Army Corps of Engineers**  
Northwestern Division



**Bonneville**  
Power Administration



**U.S. Department of the Interior**  
**Bureau of Reclamation**