This is not a final federal agency product. Rather, it is a pre-decisional document prepared by the Action Agencies that reflects present understandings of currently available information and analyses, and of the progression of discussions with the sovereigns in the collaborative process. Revisions and refinements are to be expected based on further discussions with the sovereigns over new and modified proposed federal actions upon which the action agencies will ultimately consult. Finally, the information in this product does not constitute an analysis of whether the identified measures would or would not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Furthermore, this document does not in any way interpret or apply the regulatory definitions of the statutory phrases "jeopardize the continued existence of" and "destruction or adverse modification."

Hatchery Proposed Action Summary

Hatchery Action Objective for All ESUs: Fund FCRPS mitigation hatchery programs in a way that contributes to reversing the decline of downward-trending ESUs and DPSs.

Hatchery Strategy 1: Ensure that hatchery programs funded by the Action Agencies as mitigation for the FCRPS do not impede recovery of ESUs or DPSs.

Performance Standards: Implementation of identified reform actions for Action Agency-funded hatchery programs

Funding Source(s): BPA direct funding agreements with the U.S. Fish and Wildlife Service, Bureau of Reclamation, and the Corps of Engineers for operation and maintenance of the Lower Snake River Compensation Plan hatchery programs**,** the Leavenworth Complex hatcheries, and three Corps of Engineers mitigation hatcheries.

Rationale: Hatchery programs may have negative impacts on viability of natural salmon and steelhead populations. Improving the overall management and operation of FCRPS mitigation anadromous hatchery programs in the Interior Columbia Basin through application of funding criteria and best management practices, on a case-by-case basis, is intended to minimize or eliminate these negative effects on listed populations. Some hatchery programs have been identified as major limiting factors for listed populations and urgently require reform or elimination of the program to improve viability and aid recovery of the affected populations. Ongoing hatchery reviews are likely to identify additional FCRPS hatchery reforms that will benefit listed stocks.

What's New: Adoption of programmatic criteria for funding decisions on mitigation programs for the FCRPS that incorporate best managements practices to lessen negative effects on ESA-listed ESUs and DPSs. The Action Agencies are undertaking reform actions in cooperation with hatchery operators to achieve the FCRPS hatchery objective.

Hatchery Actions

Action: Adopt FCRPS Hatchery Funding Criteria: The Action Agencies will adopt programmatic criteria for funding decisions on mitigation programs for the FCRPS that incorporate best management practices. Site specific application of best management practices will be defined in ESA Section 7, Section 10 or Section 4(d) consultations with NOAA to be initiated and conducted by hatchery operators with the Action Agencies as cooperating agencies.

Action: Reform FCRPS Hatchery Operations: The Action Agencies will continue to meet their FCRPS mitigation obligations and compensate for FCRPS effects but will undertake reforms to achieve the Hatchery Objective and will work with FCRPS mitigation hatchery operators to cost effectively address needed reforms of current hatchery programs.

Hatchery Strategy 2: Use safety-net and conservation hatchery programs to assist recovery of ESA-listed ESUs and DPSs

Performance Standards: Implementation of identified safety-net projects contributes to increased abundance and reduced extinction risk of target populations; conservation projects contribute to improving viability of target populations.

Funding Source(s): BPA funding for planning, design, construction, operation, and maintenance for safety-net and conservation hatchery programs under the Fish and Wildlife Program

Rationale: Populations at high risk of extinction can be preserved through artificial propagation safety-net programs until limiting factors can be addressed. Properly designed and implemented artificial propagation conservation programs can improve abundance, spatial structure, and diversity of natural spawning populations.

What's New: Significant expansion of Snake River Sockeye program and development of performance standards, exploration of options for transportation of returning adult sockeye from Lower Granite Dam to the Stanley Basin, UCR **s**pring Chinook (Methow Composite stock) reintroduction in Okanogan River, development of a mechanism or procedure to identify SR steelhead populations that may need planning for a safety-net program, construction and operation of the Northeast Oregon Hatchery project contingent upon Nez Perce Tribe's development of a NOAA-approved management plan for the hatchery program,, and assessment of CR chum salmon habitat potential and development of reintroduction strategies in selected Lower Columbia River tributaries.

Action: Implement Artificial Propagation Safety-Net Programs: The Action Agencies will continue to fund the operation of on-going "safety-net" programs that are providing benefits to ESA-listed stocks at high risk of extinction by increasing abundance and preserving genetic diversity.

Action: Implement Artificial Propagation Conservation Programs: The Action Agencies will implement conservation programs, including a significant expansion of the current Snake River Sockeye program, for ESA-listed stocks where the programs assist in recovery.

This is not a final federal agency product. Rather, it is a pre-decisional document prepared by the Action Agencies that reflects present understandings of currently available information and analyses, and of the progression of discussions with the sovereigns in the collaborative process. Revisions and refinements are to be expected based on further discussions with the sovereigns over new and modified proposed federal actions upon which the action agencies will ultimately consult. Finally, the information in this product does not constitute an analysis of whether the identified measures would or would not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Furthermore, this document does not in any way interpret or apply the regulatory definitions of the statutory phrases "jeopardize the continued existence of" and "destruction or adverse modification."

Hatchery Proposed Action– Including Programmatic Consultation

Global Objectives and Strategies for all ESUs

The global objectives of this Proposed Action are:

1. Request a Programmatic Consultation with NOAA Fisheries under Section 7 of ESA on 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 listed anadromous fish; and

2. Describe other specific hatchery actions proposed for Action Agency funding, including funding of actions to reform FCRPS hatchery programs to eliminate or reduce their impact on listed populations and funding of 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.

Hatchery Objective: Fund FCRPS mitigation hatchery programs in a way that contributes to reversing the decline of downward-trending ESUs and DPSs.

Hatchery Strategy #1: Ensure that hatchery programs funded by the Action Agencies as mitigation for the FCRPS do not impede recovery of ESUs or DPSs.

A. Action: The Action Agencies will adopt programmatic criteria for funding decisions on mitigation programs for the FCRPS that incorporate best management practices as outlined in NOAA guidance on hatchery operation and as defined in final, NOAA-approved Hatchery Genetic Management Plans (HGMPs) completed during site-specific hatchery consultations to be initiated and conducted by hatchery operators with the Action Agencies as cooperating consulting parties.

B. Action: The Action Agencies will work with FCRPS mitigation hatchery operators to cost effectively address feasible reforms of current hatchery programs.

- For the majority of FCRPS mitigation programs, the Action Agencies intend to begin implementation by working with the hatchery operators after these reforms are identified in the current Basin-wide review and reform processes – the Congressionally mandated Columbia River Hatchery Scientific Review Group (HSRG) and the U.S. Fish and Wildlife Service's hatchery review. Both of these hatchery reviews are scheduled for

completion in 2008. All implementation is expected to occur within the time period of the FCRPS BiOp.

- For FCRPS mitigation hatchery operations identified by NOAA Fisheries as currently constituting a primary concern (including a factor limiting natural viability of Interior Columbia listed populations), the Action Agencies believe that more rapid action is called for and will expedite work with the hatchery operators to address needed changes to hatchery operations. Some aspects of the Leavenworth National Fish Hatchery complex have been identified in this category.

- The Action Agencies have initiated review of the John Day Hatchery Mitigation Program.

Hatchery Strategy #2: Use safety-net and conservation hatchery programs to assist in recovery of ESA-listed ESUs and DPSs

A. Action: The Action Agencies will continue to fund the operation of on-going "safety-net" programs that are providing benefits to ESA-listed stocks at high risk of extinction by increasing abundance and preserving genetic diversity.

B. Action: The Action agencies will implement conservation programs for ESA-listed stocks where the programs assist in recovery by improving population viability.

1. Introduction

In addition to operating and maintaining the Federal Power System hydro dams, and marketing the power they produce, the action agencies fund a large number of hatchery programs as mitigation and compensation for the adverse environmental impacts caused by the construction and operation of the dams. The funding of these mitigation hatcheries is an interrelated action to the operation and maintenance of the FCRPS hydro projects, and so is being considered in the FCRPS Biological Opinion. The FCRPS BiOp remand collaboration process included a Hatchery/Harvest Workgroup (H/H Workgroup) established by the Policy Working Group. Work products from the H/H Workgroup included a hatchery effects paper, a hatchery use and benefits paper, a "Coarse Screen" of potential and continuing hatchery actions to benefit ESA listed salmon and steelhead, and an accompanying description of the ESA benefits of the actions in the "Coarse Screen." The "Coarse Screen" was divided into two categories: 1) actions approved by the policy group in the *U.S. v. Oregon* process; and 2) actions that lacked consensus of the *U.S. v Oregon* parties or were outside of the *U.S. v. Oregon* process. These work products were incorporated into the record of this consultation and are relied upon for biological effects and implementation feasibility by the Action Agencies. It should be noted that these work products of the H/H Workgroup were not consensus documents. It should also be noted that it was understood within the Workgroup that the Action Agencies intended to incorporate the documents into the record of the current consultation and to rely upon them to describe biological effects and assess the feasibility of implementing certain hatchery actions.

Programmatic Objective and Tiered Approach

The overall funding of the FCRPS mitigation hatchery program, (comprised of a number of individual production programs in hatcheries throughout the Columbia Basin) involves strategic decisions regarding the integration of this program with ESA needs and objectives, as required by law. This includes the development of long-range and short-term objectives consistent with ESA requirements, tribal rights, and other mitigation obligations and objectives and related criteria for the overall hatchery program. This consultation involves a "tiered" approach: the first tier is this current consultation at the program level, which proposes criteria for FCRPS funding of the mitigation hatchery program, including best management practices for minimizing adverse impacts to, and contributing to the survival and recovery of, listed species. This first tier consultation also evaluates the "landscape-level" effects of the continued implementation of the Action Agencies hatchery program funding decisions. This will include guidance and protocols as to how site-specific hatchery reform actions would be designed and implemented to come into compliance with the ESA. The second tier will consist of the future consultations on individual artificial production programs and site specific hatchery reform actions that will be funded by the Action Agencies and implemented during the term of the overall programmatic biological opinion. These second tier consultations will be led, in most cases by the hatchery operators, and will address reform implementation schedules, ESA Section 7 consultation and ESA Section 10 (if applicable) permitting. The Action Agencies will be kept informed of the progress of these second tier processes and will participate in any Section 7 consultations.

Although this is a new approach for the FCRPS funded hatcheries, the Action Agencies believe that a program-level consultation is advisable at this time because of the hatchery programs' links with the FCRPS operations. The FCRPS hatchery mitigation program is extensive in nature, is located across the Columbia Basin, and has potential adverse effects as well as potential benefits for ESA-listed fish. The Endangered Species Act, consultation regulations, and the joint NOAA/USFWS Section 7 Consultation Handbook allow for and describe programmatic consultation. Programmatic consultations analyze the combined effects of all the actions that make up a program, and then present that analysis and its conclusions in a single document. 'Tiered' consultation allows a programmatic analysis to include actions with similar effects where the effects cannot be fully analyzed without project-specific information. [1]

Benefits of a programmatic approach include: 1) streamlined site-specific consultation processes; 2) minimization of the potential "piece-meal" effects that can occur when evaluating individual projects out of the context of the complete basin-wide FCRPS mitigation hatchery program; 3) more cost effective integration of ecosystem/recovery planning activities with action agency and hatchery operator activities; 4) added predictability for all parties; and 5) the opportunity to improve and more efficiently integrate the Action Agencies' 7(a)(1) responsibilities at the program level.

[1] NMFS. 2003. Habitat Conservation Division Programmatic Consultation Guidance, NOAA Fisheries Service, Northwest Region, Portland, OR, May 2003.

Background of the FCRPS Mitigation Hatchery Program

As noted above, the FCRPS mitigation hatchery program is intended to provide a primary means of mitigation for the construction and operation effects of the FCRPS dams. The mitigation programs are those authorized by federal legislation to compensate or mitigate for lost salmon or steelhead production due to construction or operation of FCRPS hydroelectric facilities. These include the Lower Snake River Compensation Plan hatchery programs, now funded by BPA through a Direct Funding Agreement with the U.S. Fish and Wildlife Service (previously funded through appropriations to the U.S. Fish and Wildlife Service), the Leavenworth NFH complex hatcheries funded by the Bureau of Reclamation and BPA (through a Direct Funding Agreement with the BOR), and three mitigation hatcheries funded by the Corps of Engineers and BPA (through a Direct Funding Agreement with the COE). BPA funds are used for operation and maintenance of these programs. In addition, BPA funds planning, design, construction, operation, and maintenance for hatchery programs recommended for implementation by the Northwest Power and Conservation Council under the Fish and Wildlife Program.

The legal history of the various hatcheries that comprise the FCRPS mitigation program is a patchwork of laws and authorizations, including the Mitchell Act, various Water Resources Development Acts, Grand Coulee Dam Project, Columbia Basin Project Act, and the Northwest Power Act. The Action Agencies' funding decisions regarding these hatcheries must also be consistent with the directives of the ESA. The legal background for the FCRPS mitigation hatchery program is described in more detail in *Attachment 1*.

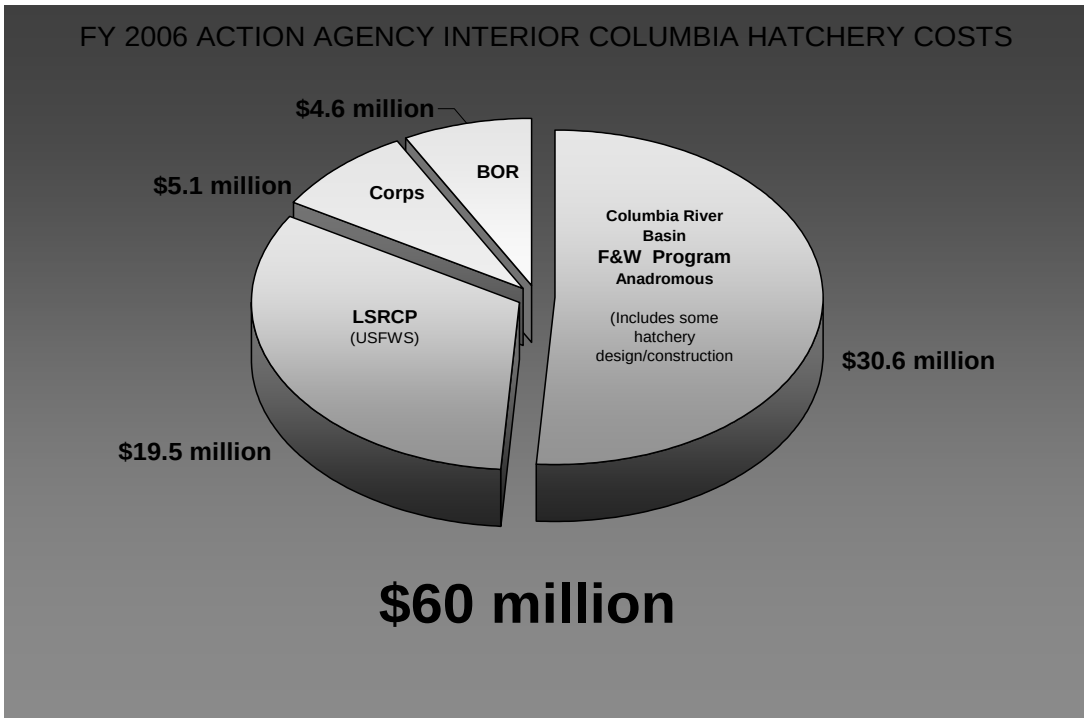

Figure 1. FY 2006 Action Agency-Funded Fish Hatchery Costs for Interior Columbia Hatcheries.

The current annual costs of the FCRPS hatchery mitigation program are:

1. BPA's FY 2006 budgeted costs for the program is shown in Figure 1.
2. Corps of Engineers' FY 2006 appropriated funding for the program is:
   - Dworshak - $472,000
   - John Day - $440,249
3. Reclamation's FY 2006 appropriated funding for the program is:
   - $340,000

The overall investment in hatcheries is large. Hatchery investments were made based on the best science at the time and under the guidance of fish and wildlife agencies. It is assumed that many reform actions could occur within this already very large ongoing investment through prioritization.

Relationship to the *U.S. v Oregon* Process

Regardless of the original purpose and current funding source for a particular Columbia River Basin hatchery, if it produces salmon or steelhead, then the parties in *U.S. v. Oregon* agree to annual production goals to support harvest. Currently, an Interim Management Agreement for 2005-2007 is in place. The parties to *U.S. v Oregon* include the Nez Perce, the Umatilla, the Warm Springs, Yakama and the Shoshone-Bannock Indian Tribes, the States of Oregon, Washington, and Idaho, and United States (represented by the U.S. Fish and Wildlife Service and NOAA Fisheries Service). The parties seek to collaboratively formulate a Columbia River Fish Management Plan (CRFM) to protect, rebuild and enhance upper Columbia River fish runs while providing harvest for both Indian and non Indian fisheries within the Columbia River basin. Since 1988, in addition to setting harvest goals, the CRFM has included artificial production targets for nearly all of the hatcheries within the Columbian Basin.

Although the Corps, Bonneville Power Administration and Bureau of Reclamation are not participants in *U.S. v Oregon*, the Agencies recognize that funding decisions made on the FCRPS mitigation hatchery program have a relationship to this court-directed process. To that end, the Agencies intend this consultation to be transparent, and to coordinate with the sovereigns, including the parties to *U.S. v Oregon* (nearly all of whom are already closely involved in the FCRPS remand). The Agencies' intent is to ensure that the FCRPS mitigation hatchery program is consistent with ESA, i.e., that the FCRPS mitigation hatcheries have ESA section 4(d), 7 or 10 authorization for operating under the ESA, and in particular, that the hatcheries are using best management practices to avoid negative impacts to ESA listed fish and, where possible, to contribute to recovery, and that their future use is consistent with ESA recovery goals. The Agencies' intent is not to re-open the existing *U.S. v Oregon* agreement that expires in 2007 at this time.

Hatchery Actions Under Previous FCRPS Biological Opinions

In both the 2000 and 2004 FCRPS Biological Opinions, the Action Agencies committed: 1) to fund safety net hatchery programs for populations at high risk of extinction; and 2) to develop Hatchery Genetic Management Plans (HGMPs) to address ESA objectives, and to implement the identified management practice reforms once the relevant HGMPs were completed and approved by NOAA; (although the HGMPS have been submitted to NOAA, they have not yet been

approved through completed Section 7 consultations); and 3) to evaluate hatchery effects on ESA-listed fish.

Current Basin-wide Hatchery Reform Efforts

There are some significant Basin-wide hatchery review and reform efforts underway that will provide specific guidance for effective hatchery reform not only of the FCRPS mitigation hatchery program, but all hatchery programs in the Columbia Basin. The Action Agencies intend to use best available science from these review efforts to fund reform actions that assist in recovery and for adaptive management of the FCRPS hatchery mitigation program consistent with the ESA. These reviews are scheduled to be completed by 2008, and as noted above, it is expected that implementation of needed reform actions will take place during the term of the FCRPS BiOp. A description of these current reviews is provided in *Attachment 2*.

2. Hatchery Action Implementation 2000-2017

The Action Agencies will continue to meet their FCRPS hatchery mitigation obligations and compensate for FCRPS effects, but will undertake reforms necessary to achieve the objectives described above. The Action Agencies will work with the hatchery operators in their development of plans to implement these reforms over the10 years of the FCRPS BiOp, sequencing by prioritized biological needs.

The Action Agencies will fund cost-effective reforms in hatchery programs to reduce negative effects of hatcheries on listed species. The specific reforms to be implemented for each program will be identified through the second tier consultation described in the Introduction. The Action Agencies will work with the operators to prioritize spending within existing budgets as a first source of funding for reforms specified in the Tier 2 consultation prior to determining whether additional funds are necessary to achieve the needed biological result.

A. Near-term Priority Actions

Near-term priority (begin planning in the first year of the Remand BiOp and implementation as soon as possible thereafter): Continue to fund ongoing safety-net and conservation hatchery programs as long as they are considered by NOAA to improve viability of target populations and benefit recovery. Reform mitigation hatchery programs identified by NOAA as currently constituting a primary concern (including a factor limiting natural viability of Interior Columbia listed populations). The Agencies consider these reforms to be the most urgently needed for recovery. Estimated benefits to productivity and recovery of listed populations are expected to be significant when these limiting factors that are reducing survival are addressed and corrected. We also propose to initiate additional conservation hatchery actions that we consider high priority.

Tables 1 -9 list ongoing safety-net and conservation programs as well as new programs proposed for Action Agency funding in each ESU or DPS.

The qualitative benefits estimates for the actions in Tables 1-9 are based on "best professional judgment" of individual participants in the Remand Collaboration Hatchery/Harvest Workgroup process. The entity, or entities, making the qualitative assessment of benefits is indicated in parentheses in the Benefit Accrued column.

Upper Columbia Steelhead and Chinook Salmon – Leavenworth NFH Complex

The Remand's Hatchery/Harvest Workgroup identified certain hatchery mitigation programs as having significant biological effects to listed stocks that, if corrected, could aid in recovery. Actions to correct these impacts are priorities and are expected to be drawn from the "Coarse Screen" list of hatchery actions developed in the Hatchery/Harvest Workgroup and reviewed by the *U.S. v. Oregon* policy group.

In collaboration with the U.S. Fish and Wildlife Service, the operator of the Leavenworth National Fish Hatchery complex (LNFH complex), the Action Agencies propose to accelerate various reforms in the operations of the Entiat National Fish Hatchery (which is part of the LNFH complex). Action A.1.2 from the "Coarse Screen" would benefit Upper Columbia River spring Chinook salmon in the Entiat River. This action discontinues release of the currently reared out-of-basin Carson stock spring Chinook salmon from Entiat NFH (which is considered to be a high risk factor) and reprogram the hatchery to rear and release 400,000 yearling summer Chinook salmon or coho salmon smolts. Other options may be considered to accomplish the same biological effect during the development of the implementation plan. This action is also consistent with recommendations in the USFWS draft report on a recent comprehensive review of the Leavenworth NFH complex.[2] Discussions with the USFWS are ongoing regarding a transition plan and the time required to phase out the existing program in view of the fact that juvenile Carson stock fish are currently on station and several broodyears of adults have yet to return. Any reform actions proposed for the LNFH complex must also be consistent with the complex's ongoing mitigation obligation for Grand Coulee Dam, and will require agreement among the fisheries co-managers. Final decisions will be made on this action following consideration and feedback by the *U.S. v. Oregon* parties on the options presented by the Action Agencies. The Action Agencies currently estimate that implementation will begin in 2008-09 if agreement is reached.

The Action Agencies are currently in discussion with USFWS regarding other hatchery reform actions that can be implemented at the LNFH complex to reduce adverse effects to listed upper Columbia River salmon and steelhead. The intent of these discussions with USFWS and others will be to work collaboratively with the regional fish managers to identify reforms that:

1. Meet the mitigation requirement;
2. Provide cost effective solutions that consider cost of implementation, long term operations, and existing maintenance issues; and

[2] Mid-Columbia NFH Assessments and Recommendations Report. USFWS Hatchery Review Team. April 2007.

3. Minimize adverse effects on ESA listed stocks consistent with the programmatic funding criteria described above.

Upper Columbia Steelhead – Other Proposed Actions

- Fund Upper Columbia steelhead kelt reconditioning. *Coarse Screen actions A.4.6, A.4.7, and A.4.8.*

- Fund development of a locally-adapted summer steelhead program in the Okanogan River. *Coarse Screen action A.3.9.*

Upper Columbia Spring Chinook Salmon- Other Proposed Actions

- The Action Agencies support the effort to explore reintroduction of spring Chinook in the Okanogan River. A proposal for this action has been made through the Coarse Screen: *Coarse Screen action B.4.6*, "Fund reintroduction of spring Chinook in the Okanogon River using Methow Composite stock." This proposal is part of the Chief Joseph Hatchery project that is currently undergoing a 3-Step Review to receive BPA funding under the Fish & Wildlife Program. The project is expected to complete Step 2 of that review in late summer 2007 and proceed to Step 3 where final design work will be completed. Assuming final Step 3 approval, construction of this new hatchery would start in FY 2009 and be completed in FY 2010. Outplanting of Methow Composite stock spring Chinook in the Okanogan River would begin in 2011.

Mid-Columbia Steelhead

- Fund Mid-Columbia (Yakima River) steelhead kelt reconditioning. *Coarse Screen action A.2.3.*

Snake River Steelhead

- As an action intended to benefit primarily Snake River B-run steelhead populations, but with potential benefits for all listed salmon and steelhead, the Action Agencies propose to work with NOAA Fisheries to identify a "trigger" for future safety-net planning or to identify any populations that may currently require safety-net planning.

  As required by the RPA in the 2000 FCRPS BiOp, BPA funded a Safety Net Artificial Propagation Program (SNAPP) project to identify additional artificial propagation safety-net programs that might be needed to prevent extinction of listed populations. The conclusion of the 2005 project report was no additional safety-nets were needed for the Snake River spring/summer Chinook populations examined, but noted that the risk of extinction for the majority of Snake River steelhead populations was unknown due to the lack of information on abundance.[3] One of the SNAPP Coordinator's recommendations in the SNAPP final report was development of a "trigger," i.e., a clearly-defined

[3] Safety-Net Artificial Propagation Program (SNAPP) Suspension Report. 2005. Final Report 2001-2005. DOE/BP-00018959-1 Available at http://www.efw.bpa.gov/Publications/A00018959-1.pdf

threshold for "excessive risk" of extinction that would initiate future artificial propagation safety net planning for populations critical to ESU recovery. The specific recommendation was to have the ICTRT develop the "trigger," possibly through modification of their population viability matrix. The Action Agencies support the development of the "trigger" and identification of any populations in immediate need of safety-net planning by NOAA Fisheries and NOAA ICTRT. In the event a safety –net plan is needed for a population, BPA will seek proposals to meet the need.

Snake River Spring/Summer Chinook Salmon

- Fund NEOH (construction and O&M) contingent upon the NPT developing a NOAA-approved management plan for the NEOH program. *Coarse Screen action A.3.11*

Snake River Sockeye Salmon

- Fund expansion of Snake River sockeye smolt production to 500,000 to 1,000,000 smolts. *Coarse Screen action A.3.19*. BPA will work with the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) and other interested parties to develop performance standards for this proposed action. If this experimental expanded smolt program for Redfish, Pettit, and Alturas lakes fails to meet the performance standards, we will consider funding implementation of other alternative actions, including, but not limited to, actions proposed in the Remand collaboration process, such as reintroduction of Snake River sockeye into Wallowa Lake or establishment of a Snake River sockeye hatchery program below Bonneville Dam that would serve as an "egg bank."

- The COE and BPA will work with the SBSTOC and NOAA (the Lower Granite Dam adult trap operator) to explore feasibility and potentially develop a plan for truck transport of a number of returning sockeye adults from Lower Granite Dam to natural or artificial spawning locations in the Stanley Basin. Transported adults would avoid the relatively high mortality incurred by adults migrating upstream in Snake and Salmon rivers to the Stanley Basin. If needed, fund additional infrastructure for trapping, holding, and transportation.

Columbia River Chum Salmon

- Fund assessment of habitat potential, development of reintroduction strategies, and implementation of pilot supplementation programs for chum salmon in selected Lower Columbia River tributaries below Bonneville Dam.

Review of the John Day Hatchery Mitigation Program

- The current hatchery program consists of fish reared at Bonneville and Spring Creek hatcheries and released either on station or at upstream acclimation sites. The intent of the review will be to work collaboratively with the regional fish managers to identify alternative hatchery mitigation strategies, critique alternatives and implement at strategy that:

i. Meets the mitigation requirement;
ii. Provides a cost effective solution that considers both cost of implementation and long term operations; and
iii. Minimizes any adverse effects on ESA listed stocks consistent with the programmatic funding criteria described above.

B. Longer–term Priority Actions

Longer-term priority (begin planning in years 1-5; implement in years 3-10 of Remand BiOp): Work with the hatchery operators to initiate the (or continue the ongoing) HGMP and consultation process as outlined below for each hatchery program. In collaboration with co-managers and hatchery operators, Action Agencies will review results of the Columbia River HSRG and USFWS hatchery review processes when completed in 2008. The hatchery reviews by independent scientists are expected to provide unbiased and scientifically sound recommendations for reforming hatchery programs. The HSRG and USFWS review teams will not make management decisions, only recommendations for co-manager, Action Agency, and NOAA consideration. Incorporate cost-effective reform actions that co-managers, hatchery operators, and NOAA consider beneficial to listed salmon and steelhead ESUs into the BiOp Implementation Plan and include funding in the budgets for the Direct Funding Agreements for mitigation hatchery programs or the Columbia Basin Fish and Wildlife Program, as appropriate. Implement future changes identified through the hatchery RM&E program, including termination of ineffective or no longer needed conservation programs or other hatchery programs.

For any new actions proposed by the Action Agencies, the Action Agencies will work with NOAA, hatchery operators, and/or project sponsors to further define/describe the action, accurately estimate capital and expense costs, determine time schedule for implementation, and incorporate this information in the BiOp Implementation Plan. Ongoing discussions and coordination among Action Agencies, co-managers, and NOAA to further define hatchery priorities and details of specific actions will continue.

C. Implementation Funding

Implementation funding through BOR appropriations for Grand Coulee mitigation and through BPA's Direct Funding Agreement with Reclamation (Entiat NFH, Leavenworth NFH, and Winthrop NFH). Implementation funding through COE appropriations for John Day and Dworshak mitigation and through BPA's Direct Funding Agreement with COE. Implementation funding through BPA's Direct Funding Agreement with USFWS for LSRCP programs.

3. Description of Hatchery Programmatic Actions

A. Description

FCRPS hatchery mitigation program actions fall into two broad categories: 1) funding of FCRPS hatchery programs to mitigate for the loss or reduction of fish production for fisheries;

and 2) funding of ESA-related conservation hatchery programs to avoid extinction and assist in recovery.

The second category, conservation hatchery programs, can be further categorized as three types:

a. *Safety-net programs to prevent extinction of ESA-listed species.* These are programs that use artificial propagation to conserve genetic resources of a population at high risk of extinction. These types of programs have also been called "rescue" programs. An example is the Snake River sockeye salmon captive broodstock program prior to the current expansion of smolt production. Without this "emergency" captive broodstock "safety-net" program, the ESU would be extinct.

b. *Short-term supplementation programs to increase ("jump start") abundance of ESA-listed species.* These are artificial propagation programs intended to increase the abundance of ESA-listed populations at low abundance, but not identified as being at high risk of extinction and requiring "emergency" intervention with a hatchery program. Implementation of this type of program can increase and sustain population abundance until such time as habitat improvements or improvements in other major limiting factors allow natural productivity rate greater than one (1.0), the replacement level. The time to achieve recovery for a population can be reduced through this type of hatchery program. (Johnson, Johnson and Smith 2006)

c. *Recolonization of unused or restored habitat for listed species.* These types of programs involve the seeding of unpopulated habitat with ESA-listed hatchery-origin fish with the objective of establishing a self-sustaining natural population, thereby increasing abundance and improving spatial structure of the ESU.

A list of Action Agency-funded anadromous artificial production programs in these broad categories in the Interior Columbia region, plus the Bonneville hatchery and Duncan Creek Chum programs in the Lower Columbia, is provided in *Attachment 4*. This list represents the Action Agency-funded hatchery programs that are the subject of this Program-level Consultation.

B. Objectives and Funding Criteria for Hatchery Programs

The Action Agencies have identified the following ESA-related objectives for the FCRPS hatchery programs:

Review and fund the management of the FCRPS mitigation hatchery programs in a way that continues to meet mitigation obligations and helps to reverse the decline and contribute to the recovery of ESA-listed fish. In particular:

- All FCRPS mitigation hatchery programs designed to mitigate for the loss or reduction of fish production for fisheries are to use best management practices, adapted to effectively address site-specific circumstances, to enable an operation that minimizes to the greatest extent possible effects on ESA-listed natural fish with a goal of negligible or no negative effect. New artificial propagation mitigation programs must not jeopardize ESA-listed

ESUs/DPSs or impede recovery, (i.e., must be issued ESA section 4(d), 7 or 10 authorization,) and must incorporate best management practices as described above.

- We will reevaluate the funding of existing programs that may have negative effects on the viability of ESA-listed ESUs/DPSs through HGMPs for site specific hatchery consultations to determine how mitigation obligations can continue to be met in a manner that does not impede recovery;
- FCRPS mitigation hatchery programs producing ESA-listed fish and operated for a conservation purpose (these are primarily integrated supplementation programs) are to use best management practices, adapted to effectively address site-specific circumstances, so that they contribute to the increased viability of ESA-listed natural fish and recovery goals.
- We will fund safety net programs for populations at high risk of extinction and conservation programs to improve viability and contribute to recovery of ESA-listed populations and ESUs.
- We will conduct essential monitoring and evaluation to confirm that these objectives are being met.
- We will require programs that we fund to develop plans for reducing/modifying/or eliminating hatchery programs operated for a conservation purpose as numbers of natural spawners near recovery goals consistent with NOAA's recovery plans.

The Action Agencies will use these objectives in making future funding decisions related to their hatchery programs.

C. Best Management Practices

Best management practices are a general set of guidelines that will be tailored to each program as applicable when Tier 2 consultations are conducted. The Action Agencies support and endorse the general guidelines for hatchery operation published by the Hatchery Scientific Review Group (HSRG) in their 2004 Report (HSRG 2004a) and the guidelines in several other peer-reviewed publications (Flagg *et al*. 2004, and Olsen *et al.* 2004, and Mobrand *et al.* 2005). In particular, we believe the HSRG's operational guidelines for integrated and segregated hatchery programs (HSRG 2004b and 2004c) are important guidelines that should be followed as closely as possible to reduce hatchery impacts on listed salmon and steelhead populations. These guidelines are summarized in *Attachment 3*. **We agree with the HSRG that a case-by-case analysis of a hatchery programs is required when applying these operational guidelines.**

D. Procedures for Programmatic Consultation

In this first tier of the programmatic consultation on the funding of hatchery programs connected to the FCRPS, the Action Agencies seek to address the biological effects of the overall FCRPS mitigation hatchery program. We describe the existing and expected near-term future hatchery program and proposed funding criteria and operating guidelines [BMPs] that we believe will generally avoid and minimize adverse effects of the hatchery programs on listed ESUs and, in the case of conservation hatcheries, contribute to recovery. We then examine the effect on the ESUs that are the subject of this consultation. We also propose several specific hatchery actions

that we believe will aid the recovery of specific listed salmon ESUs and steelhead DPSs and analyze their anticipated effects. For near-term priority actions, we will begin planning in the first year of the Remand BiOp and start implementation as soon as possible thereafter.

For the majority of the hatchery programs, the particular effects of each individual hatchery program on each listed ESU that may be affected cannot be meaningfully discerned at this first-tier level of analysis. Therefore we are proposing that subsequent second-tier consultations be completed for each individual (or possibly groups of related) hatchery programs that will result in a program-specific biological opinion or concurrence letter. We propose that the second-tier consultations be initiated by the submittal of an updated Hatchery and Genetic Management Plan that clearly describes the existing program and lays out how the program proposes to meet the first-tier consultation funding criteria, and implement the operating guidelines (BMPs).

For each hatchery program funded by the Action Agencies, the operator will be asked for:

A Hatchery and Genetic Management Plan (HGMP) (updated if needed) to be prepared by the hatchery operator, and reviewed by the Action Agencies prior to being submitted to NOAA including:

A description of how the operation of the hatchery is meeting best management practices adapted to address site-specific circumstances; and in the case of supplementation programs aimed at conservation/recovery – a plan for how the operation will be modified when numbers of natural spawners near recovery goals

Cost estimates for any actions needed to allow the individual hatchery program to meet the funding criteria and operating guidelines in the programmatic consultation. The Action Agencies will review the proposed actions and estimates and analyze the cost effectiveness of proceeding with the actions prior to submitting the HGMPs to NOAA.

NOAA will be requested to:

Review the HGMPs and NEPA documents[4] submitted by the Action Agencies and hatchery operators and commence the appropriate ESA process.[5] Any needed direct or indirect take will be addressed in this second-tier consultation process.

[4] NEPA documentation is required for some types of ESA consultations. If major changes in the operations of the hatchery program or new construction are proposed, an appropriate NEPA document prepared by the lead action agency will accompany the HGMP. If no changes in operations are required, any existing NEPA documentation will be supplied for NMFS' information and use in the analysis. In cases where Section 10 or 4(d) consultations are equired and program-specific consultation has not yet been completed, the lead action agency will cooperate with NMFS to complete an appropriate NEPA document.

[5] Section 10 (a)(1)(A) permits for programs that directly take endangered fish, Section 4(d) coverage for programs that directly take threatened fish, and Section 7 for programs that have only indirect take.

Table 1. Upper Columbia Steelhead DPS

PAST ACTIONS (2000 - 2006) Benefits Summary							
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
		A	**P**	**SS**	**D**		
DPS-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval (i.e., ESA section 4(d), 7 or 10 compliance) and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process (BPA).	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Okanogan River	Develop a locally-adapted summer steelhead program to supplement natural production in the Okanogan River. This action is included in FY 07-09 F&W Program proposal 2007-212-00 submitted by CCT.	**New**	**X**	**X**		**X**	**H** level of benefit expected to accrue **during** and **after** BiOp period. (USFWS & NOAA)	**Coarse Screen action A.3.9**
Wenatchee Entiat Methow Okanogan	Implement a steelhead kelt reconditioning program in the upper Columbia basin utilizing techniques similar to those already established in the Yakima Basin to build upon that program's results in order to	**New**	**X**		**X**	**?**	**M-H** level of benefit for maintaining population (BPA, using the NOAA & USFWS benefits rating for MCR steelhead kelt reconditioning program in Yakima R.)	**Coarse Screen actions A.4.6, A.4.7, and A.4.8.** Need to determine Action Agencies' and Mid-Columbia PUD's funding obligations for this action; potential

	supplement the naturally-spawning steelhead populations in the Wenatchee, Entiat, Methow, and Okanogan basins.							cost-sharing with Mid-Columbia PUDs.

Benefits Summary for Other Entities' Actions								
Population	**Non-Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) Biop period**	**Comments**
		A	**P**	**SS**	**D**		
Wenatchee River	Program transitioned to local broodstock. Currently funded by PUD. Full realization of benefits not complete.	**X**	**X**		**X**	**M - H** benefit. Benefits expected to accrue **during** and **after** BiOp period, as expected productivity improvements may take several generations (USFWS & NOAA)	**Coarse Screen action A.2.4**. Past use of Wells stock identified as one of the primary contributors to low productivity. This action eliminated future threat to low productivity from Wells steelhead stock.
Entiat River	Wells stock releases discontinued. Full realization of benefits not complete.	**X**	**X**		**X**	**H** benefit expected to accrue **during** and **after** BiOp period. Previous hatchery program used non-local Wells hatchery stock which has been identified as potentially one of the primary contributors to low productivity. (USFWS & NOAA)	**Coarse Screen A.2.4**. This action addressed one of the primary factors for low steelhead productivity.

Table 2. Upper Columbia Spring Chinook ESU

PAST ACTIONS (2000 - 2006) Benefits Summary								
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) Biop period**	**Comments**
		A	**P**	**SS**	**D**		
ESU-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval (i.e., ESA section 4(d), 7 or 10 compliance) and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Actions**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Entiat	In collaboration with the U.S. Fish and Wildlife Service, the operator of the Leavenworth National Fish Hatchery complex (LNFH complex), the Action Agencies propose to accelerate various reforms in the operations of the Entiat National Fish Hatchery (which is part of the LNFH complex). Action A.1.2 from the "Coarse Screen" would benefit	**New**	**X**	**X**		**X**	Discontinuing the Entiat NFH Carson stock spring Chinook program, a serious risk factor to the natural spring Chinook population, is expected to have **H** benefits during and after the BiOp period (BPA).	**Coarse Screen action A.1.2** This action is also consistent with recommendations in the USFWS draft report on a recent comprehensive review of the Leavenworth NFH complex. Discussions with the USFWS are ongoing regarding a transition plan and the time required to phase out the existing program in view of the fact that juvenile Carson stock fish

	Upper Columbia River spring Chinook salmon in the Entiat River. This action discontinues release of the currently reared out-of-basin Carson stock spring Chinook salmon from Entiat NFH (which is considered to be a high risk factor) and reprogram the hatchery to rear and release 400,000 yearling summer Chinook salmon or coho salmon smolts. Other options may be considered to accomplish the same biological effect during the development of the implementation plan.							are currently on station and several broodyears of adults have yet to return. Any reform actions proposed for the LNFH complex must also be consistent with the complex's ongoing mitigation obligation for Grand Coulee Dam, and will require agreement among the fisheries co-managers. Final decisions will be made on this action following consideration and feedback by the *U.S. v. Oregon* parties on the options presented by the Action Agencies. The Agencies currently estimate that implementation will begin in 2008-09 if agreement is reached.
Okanogan	The Action Agencies support the effort to explore reintroduction of listed spring Chinook in the Okanogan River. A proposal for this action has been made through *Coarse Screen action B.4.6,* "Fund reintroduction of spring Chinook in the Okanogan River using Methow Composite Stock." This proposal is part of the Colville Tribes' Chief Joseph Hatchery project that is currently undergoing 3-Step Review to receive BPA funding under the Fish and Wildlife Program.	**New**	**X**	**X**	**X**		**H** benefit expected to accrue **during** and **after** BiOp period (BPA).	**Coarse Screen action B.4.6.** The Chief Joseph Hatchery project is expected to complete Step 2 of the 3-Step Review process in late summer 2007 and proceed to Step 3 where final design work will be completed. Assuming final Step 3 approval, construction of this new hatchery would start in FY 2009 and be completed in FY 2010. Outplanting of Methow Composite stock spring Chinook in the Okanogan River would begin in 2011.

Table 3. Snake River Spring/Summer Chinook ESU

PAST ACTIONS (2000 - 2006) Benefits Summary							
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
		A	**P**	**SS**	**D**		
ESU-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval (i.e., ESA section 4(d), 7 or 10 compliance) and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.
	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the Safety-Net Artificial Propagation Program (SNAPP) planning process to identify any additional spring/summer Chinook populations at high risk of extinction that would benefit from implementation of a safety-net hatchery program.					**L** benefit from this planning process. (BPA)	Populations identified by the SNAPP planning process as being at severe risk of extinction already had a safety-net program or conservation hatchery program in place to reduce that risk.
Lower Snake							
Tucannon River	BPA funded the Tucannon River Spring Chinook Captive Broodstock Program (a safety-net program) from 2000 through 2006 to reduce the extinction risk of the target population.	**X**		**X**	**X**	**H** (CTUIR)	**Coarse Screen action A.2.7**. A rescue program to preserve and build genetic resources - NOAA draft *Hatchery Effects Report*.
Salmon River							
East Fork West Fork	BPA funded the Salmon River Captive Rearing Program (a safety-net program) from	**X**		**X**	**X**	**H** relative to preserving current genetic resources,	**Coarse Screen action A.2.6** A research project to evaluate

Yankee Fork Lemhi River	2000 through 2006 to reduce the extinction risk of the target populations.					but program experimental to test method efficacy. (IDFG). IDFG dropped the Lemhi River population from the study design in 2004.	captive rearing techniques and prevent extinction of the target populations.
Grande Ronde/Imnaha River							
Upper Grande Ronde Catherine Creek Lostine River	BPA funded the Grande Ronde Captive Broodstock Program (a safety-net program) from 2000 through 2006 to reduce extinction risk of the target populations.	**X**		**X**	**X**	**H** benefit during BiOp period (CTUIR)	**Coarse Screen action A.2.8.** A rescue program to preserve and build genetic resources - NOAA draft *Hatchery Effects Report*.
	BPA funded the Grande Ronde Recovery Program (conventional supplementation program) from 2000 through 2006 to reduced extinction risk and contribute to recovery of the target populations.	**X**		**X**	**X**	**H** benefit for reducing extinction risk and contributing to the recovery of the Upper Grande Ronde River, Catherine Creek, and Lostine River spring/summer Chinook populations**.** (BPA)	A recovery program using conventional hatchery supplementation and following practices that promote viability in the wild - NOAA draft *Hatchery Effects Report*.
Lostine River Imnaha River	BPA funded the development of the Master Plan and other planning and design costs for the Northeast Oregon Hatchery					**L** benefit for this planning process (BPA)	
Johnson Creek	BPA funded the Johnson Creek Artificial Propagation and Enhancement (JCAPE) program (a safety-net program) to reduce extinction risk of the target population.	**X**		**X**	**X**	**H** - Increases abundance of integrated population and fish spawning naturally, lowers risk of extinction (NPT)	**Coarse Screen action A.2.5**

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Lower Snake								
Tucannon River	Fund Tucannon River Spring Chinook Captive Broodstock Program (a safety-net program) as long as NOAA Fisheries considers it beneficial and necessary to reduce the extinction risk of the target population.	**Continued**	**X**		**X**	**X**	**H** (CTUIR)	**Coarse Screen action A.2.7**. A rescue program to preserve and build genetic resources - NOAA draft *Hatchery Effects Report*.
Salmon River								
East Fork West Fork Yankee Fork	Fund the Salmon River Captive Rearing Program (a safety-net program) as long as NOAA Fisheries considers beneficial and necessary to reduce extinction risk of the target populations.	**Continued**	**X**		**X**	**X**	**H** relative to preserving current genetic resources, but program experimental to test method efficacy. (IDFG). IDFG dropped the Lemhi River population from the study design in 2004.	**Coarse Screen action A.2.6**. A research project to evaluate captive rearing techniques and prevent extinction of the target populations. "Evaluation of adult returns from this research project will be "new" in the sense that the adult fish were not counted as part of the baseline analysis, but because this was primarily a research project to test safety-net methodology, substantial adult return is not anticipated" - IDFG memo to Hatchery/Harvest WG, 10/27/06.
Grande Ronde/Imnaha River								
Upper Grande Ronde Catherine Creek	Fund the Grande Ronde Captive Broodstock Program (a safety-net program) to reduce extinction risk of the target	**Continued**	**X**		**X**	**X**	**H** benefit during BiOp period (CTUIR)	**Coarse Screen A.2.8**. A rescue program to preserve and build genetic resources - NOAA draft *Hatchery Effects Report*.

Lostine River	populations.							
	Fund the Grande Ronde Recovery Program (conventional supplementation program) to reduce extinction risk and contribute to recovery of the target populations.	**Continued**	**X**		**X**	**X**	**H** benefit for reducing extinction risk and contributing to the recovery of the Upper Grande Ronde River, Catherine Creek, and Lostine River spring/summer Chinook populations**.** (BPA)	A recovery program using conventional hatchery supplementation and following practices that promote viability in the wild - NOAA draft *Hatchery Effects Report*.
Lostine River Imnaha River	Fund construction of the Northeast Oregon Hatchery (NEOH) and future O&M of NEOH contingent upon the NPT developing a NOAA-approved management plan for the NEOH program.	**New**	**X**				NOAA, NPT, and BPA are working to determine recovery benefits.	**Coarse Screen action A.3.11**
South Fork Salmon River								
Johnson Creek	Fund the Johnson Creek Artificial Propagation and Enhancement (JCAPE) program (a safety-net program) to reduce extinction risk of the target population.	**Continued**	**X**		**X**	**X**	**H** - Increases abundance of integrated population and fish spawning naturally, lowers risk of extinction (NPT)	**Coarse Screen action A.2.5**

Table 4. Snake River Steelhead DPS

PAST ACTIONS (2000 - 2006) Benefits Summary								
Population	**Action Agency Hatchery Actions**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
		A	**P**	**SS**	**D**		
DPS-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval (i.e., ESA section 4(d), 7 or 10 compliance) and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.
	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the Safety-Net Artificial Propagation Program (SNAPP) planning process to identify any additional steelhead populations at high risk of extinction that would benefit from implementation of a safety-net hatchery program.					**L** benefit from this planning process. (BPA)	Populations identified by the SNAPP planning process as being at severe risk of extinction already had a safety-net program or conservation hatchery program in place to reduce that risk.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Actions**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
East Fork Salmon River	Continue the **ongoing, small-scale** program trapping locally returning steelhead in the EFSR for a local broodstock supplementation program (no more than 50,000 smolts). This is an Action Agency-funded program through LSRCP.	**Continued**	**X**	**X**		**X**	**M** benefits **during** and **after** BiOp period. (IDFG)	**Coarse Screen A.2.11**. Adult returns from juvenile releases have only recently begun, so these fish probably would not have been part of baseline analysis - IDFG memo to

								Hatchery/Harvest WG, 10/27/06.
DPS-wide	As an action intended to benefit primarily Snake River B-run steelhead, but with potential benefits for all listed salmon and steelhead, BPA will work with NOAA Fisheries to identify a "trigger" for future safety-net planning or to identify and populations that may require immediate safety-net planning. In the event a safety-net plan is needed for a population, BPA will seek proposals to meet the need.	**New**					A completed safety-net plan for high-risk steelhead populations would ensure that an artificial propagation safety-net project, if determined by NOAA to be necessary to prevent extinction, could be implemented as quickly as possible.	

Table 5. Snake River Fall Chinook ESU

PAST ACTIONS (2000 - 2006) Benefits Summary							
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
		A	**P**	**SS**	**D**		
Snake River	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval (i.e., ESA section 4(d), 7 or 10 compliance) and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.
	BPA funded the ESA-listed fall Chinook production program at Nez Perce Tribal Hatchery.	**X**	**X**		**X**	**H** - Increases fish spawning naturally and improves spatial structure and diversity. Important to sustaining population and preventing extirpation. (NPT)	**Coarse Screen action A.2.10**. Adult returns from NPTH releases began in 2005.
	Action Agencies funded Lower Granite Dam adult salmon and steelhead trap improvements.				**X**	Benefits will begin accruing in 2007	**Coarse Screen action A.3.16**
	Action Agencies funded operation and maintenance of the Lower Granite Dam adult trap.				**X**	Benefits will begin accruing in 2007	**Coarse Screen action A.3.16**

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Snake River	Fund the ESA-listed fall Chinook production program at Nez Perce Tribal Hatchery .	**Continued**	**X**	**X**		**X**	**H** - Increases fish spawning naturally and improves spatial structure and diversity. Important to sustaining population and preventing extirpation. (NPT)	**Coarse Screen action A.2.10**. Adult returns from NPTH releases began in 2005.
	Fund the expansion of the Lower Granite Dam adult salmon and steelhead trapping facility.	**Continued**	**X**	**X**		**X**	**M-L** benefits. (NPT) The expanded capacity of the trapping facility will enable: (1) collection of more natural-origin broodstock for Lyons Ferry and NPTH, with benefits for broodstock management and population diversity; (2) trapping and removal of more out-of-basin stray fall Chinook, with benefits to diversity; and (3) improved data collection for run reconstruction and research. (BPA)	**Coarse Screen action A.3.16**. The trap improvements are expected to be completed by February 2007, so the benefits of the expanded trapping facility for fall Chinook will begin to accrue in 2007.
	Fund the operation and maintenance of the Lower Granite Dam adult salmon and steelhead trapping facility.	**Continued**	**X**	**X**		**X**		**Coarse Screen action A.3.16.**

Table 6. Snake River Sockeye ESU

PAST ACTIONS (2000 - 2006) Benefits Summary							
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
		A	**P**	**SS**	**D**		
Snake River	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.
	BPA has funded the Snake River Sockeye Safety-Net Program since its inception in 1991.	**X**		**X**	**X**	**H** contribution to maintaining population**.** (IDFG) **H** benefit for preventing extinction and preserving genetic resources of this population. (BPA) The program is reintroducing Redfish Lake sockeye into Alturas and Pettit lakes .	No Coarse Screen action for the ongoing program. The benefits to the expanded smolt program will begin to accrue in 2007, so these benefits are assessed in the Proposed Action table for Snake River Sockeye.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Snake River	Continue the Snake River Sockeye Safety Net Program,	**Continued**	**X**		**X**	**X**	**H** contribution to maintaining the population (IDFG) **H** benefit for	No Coarse Screen action for the ongoing

	including nursery lake habitat enhancement and limnological monitoring, as long as NOAA Fisheries considers it beneficial to recovery and necessary to reduce the extinction risk of the target population. Complete the expansion of the smolt program to a capacity of 150,000 smolts per year through construction of improvements at Oxbow Hatchery (ODFW) and Eagle Hatchery (IDFG).						preventing extinction and preserving genetic resources of this population **during** and **after** the period of the BiOp. (BPA) The program is reintroducing Redfish Lake sockeye into Alturas and Pettit lakes. The expansion of the smolt program to a production level of 150,000 smolts, and the subsequent increased adult returns, has the potential to "jump start" natural spawning in the Sawtooth Valley nursery lakes.	program. Program expansion to 150,000 smolts is **Coarse Screen action B.3.15**.
Snake River	Fund implementation of expanded smolt production to a level of 500,000 to 1,000,000 sockeye smolts with the associated broodstock and release infrastructure of the Stanley Basin sockeye program. BPA will work with the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) and other interested parties to develop performance standards of this proposed action.	**New**	**X**		**X**	**X**	Further expansion of the smolt program to a production level of 500,000 - 1,000,000 smolts, and the subsequent increased adult returns, has the potential to provide a substantial "jump start" to natural spawning in the Sawtooth Valley nursery lakes, with **H** level of benefit **during** and **after** the BiOp period (BPA).	**Coarse Screen action A.3.19.** .
Snake River	BPA will work with the SBSTOC, NOAA Fisheries, and COE to explore feasibility and to potentially develop a plan for transporting a number of returning sockeye adults from Lower Granite Dam to the Stanley Basin. If needed, fund additional infrastructure for trapping, holding, and/or transportation.	**New**	**X**				**M-H** benefits depending on number of adults successfully transported. Transported adults would avoid the high in-river mortality that has been observed in the migration corridor between Lower Granite Dam and Redfish Lake (BPA).	Not in Coarse Screen

Table 7. Mid-Columbia Steelhead DPS

PAST ACTIONS (2000 - 2006) Benefits Summary								
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
		A	**P**	**SS**	**D**		
DPS-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Section 7 consultation to identify operational changes that will benefit listed populations.
Upper Yakima River Naches River Toppenish River Satus Creek	BPA funded the Yakima River steelhead kelt reconditioning program.	**X**		**X**	**?**	**M-H** level for maintaining population (USFWS & NOAA). M level of benefit expected to accrue during BiOp period. (USFWS & NOAA) Program started in 2000. Short- and long-term reconditioned steelhead kelts represented 2-11% of the annual spawning escapement in the Yakima River from 2001 to 2005.	**Coarse Screen action A.2.3.** YN reports that radio telemetry results have shown that reconditioned kelts successfully located spawning grounds and constructed redds. YN is conducting reproductive success study of artificially reconditioned steelhead kelts which should provide important information on use of kelt reconditioning tool.
Umatilla River	BPA funded the MCR steelhead conservation program at the Umatilla Hatchery.	**X**			**X**	**H** level of benefit 2000 - 2006 (BPA)	There is no action in the Coarse Screen for this ongoing program. Recovery program for preserving genetic resources and temporarily boosting the number of natural spawners. Natural origin fish abundance averaged more than 2,000 from 1999 to 2004. Tech Recovery Team abundance threshold is 2,250.

							–NOAA draft *Hatchery Effects Report*.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Upper Yakima River Naches River Toppenish River Satus Creek	Fund the Yakima River steelhead kelt reconditioning program as long as NOAA Fisheries considers it beneficial to recovery and necessary to reduce extinction risk of the target populations.	**Continued**	**X**		**X**	**?**	**M-H** level for maintaining population (USFWS & NOAA). M level of benefit expected to accrue during BiOp period. (USFWS & NOAA) Program started in 2000. Short- and long-term reconditioned steelhead kelts represented 2-11% of the annual spawning escapement in the Yakima River from 2001 to 2005.	**Coarse Screen A.2.3.** YN reports that radio telemetry results have shown that reconditioned kelts successfully located spawning grounds and constructed redds. YN is conducting reproductive success study of artificially reconditioned steelhead kelts which should provide important information on use of kelt reconditioning tool.
Umatilla River	Fund the MCR steelhead conservation program at the Umatilla Hatchery as long as NOAA Fisheries considers it beneficial to recovery of the target population.	**Continued**	**X**			**X**	**H** benefit **during** and **after** the BiOp period. (BPA)	There is no action in the Coarse Screen for this ongoing program. Recovery program for preserving genetic resources and temporarily boosting the number of natural spawners. Natural origin fish abundance averaged more than 2,000 from 1999 to 2004. Tech Recovery Team abundance threshold is 2,250. - NOAA draft *Hatchery Effects Report*.

Benefits Summary for Other Entities' Actions				
Population	**Non-Action Agency Hatchery Action**	**VSP Parameters Positively**	**Benefit accrued to natural population**	**Comments**

		Affected				during (D) or after (A) BiOp period	
		A	P	SS	D		
Multiple	Continue and refine alternative broodstock development for Wallowa stock steelhead hatchery program with emphasis on actions to reduce stray rates. Submitted by ODFW.	**?**	**X**		**X**	**L-M** level of benefit expected to accrue during and after the BiOp period. (USFS & NOAA)	**Coarse Screen action A.2.2.** Straying from out of basin hatchery steelhead identified as a threat. This action will help address this threat.
Deschutes Warm Springs Hood River	Deschutes/Warm Springs and Hood River populations: Continue removal of out-or-basin hatchery steelhead at existing sorting facilities, including Warm Springs weir, Powerdale Dam trap, and Round Butte trap. Out-of-basin hatchery steelhead are identifiable in the Deschutes and Hood River because local broodstocks in these basins already have unique marks.	**?**	**X**		**X**	**L - M l**evel of benefit expected to accrue **during** and **after** BiOp period (USFWS & NOAA)	**Coarse Screen A.2.1.** Straying from out of basin hatchery steelhead identified as a threat. This action will help address this threat.

Table 8. Lower-Columbia Steelhead DPS

PAST ACTIONS Benefits Summary							
Population	**Action Agency Hatchery Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
		A	**P**	**SS**	**D**		
DPS-wide	As required by the RPA in the 2000 FCRPS BiOp, BPA funded the development of Hatchery and Genetic Management Plans (HGMPs) for all federally-funded hatchery programs in the ESU. The objective was to develop the HGMPs for NOAA Fisheries approval and identification of and prioritization of hatchery reform measures by NOAA.					**L** benefit from this planning process. (BPA)	We expect NOAA Fisheries to use the HGMPs in their hatchery program ESA Sect. 7 consultation to identify operational changes that will benefit listed populations.
Hood River	BPA funded the Hood River steelhead safety-net program for winter and summer steelhead.	**X**			**X**	**H** level of benefit 2000 -2006 for reducing extinction risk and increasing abundance. (BPA)	No action in the Coarse Screen for this ongoing program. Program has had a positive effect by increasing the number of natural spawners and preserving genetic resources - NOAA draft *Hatchery Effects Report*

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during 2000 - 2006 period**	**Comments**
			A	**P**	**SS**	**D**		
Hood River	Fund the Hood River steelhead safety-net program for winter and summer steelhead as long as NOAA Fisheries considers it beneficial to recovery and necessary to reduce extinction risk of the target populations.	**Continued**	**X**			**X**	**H** level of benefit **during** and **after** the BiOp period for increasing abundance and reducing extinction risk. (BPA)	No action in the Coarse Screen for this ongoing program. Program has had a positive effect by increasing the number of natural spawners and preserving genetic resources - NOAA draft *Hatchery Effects Report*

Table 9. Columbia River Chum ESU

PAST ACTIONS (2000 - 2006) Benefits Summary								
Population	**Action Agency Hatchery Action**		**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Lower Columbia Gorge Tributaries	BPA funded the program to re-introduce Columbia River chum salmon in Duncan Creek		**X**		**X**	**X**	**H** benefit for preventing extinction and preserving genetic resources of the population. (BPA)	No action in the Coarse Screen for this ongoing program.

FUTURE ACTIONS Benefits Summary								
Population	**Action Agency Proposed Hatchery Action**	**Continuation of Ongoing Action or New Action**	**VSP Parameters Positively Affected**				**Benefit accrued to natural population during (D) or after (A) BiOp period**	**Comments**
			A	**P**	**SS**	**D**		
Lower Columbia Gorge Tributaries	Fund the program to re-introduce Columbia River chum salmon in Duncan Creek as long as NOAA Fisheries considers it beneficial to recovery and necessary to reduce extinction risk of the target population.	**Continued**	**X**		**X**	**X**	**H** benefit for preventing extinction and preserving genetic resources of the population **during** and **after** the period of the BiOp. (BPA)	No action in the Coarse Screen for this ongoing program.
ESU-wide	Fund assessment of habitat potential, development of reintroduction strategies, and implementation of pilot supplementation projects in selected Lower Columbia River Tributaries below Bonneville Dam.	**New**	**X**		**X**	**X**	**H** benefit for preventing extinction and preserving genetic resources of the populations **during** and **after** the period of the BiOp. (BPA)	No action in the Coarse Screen for this new proposal.

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Attachment 1

Action Agencies' Hatchery Mitigation Authorities/Obligations for the FCRPS

There are numerous legislative sources of authorities that delineate the Action Agencies' mitigation obligations and responsibilities. For artificial production or hatchery facilities the primary statutes are the Mitchell Act, the Lower Snake River Compensation Plan, individual hydro-project authorizations, and the Northwest Power Act.

1. Bureau of Reclamation

Leavenworth National Fish Hatchery complex is mitigation for the construction of Grand Coulee Dam and is authorized by the Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Project Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946.

2. Corps of Engineers

The original authorizations for the hatcheries operated by the Corps as mitigation for the FCRPS occurred primarily through various Flood Control Acts. Generally, Chief of Engineers reports were submitted to Congress at the time of project authorization and included assessments of impacts to fisheries and associated objectives for hatcheries to address those impacts. Typically, the project authorizations included a requirement to construct the project "substantially in conformance" with the Chief of Engineers report. The Corps has three artificial production facilities to mitigate for the impacts of the 12 Corps projects associated with the Federal Columbia River Power System biological opinion. The Corps built these hatcheries with appropriated dollars, and funds the U.S. Fish and Wildlife Service and Oregon Department of Fish and Wildlife to operate the facilities.[1] BPA repays the Treasury for the share of those capital construction costs, and funds the Corps under a direct funding agreement for the annual operation and maintenance expenses in the amounts allocated to the dam's power purpose.

As the Corps completed construction of the last of four dams on the lower Snake River in Washington, it submitted a Chief of Engineers report with findings from a Fish and Wildlife Coordination Act report. In the Water Resource and Development Act of 1976, Congress authorized the Lower Snake River Compensation Plan (LSRCP) by stating simply that, "The Secretary of the Army is hereby authorized to undertake the phase I design memorandum stage of advanced engineering of the following water resource development projects, substantially in

[1] Dworshak National Fish Hatchery, Spring Creek National Fish Hatchery, and Bonneville Hatchery

accordance with, and subject to the conditions recommended by the Chief of Engineers, in the reports hereinafter designated." After construction of the LSRCP hatchery projects, their ownership was turned over to the U.S. Fish and Wildlife Service. Fish and Wildlife receives approximately $19.5 million annually for operation and maintenance activities as part of a direct funding agreement with BPA. The responsibility for capital improvements has not yet been agreed upon.

3. Lower Snake River Compensation Plan

The LSRCP includes specific fish production goals. Unlike most hatchery goals, the LSRCP goals are not stated in terms of fish produced for release, but in terms of the number of returning adults needed to mitigate for the fishery losses. The program has not met its goals, and beginning in the 1990s began changing facility operations, configuration, aquacultural practices, and stock production numbers and composition to address ESA needs. BPA funded these changes through its direct funding agreement with the U.S. Fish and Wildlife Service. Neither the Service nor BPA sought, nor did Congress grant, any additional legislative authorizations to make these program changes from the original LSRCP plan.

4. Bonneville Power Administration

BPA has a number of interrelated authorities it uses to fund hatchery construction, operations, and maintenance. The primary statutes are the Northwest Power Act, including its direct funding provision, the Bonneville Project Act, and the Transmission System Act.

The Northwest Power Act created the Northwest Power and Conservation Council (Council) with, among other responsibilities, to develop a Columbia River Basin Fish and Wildlife Program (Fish and Wildlife Program). Under the NW Power Act, BPA has specific duties:(1) to protect, mitigate, and enhance fish and wildlife adversely affected by the construction and operation of the FCRPS;(2) to do so in a manner that provides equitable treatment for such fish and wildlife with the other purposes of the FCRPS, and in a manner consistent with the Council's Fish and Wildlife Program; and (3) to assure the Pacific Northwest of an adequate, efficient, economical, and reliable power supply. The Council recommends measures to implement the Fish and Wildlife Program (which may include specific recommendations for funding hatchery operations or improvements) and BPA makes funding decisions consistent with the Program and its other statutory requirements. The Administrator must use the Bonneville Fund and the "other authorities of the Administrator" to implement projects that help fulfill his mitigation responsibilities under the Northwest Power Act, including hatchery construction, operations, and maintenance. Those "other authorities" include the following:

- The Bonneville Project Act, section 2f authority that allows the Administrator to enter into contracts as he deems necessary to accomplish BPA's statutory missions.
- The Transmission System Act, section 11a that created the Bonneville Fund, and section 11b, that authorized the use of the fund to fulfill the purposes of the Northwest Power Act.

BPA has used these authorities to construct a number of hatcheries since the Northwest Power Act became law in 1980, and pays for the ongoing operation and maintenance for these hatcheries.

In addition, when funding the Corps, Reclamation, or the U.S. Fish and Wildlife Service for hatchery program operations and maintenance, the Administrator uses his express direct funding authority. Section 839d-1 of the Northwest Power Act authorizes the Administrator to make funds available for the generation additions, improvements, and replacements of facilities and equipment at Federal hydroelectric projects in the Pacific Northwest. Section 839d-1 specifically states that the Administrator may provide "any funds that the Administrator determines to make available to the respective Secretary [of the Army or the Interior] for such purposes." These purposes have been interpreted to include associated fish and wildlife mitigation and enhancement measures. A second source of direct funding authority is found in section 11(b) of the Transmission System Act (TSA).[2] Under the Northwest Power Act, BPA ratepayers must not pay for more than the "power share" of FCRPS mitigation.[3] Thus, through its direct sharing agreements with the Corps and the Bureau, BPA pays the "power share" of the hatcheries owned by the Corps and the Bureau.

[2] Section 11(b) authorizes the Administrator to make expenditures from the Bonneville Fund "without further appropriation and without fiscal year limitation . . . for any purpose necessary or appropriate to carry out the duties imposed upon the Administrator. . . ." The TSA sections 11(b)(9) and (10) indicate the Administrator may make expenditures from the Fund for payments to the credit of the reclamation fund or to the Treasury for repayment of the FCRPS. The TSA section 11(b) (12) allows the Administrator to make payments required to carry out the purposes of the Northwest Power Act, including fish mitigation.

[3] *See* 16 U.S.C. §§ 839b (h) (8) (D); (10) (C).

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Attachment 2

Current Basin-Wide Hatchery Reform Efforts

1. Hatchery and Genetic Management Plans (HGMPs)

Measure 169 of the Reasonable and Prudent Action of the 2000 FCRPS Biological Opinion (2000 BiOp) called for the Action Agencies to "…fund the development of NMFS-approved HGMPs for implementation, including plans for monitoring and revising them as necessary as new information becomes available." The HGMP, developed by NOAA Fisheries to facilitate the application of hatchery reforms to specific artificial production programs, provides a standardized approach and a consistent body of relevant information about hatchery programs. According to the 2000 BiOp, the HGMP would comprehensively address facility and operational details relevant to reform measures and the menu of potential hatchery reform actions identified in Section 9.6.4.2 of the 2000 BiOp. BPA began funding the development of over 200 HGMPs in 2002, continued funding this action under the 2004 Updated Proposed Action, and recently completed the project in 2006. The HGMPs have been submitted to NOAA Fisheries for approval.

2. US Fish and Wildlife Service Hatchery Review

In an effort to improve its hatchery programs, the U.S. Fish and Wildlife Service (USFWS) initiated, in May 2005, a three-year review of the 21 Columbia River Basin salmon and steelhead hatcheries that USFWS owns or operates. The goal is to ensure that the USFWS hatcheries are operated on the best scientific principles and contribute to sustainable fisheries and the recovery of naturally-spawning populations of salmon, steelhead, and other aquatic species of concern. This internal review, in many ways, resembles the recent and successful Puget Sound and Coastal Washington Hatchery Reform Project. The USFWS believes that much of the background information necessary for reviewing hatcheries in the Columbia Basin has already been compiled in the HGMPs that were developed with BPA funding. The USFWS review project will be completed by September 2008.

3. Columbia River Hatchery Scientific Review Group (HSRG)

The purpose of this Congressionally-mandated project is to replicate the recent Puget Sound and Coastal Washington Hatchery Reform Project in the Columbia Basin. The Columbia River HSRG will review all hatcheries within the U. S. portion of the Columbia River Basin. These programs are managed by federal, state, and tribal agencies, as well as private entities. Hatchery

reform fundamentally requires evaluating hatcheries based on how they affect the fish populations in the watershed in which they are located. This methodical application of science is the foundation upon which the HSRG will conduct its hatchery reviews and make recommendations on reform actions. The HSRG calls for management based on clear goals, scientifically defensible programs, and informed decision-making. The HSRG's scientific framework and principles are embodied in the HSRG's 2004 report[1] and in Mobrand *et al*. (2005)[2]. The HSRG is currently scheduled to complete its review in spring 2008.

4. Adaptive Management

Although the Columbia River HSRG and USFWS hatchery reviews are not focused entirely on ESA-related hatchery reform, they are expected to recommend many scientifically-sound operational changes and facility modifications to reduce hatchery impacts on listed populations of salmon and steelhead. Unfortunately, these review efforts won't be completed until well after the Remand BiOp has been completed under the current schedule. However, the Agencies will consider the recommendations of these reviews and are interested in funding urgently needed reform actions for Action Agency hatchery programs during the period of the BiOp, provided they are cost-effective and are determined by NOAA Fisheries to improve viability and advance recovery of listed ESUs. In addition, the Agencies will review the results from the regional hatchery RM&E programs, as well as other relevant research results in the peer-reviewed scientific literature, and use these findings to adaptively manage the artificial production programs that they fund.

[1] Hatchery Scientific Review Group (HSRG). 2004. *Hatchery Reform: Principles and Recommendations of the HSRG*. Long Live the Kings, 1305 Fourth Avenue, Suite 810, Seattle, WA 98101. Available from http://www.lltk.org/HRP.html

[2] Mobrand, L. E., and nine coauthors. 2005. *Hatchery Reform in Washington State: Principles and Emerging Issues*. Fisheries: vol. 30, no. 6, pp. 11-23.

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Attachment 3

HSRG Guidelines for Hatchery Operation

The Action Agencies support and endorse the general guidelines for hatchery operation published by the Hatchery Scientific Review Group (HSRG) in their 2004 Report (HSRG 2004a) and the guidelines in several other peer-reviewed publications (Mobrand et al. 2005, Flagg et al. 2004, and Olsen et al. 2004). In particular, we believe the HSRG's operational guidelines for integrated and segregated hatchery programs (HSRG 2004b and 2004c) are important guidelines that should be followed as closely as possible to reduce hatchery impacts on listed salmon and steelhead populations. **We agree with the HSRG that a case-by-case analysis of a hatchery programs is required when applying these broodstock management guidelines**. The HSRG's guidance is summarized here:

Genetic and ecological interactions have been at the center of the debate over benefits and risks of hatchery programs (e.g., NRC 1993; HSRG 2004; Williams et al. 2003). The two options for managing these risks are either to minimize interaction through segregation (isolation) of the hatchery population from the natural population or to manage the hatchery population as an integral, benign component of a composite hatchery-natural population. All salmon and steelhead hatchery programs must be classified either as integrated or segregated by intent. These classifications lead directly to a series of genetic and ecological management guidelines for each of the two types of programs. How well programs meet this intent will vary; this variation provides an important measure for evaluating the biological risks posed by hatchery programs on natural populations.

Integrated Programs

The terms integrated and segregated describe the intended reproductive relationship of hatchery populations to naturally spawning populations. An integrated hatchery program is associated with a specified natural population from which gene flow occurs. The goal of an integrated program is to demographically increase the abundance of fish representing a natural population (two environments, one gene pool).

*Formal Definition: A hatchery program is an **Integrated Type** if the intent is for the natural environment to drive the adaptation and fitness of a composite population of fish that spawns both in a hatchery and in the wild.*

For a natural/hatchery composite population at equilibrium (Ford 2002), the influence of the hatchery and natural environments on the adaptation of the composite population is determined by the proportion of natural-origin broodstock in the hatchery (pNOB[1]) and the proportion of hatchery-origin fish in the natural spawning escapement (pHOS). The larger the ratio pNOB/(pHOS+pNOB), also called Proportion of Natural Influence (PNI), the greater the strength of selection in the natural environment relative to that of the hatchery environment. In order for the natural environment to dominate selection, this ratio must exceed 0.5 (Campton, Busack and Currens, personal communication). Furthermore, the greater the difference between the hatchery and natural stock components (e.g., in run timing) and the "less natural" the hatchery environment (e.g., longer hatchery rearing), the larger the ratio must be to reduce the effects of hatchery selection.

Operational Guidelines for Integrated Programs

1. The targeted value of pNOB/(pHOS+pNOB) should be based upon the current status of the stock, the goals for the stock, and involves a benefit versus risk judgment. For any fixed pNOB, the smaller the pHOS, the stronger the selective forces for the natural environment.

2. The proportion of natural-origin fish in the broodstock must exceed the proportion of hatchery-origin fish on the spawning grounds (pNOB>pHOS) for the natural environment to drive adaptation, which is equivalent to pNOB/(pHOS+pNOB), or Proportion of Natural Influence (PNI)>0.50.

3. pNOB/(pHOS+pNOB), or PNI, for integrated programs with stocks of moderate or high biological significance and viability (or goals to maintain or improve the biological significance and viability of the stock) should be greater than 0.7 to ensure high levels of natural dominance.

4. pNOB should be a minimum of 10% to avoid divergence of the hatchery population from the natural component, even when pHOS is zero.

5. A general rule of thumb is that the total number of adults (hatchery- and natural-origin) used for broodstock cannot exceed the total number of natural-origin escapement.

6. Hatchery fish should be reared under conditions that deviate as little as possible from those experienced by the natural population component, to minimize the effects of selective forces in the hatchery:

> a) Rear in a hatchery environment that allows synchronization of adult maturation, incubation and emergence, and out-migration with natural populations.

[1] Terminology: NOR = Natural Origin Return, HOR = Hatchery Origin Return, NOB = Natural Origin fish included in hatchery Broodstock, and HOS = Hatchery Origin fish in the natural Spawning escapement.

b) Use rearing protocols that produce juvenile fish similar to natural populations in growth rate and size, to reduce competition with and predation on natural stocks, and to maintain the age structure of the natural population.

c) Rear fish at reduced densities in enriched environments, to produce a fish with cryptic coloration, territorial fidelity and behavior similar to naturally-produced fish.

d) Release fish volitionally during the out-migration timing of the natural stock.

7. The size of the program should take into account the quantity and quality of habitat available for juveniles and adult spawners, and the effect of the hatchery program on natural stocks.

8. Use marks, tags or other methods to distinguish natural- and hatchery-origin fish among natural spawners, in hatchery broodstocks and in harvests.

9. Take into consideration the potential selective impacts of harvest (for example, size selectivity) on the long-term viability of integrated programs.

Segregated Programs

*Formal Definition: A hatchery program is a **Segregated Type** if the intent is for the hatchery population to represent a distinct population that is reproductively isolated from naturally-spawning populations.*

Hatchery programs are classified as segregated if the hatchery population is propagated as a genetically discrete or segregated population relative to naturally spawning populations. The principal intent of a segregated program is to create a new, hatchery-adapted population to meet goals for harvest or other purposes (research, education, etc.). Hatchery broodstocks (and programs) are considered genetically segregated if the broodstock is maintained primarily or exclusively from adults returning back to the hatchery. As a consequence, little or no gene flow from a natural population to the hatchery broodstock is intended to occur in a segregated program.

Natural spawning of fish from segregated programs may pose genetic and ecological risks to natural-spawning populations. The risks that segregated hatchery programs pose to natural populations depend on the status and goals for the natural populations, the extent to which hatchery-origin fish interact genetically and ecologically with natural-origin fish, and on the amount of genetic and phenotypic divergence between the hatchery and natural populations.

Operational Guidelines for Segregated Programs

1. Each hatchery program should include a detailed genetic management plan for broodstock that outlines protocols, etc.

2. Rear fish in a manner and/or at a location that minimizes potential straying and opportunities for natural spawning.

3. Release fish in areas where opportunities to capture non-harvested adults are maximized, thus minimizing genetic risks to natural populations.

4. Ensure adult production from segregated programs is commensurate with harvest opportunities.

5. Take into consideration the potential selective impacts of harvest (for example, size selectivity) on the long-term viability of segregated programs.

6. Ensure hatchery-origin adults constitute no more than five percent of the naturally-spawning population.

7. Use marks, tags or other methods to distinguish natural- and hatchery-origin fish among natural spawners, in hatchery broodstocks and in harvests.

8. Avoid unintentional inclusion of natural-origin adults in segregated broodstocks.

9. Minimize the effects of predation and competition on naturally-spawning stocks when designing hatchery programs.

We expect the Columbia Basin HSRG to apply these guidelines during their review of Columbia Basin hatchery programs and to make recommendations to hatchery operators, co-managers, and funding agencies for improving broodstock management and operation of integrated or segregated programs, as appropriate.

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*Attachment 4. Action Agency-funded Interior Columbia Basin Anadromous Hatchery Programs **

This is not a final federal agency product. Rather, it is a pre-decisional document prepared by the Action Agencies that reflects present understandings of currently available information and analyses, and of the progression of discussions with the sovereigns in the collaborative process. Revisions and refinements are to be expected based on further discussions with the sovereigns over new and modified proposed federal actions upon which the action agencies will ultimately consult. Finally, the information in this product does not constitute an analysis of whether the identified measures would or would not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Furthermore, this document does not in any way interpret or apply the regulatory definitions of the statutory phrases "jeopardize the continued existence of" and "destruction or adverse modification."

Relevant ESU.	**Hatchery Program** (NOAA Fisheries designation)	**Included in ESU or DPS?****	**Primary Hatchery Facility for Program**	**Purpose** (as identified by Action Agencies)	**Authorization**	**Funding**	**Operator**	**Integrated or Segregated (Isolated) Program**, as identified by hatchery operator in HGMP	**Purpose**, as identified by hatchery operator in HGMP	**Beneficial Effect on Viability** (from NOAA draft Hatchery Effects Report)	**Risk or Threat to Viability** (from NOAA draft Hatchery Effects Report)	**Comments**
CR Chum	Chum (Duncan Creek Chum)	Yes	Washougal	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	PSMFC/ WDFW	Integrated	Conservation/recovery	"+" for reintroducing chum salmon into Duncan Creek and for preserving genetic resources		2004 UPA Safety-Net Program
LCR Chinook	Fall Chinook (Bonneville Hatchery Fall Chinook- URB)	No	Bonneville	Mitigation	John Day Dam Mitigation	COE/BPA	ODFW	Segregated	Harvest Research/education		Naturally spawning fish from Bonneville Hatchery (imports from outside the area) pose a risk to population diversity and productivity in Columbia Gorge.	
LCR Chinook	Fall Chinook (Spring Creek NFH Tule Fall Chinook)	Yes	Spring Creek NFH	Mitigation Temporary Substitute	John Day Dam Mitigation	COE/BPA	USFWS	Segregated	Harvest	"+" because these fish are the most representative of the historical Columbia Gorge tule population. Preserving genetic resources until inundated habitats are restored.		
LCR Chinook	Spring Chinook (Hood R. Spring Chinook)	No	Hood River Production Program	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" for jump-starting re-colonization of spring Chinook in the Hood River.	"-" because broodstock from a different ESU (the nearby Deschutes) were used and because the majority of hatchery fish returns (between 1997 and 2001) derived from this broodstock were precocious males (60% mini jacks and 14% jacks) and stray rates averaged 18% between 1996-2002.	Hood River spring Chinook were extirpated.
LCR Coho	Coho (Bonneville/Cascade/Oxbow Complex - ODFW Stock #14)	Yes	Bonneville	Mitigation	John Day Dam Mitigation	COE/BPA	ODFW	Segregated	Harvest Research/education		"-" because these hatchery fish are highly domesticated. High stray rates (hatchery fish comprise 70-80% of the natural spawners) pose a risk to population productivity and diversity	
MCR Spring Chinook	Spring Chinook (Yakima R. Spring Chinook)	No	Cle Elum	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery Research/education			
LCR Steelhead	Steelhead (Hood R. Summer Steelhead)	Yes	HRPP- Parkdale/ Oak Springs	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW	Integrated	Harvest Conservation/recovery	"+" for increasing the number of natural spawners and preserving genetic resources. Research here is providing important hatchery steelhead productivity information		2004 UPA Safety-Net Program
LCR Steelhead	Steelhead (Hood R. Winter Steelhead)	Yes	HRPP- Parkdale/Oak Springs	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW	Integrated	Harvest Conservation/recovery	"+" for increasing the number of natural spawners and preserving genetic resources. Research here is providing important hatchery steelhead productivity information		2004 UPA Safety-Net Program

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Relevant ESU.	**Hatchery Program** (NOAA Fisheries designation)	**Included in ESU or DPS?****	**Primary Hatchery Facility for Program**	**Purpose** (as identified by Action Agencies)	**Authorization**	**Funding**	**Operator**	**Integrated or Segregated (Isolated) Program**, as identified by hatchery operator in HGMP	**Purpose**, as identified by hatchery operator in HGMP	**Beneficial Effect on Viability** (from NOAA draft Hatchery Effects Report)	**Risk or Threat to Viability** (from NOAA draft Hatchery Effects Report)	**Comments**
MCR Steelhead	Steelhead (Umatilla River Summer Steelhead - ODFW stock # 91)	Yes	Umatilla	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ CTUIR	Integrated	Harvest Conservation/recovery Research/education	Recovery program for preserving genetic resources and temporarily boosting the number of natural spawners. Natural origin fish abundance averaged more than 2,000 from 1999 thru 2004. Tech Recovery Team abundance threshold is 2250.	"-" because out of basin hatchery strays (stray rates (avg. of 5.4% between1992-2003) pose a potential risk to pop diversity and productivity. Note that fish from this program stray into other basins and pose a threat to pop diversity and productivity.	2004 UPA Safety-Net Program
MCR Steelhead	Steelhead (Walla Walla Summer Steelhead Program)	No	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Segregated	Harvest	**No Effect**	**No Effect**	
MCR Steelhead	Steelhead (Touchet Summer Steelhead Program)	No	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Segregated	Harvest		Negative effect on MCR steelhead DPS because non-indigenous naturally spawning hatchery fish potentially pose a risk to population diversity and productivity. Smolt releases reduced by 32% since 2001.	
MCR Steelhead	Steelhead (Touchet R. Endemic Summer Steelhead)	Yes	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Integrated	Conservation/recovery		Negative effect on MCR steelhead DPS because naturally spawning hatchery fish pose a risk to population diversity and productivity. Existing facilities are being updated to reduce risks.	
MCR Steelhead	Steelhead (Yakima River Kelt Reconditioning Program)	Yes	Prosser Tribal Hatchery	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	CRITFC YIN	N/A	Conservation/recovery	"+" Recovery program potentially can increase pop abundance and productivity. Post spawning natural fish are collected in lower Yakima basin, reconditioned, and released to return to their area of origin and spawn a second time		2004 UPA Safety-Net Program
N/A	Spring Chinook (Umatilla R. Spring Chinook)	N/A	Umatilla	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ CTUIR	Integrated	Harvest Conservation/recovery Research/education		Negative effects due to high stray rates. Umatilla Hatchery strays can approximate 5% of the natural spawners in the Tucannon River.	
N/A	Fall Chinook (Umatilla R. Fall Chinook)	N/A	Umatilla	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ CTUIR	Integrated	Harvest Conservation/recovery Research/education		Strays from this program pose a risk to diversity of the listed Snake River fall Chinook ESU. To reduce this risk, the federal Action Agencies are currently improving the adult salmon/steelhead trapping facilities at Lower Granite Dam on the Snake River to facilitate trapping and removal of these stray hatchery fish.	

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N/A	Coho (Umatilla River Coho) Master Plan	N/A	Umatilla	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	CTUIR	Integrated	Harvest Conservation/recovery			
N/A	Coho (Mid-Columbia Coho - Methow)	N/A	Winthrop NFH Entiat NFH Leavenworth NFH	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery			
N/A	Coho (Mid-Columbia Coho - Wenatchee)	N/A	Leavenworth NFH Entiat NFH Willard NFH Cascade	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery Research/education			
N/A	Coho (Yakima R. Coho)	N/A	Prosser Tribal Willard NFH Little White Salmon NFH	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery Research/education			
N/A	Coho (Naches R. Coho)	N/A	Prosser Tribal Willard NFH Little White Salmon NFH	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery Research/education			
N/A	Fall Chinook (Yakima R. - Marion Drain Stock)	N/A	Marion Drain	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Conservation/recovery Research/education			
N/A	Fall Chinook (Yakima R. Fall Chinook)	N/A	Prosser Tribal Little White Salmon NFH	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	YIN	Integrated	Harvest Conservation/recovery Research/education			
N/A	Coho (NP Coho - Clearwater Coho Restoration)	N/A	Clearwater Coho	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	NPTH	Integrated	Conservation/recovery			

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SR Fall Chinook	Fall Chinook (Lyons Ferry Fall Chinook)	Yes	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Integrated	Harvest Conservation/recovery Research/education	"+" because it has successfully jumpstarted natural production and improved spatial distribution. Also because the program includes genetic resources from areas taken out of production by the Hells Canyon Dams (i.e., the Marsing and Salmon Falls reaches). Since proposed for ESA protection in 1990, the population has grown from <100 annual returns to between 2100 and 5100. Hatchery intervention has accomplished its mission and successfully jumpstarted fall Chinook production. Acclimation facilities located in natural spawning areas. Pop abundance has been at or above the ESA recovery threshold in 2001and 03 (the ICTRT abundance threshold is 3,000 natural-origin spawners). Productivity of natural origin fish has been >1:1.		Expansion of the Lower Granite Dam adult trap (ongoing BPA Project # 2005-002-00) is expected to facilitate an increase in the proportion of natural fish in the broodstock at Lyons Ferry and NPTH and the trapping and removal of out of basin hatchery strays.
SR Fall Chinook	Fall Chinook (NPTH Fall Chinook)	Yes	Nez Perce Tribal	Conservation	Northwest Power Act - Council Fish & Wildlife Program	BPA	NPT	Unidentified	Conservation/recovery	"+" because the program has jump-started production by boosting the number of natural spawners and increasing spatial distribution. All releases are subyearling and all are marked. 400,00 of the intended 1.4 million releases designed to restore extinct early spawning life history form.		2004 UPA project
SR Fall Chinook	Fall Chinook (FCAP Fall Chinook)	Yes	Capt. John/Pittsburg Landing/Big Canyon	Conservation	Northwest Power Act - Council Fish & Wildlife Program	BPA	NPT	Integrated	Harvest; Conservation/recovery Research/education	See Lyons Ferry program.		
SR Sockeye	Sockeye (Snake River Captive Brood)	Yes	Eagle - IDFG Burley Creek - NOAA	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	IDFG/ NOAA	Integrated	Conservation/recovery Research/education	"+" for preserving and building Redfish Lake sockeye genetic resources until the factors limiting survival are addressed and for reintroducing sockeye into Alturas and Pettit lakes.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Lookingglass Hatchery (reintroduction))	Yes	Lookingglass	Conservation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" or re-introduction following extirpation. Historic hatchery practices blocked access and extirpated local population. Current reintroduction program is using nearest suitable stock (Catherine Creek).		

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SR Sp/Su Chinook	Spring Chinook (Lostine River Captive Brood)	Yes	Bonneville Captive Broodstock Facility Lookingglass Manchester	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ NOAA	Integrated	Harvest Conservation/recovery Research/education	"+" because this temporary captive broodstock program is preserving and building genetic resources. Straying from Lookingglass Hatchery Rapid River stock has been eliminated and no longer poses a threat to this population. The program is shifting to conventional smolt program.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Lostine River Conventional)	Yes	Lookingglass	Conservation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" Recovery Program preserves genetic resources and boosts the number of natural spawners until factors limiting survival are addressed		
SR Sp/Su Chinook	Spring Chinook (Catherine Creek Captive Brood)	Yes	Bonneville Captive Broodstock Facility Lookingglass Manchester	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ NOAA	Integrated	Harvest Conservation/recovery Research/education	"+" because this temporary captive broodstock program is preserving and building genetic resources.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Catherine Creek Conventional)	Yes	Lookingglass	Conservation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" Recovery supplementation program following practices that promote viability in the wild.		
SR Sp/Su Chinook	Spring Chinook (Upper Grande Ronde Captive Broodstock)	Yes	Bonneville Captive Broodstock Facility Lookingglass Manchester	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	ODFW/ NOAA	Integrated	Harvest Conservation/recovery Research/education	"+" Rescue program Temporary captive broodstock program to preserve and build genetic resources.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Upper Grande Ronde Conventional)	Yes	Lookingglass	Mitigation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" Recovery supplementation program following practices that promote viability in the wild		
SR Sp/Su Chinook	Spring Chinook (Imnaha River)	Yes	Lookingglass	Mitigation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" for successfully boosting the number of natural spawners	"-" for continued high hatchery influence that potentially disrupts natural selection. Since the program has successfully jumpstarted natural production, reducing the number of naturally spawning hatchery fish would reduce risk to pop diversity and productivity. Pop abundance at or above recovery threshold in 2001, 02 and 03. The proportion of naturally spawning HOF> proportion of NOF in the hatchery broodstock for 11 of 15 years between 1988 and 2003.	

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SR Sp/Su Chinook	Spring Chinook (Big Sheep Creek)	Yes	Lookingglass	Mitigation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	"+" for boosting the number of natural spawners. Surplus adults from the Imnaha program are planted into Big Sheep and Lick Creek.	"-" the longer the program uses Imnaha broodstock that is thought to have different life-history characteristics than Big Sheep Chinook and limit population diversity	
SR Sp/Su Chinook	Spring Chinook (Tucannon conventional)	Yes	Tucannon	Mitigation	LSRCP	LSRCP/BPA	WDFW	Integrated	Harvest Conservation/recovery		"-" for the Umatilla Chinook program because strays can approximate 5% of the natural spawners in the Tucannon	
SR Sp/su Chinook	Spring Chinook (Tucannon captive brood)	Yes	Tucannon	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	WDFW	Integrated	Conservation/recovery	"+" for preserving and building genetic resources after severe population declines during the mid 1990s. 2006 is the last year that captive broodstock adults will be used for hatchery broodstock.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Clearwater Spring Chinook)	No	Clearwater	Mitigation	LSRCP	LSRCP/BPA	IDFG	Segregated	Harvest Conservation/recovery Research/education			
SR Sp/Su Chinook	Summer Chinook (South Fork Salmon River)	Yes	McCall	Mitigation	LSRCP	LSRCP/BPA	IDFG	Integrated	Harvest Conservation/recovery	**Unknown**. Too early to determine if Recovery Supplementation has been successful or to determine effects of recent transition to an Isolated program. One way gene flow from hatchery to natural fish is likely until Idaho supplementation study is completed. McCall influence/straying in the Secesh is medium (10-25%) and is highest in large run-size years. Part of the Idaho Supplementation Study to be completed in 2012.	**Unknown**	
SR Sp/Su Chinook	Spring Chinook (Sawtooth Spring Chinook)	Yes	Sawtooth	Mitigation	LSRCP	LSRCP/BPA	IDFG	Integrated	Harvest Conservation/recovery Research/education			
SR Sp/Su C	Spring Chinook (Dworshak NFH Spring Chinook)	No	Dworshak NFH	Mitigation	LSRCP	LSRCP/BPA	USFWS	Segregated	Harvest			
SR Sp/Su Chinook	Spring Chinook (NPTH Spring Chinook)	No	Nez Perce Tribal	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	NPT	Integrated	Conservation/recovery Research/education			

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SR Sp/Su Chinook	Summer Chinook (Johnson Creek Summer Chinook)	Yes	McCall Hatchery - JCAPE	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	NPT	Integrated	Conservation/recovery	"+" because this program is designed to preserve summer Chinook salmon genetic resources until factors limiting recovery are addressed. Important supplementation experiment based on all-natural-origin local broodstock. Longer-term effects on productivity and diversity being evaluated.		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Salmon River Chinook Captive Rearing - East Fork Salmon River)	Yes	Eagle - IDFG Manchester Lab - NOAA	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	IDFG/ NOAA	Integrated	Conservation/recovery Research/education	"+" for investigating and improving knowledge of captive broodstock techniques. New genetic analysis is necessary to better establish population status		2004 UPA Safety-Net Program
SR Sp/Su Chinook	Spring Chinook (Salmon River Chinook Captive Rearing - West Fork Yankee Fork)	Yes	Eagle - IDFG Manchester Lab - NOAA	Safety-Net	Northwest Power Act - Council Fish & Wildlife Program	BPA	IDFG/ NOAA	Integrated	Conservation/recovery Research/education	"+" for investigating captive rearing techniques.		2004 UPA Safety-Net Program
SR Steelhead	Steelhead (Imnaha R. Summer Steelhead ODFW Stock #29)	Yes	Wallowa Irrigon	Mitigation	LSRCP	LSRCP/BPA	ODFW	Integrated	Harvest Conservation/recovery Research/education	**Unknown**	**Unknown**, but Broodstock comprised of >10% natural origin fish in only 6 of last 14 years and natural origin fish comprised >50% of the natural spawners in only 2 of last 14 years (high hatchery influence). Surveys indicate little or no straying by Little Sheep program fish.	
SR Steelhead	Steelhead (Wallowa R. Summer Steelhead ODFW Stock #56)	No	Wallowa Irrigon	Mitigation	LSRCP	LSRCP/BPA	ODFW	Segregated	Harvest		Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	
SR Steelhead	Steelhead (Lyons Ferry Summer Steelhead)	No	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Segregated	Harvest		Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	

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SR Steelhead	Steelhead (Cottonwood Pond)	No	Lyons Ferry	Mitigation	LSRCP	LSRCP/BPA	WDFW	Segregated	Harvest		"-" because hatchery fish are derived from areas outside the DPS and naturally spawning hatchery fish pose a potential risk to pop diversity and productivity in Cottonwood, Rattlesnake and Menatchee creeks	
SR Steelhead	Steelhead (Tucannon Summer Steelhead (Lyons Ferry stock))	No	Tucannon	Mitigation	LSRCP	LSRCP/BPA	WDFW	Segregated	Harvest		"-" because non DPS broodstock are isolated from most but not all Tucannon steelhead spawning areas. The existing hatchery weir is 70% effective and the most important habitat is upstream.	
SR Steelhead	Steelhead (Tucannon Summer Steelhead endemic stock)	Yes	Tucannon	Mitigation	LSRCP	LSRCP/BPA	WDFW	Integrated	Conservation/recovery	"+" because the supplementation program is intended to preserve and build genetic resources and boost the number of natural spawners. To early for any significant results.	Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	
SR Steelhead	Steelhead (Clearwater Summer Steelhead)	Yes	Clearwater	Mitigation	LSRCP	LSRCP/BPA	IDFG	Integrated	Harvest Conservation/recovery		Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	Dworshak NFH, Lolo Creek, and North Fork Clearwater programs are in DPS
SR Steelhead	Steelhead (Sawtooth)	No	Sawtooth	Mitigation	LSRCP	LSRCP/BPA	IDFG	Segregated	Harvest	"-" because naturally spawning hatchery fish are derived from outside the DPS and pose a potential risk to pop diversity and productivity	Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	

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SR Steelhead	Steelhead (East Fork Salmon River Natural)	Yes	Sawtooth	Mitigation	LSRCP	LSRCP/BPA	IDFG	Integrated	Conservation/recovery	**" +"** Recovery Program temporarily boosts the number of natural spawners until factors limiting survival are addressed. The population is at about 10% of its abundance goal	Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	
SR Steelhead	Steelhead (Salmon River B-Run Steelhead [Magic Valley Summer Steelhead])	No	Magic Valley	Mitigation	LSRCP	LSRCP/BPA	IDFG	Segregated	Harvest		Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	
SR Steelhead	Steelhead (Hagerman NFH Summer Steelhead)	No	Hagerman NFH	Mitigation	LSRCP	LSRCP/BPA	USFWS	Segregated	Harvest		Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	
SR Steelhead	Steelhead (Dworshak NFH Summer Steelhead)	Yes	Dworshak NFH	Mitigation	Dworshak Dam authorization (mitigation)	COE/BPA	USFWS	Segregated	Harvest Conservation/recovery	"+" because whatever NF Clearwater genetic resources that remain exist in this program	Snake River steelhead programs (in general): High stray rates from Snake River steelhead hatchery programs potentially disrupt natural selection process and pose a risk to diversity and productivity of downriver steelhead populations, particularly Deschutes River and John Day populations.	Dworshak NFH, Lolo Creek, and North Fork Clearwater programs are in DPS

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Relevant ESU.	**Hatchery Program** (NOAA Fisheries designation)	**Included in ESU or DPS?****	**Primary Hatchery Facility for Program**	**Purpose** (as identified by Action Agencies)	**Authorization**	**Funding**	**Operator**	**Integrated or Segregated (Isolated) Program**, as identified by hatchery operator in HGMP	**Purpose**, as identified by hatchery operator in HGMP	**Beneficial Effect on Viability** (from NOAA draft Hatchery Effects Report)	**Risk or Threat to Viability** (from NOAA draft Hatchery Effects Report)	**Comments**
UCR Spring Chinook	Spring Chinook (Leavenworth NFH Spring Chinook - Carson stock)	No	Leavenworth NFH	Mitigation	Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946.	BOR/BPA	USFWS	Segregated	Harvest		-" because straying from the program poses a potential risk to population diversity and productivity. Hatchery stock is not indigenous to the Wenatchee Basin, not included in the Upper Columbia Spring Chinook ESU, and they may comprise >5% of the natural spawners in areas important to spring Chinook recovery.	
UCR Spring Chinook	Spring Chinook (Entiat NFH Spring Chinook - Carson stock)	No	Entiat NFH	Mitigation	Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946.	BOR/BPA	USFWS	Segregated	Harvest		"-" because the program is not well isolated and naturally spawning hatchery fish pose substantial risk to population diversity and productivity. Entiat Hatchery Chinook are not indigenous to the Entiat and not included in the UCR spring Chinook ESU	
UCR spring Chinook	Spring Chinook (Winthrop NFH Spring Chinook - Methow Composite stock)	Yes	Winthrop NFH	Mitigation Conservation	Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946.	BOR/BPA	USFWS	Integrated	Harvest Conservation/recovery	"+" for preserving genetic resources when Chinook returns dropped to unprecedented low numbers and for sustaining naturally spawning and the spatial structure of Chinook until factors limiting Chinook productivity are addressed.	" -" because very few natural origin fish are incorporated into the broodstock program and because combining Methow R and Chewuch R fish for hatchery broodstock reduces pop diversity.	
UCR Spring Chinook	Summer/Fall Chinook - Chief Joseph Dam Hatchery	No	Chief Joseph Dam (design stage)	Harvest	Northwest Power Act - Council Fish & Wildlife Program	BPA	CCT	Integrated	Conservation/recovery Harvest			

*Attachment 4. Action Agency-funded Interior Columbia Basin Anadromous Hatchery Programs **

Relevant ESU.	**Hatchery Program** (NOAA Fisheries designation)	**Included in ESU or DPS?****	**Primary Hatchery Facility for Program**	**Purpose** (as identified by Action Agencies)	**Authorization**	**Funding**	**Operator**	**Integrated or Segregated (Isolated) Program**, as identified by hatchery operator in HGMP	**Purpose**, as identified by hatchery operator in HGMP	**Beneficial Effect on Viability** (from NOAA draft Hatchery Effects Report)	**Risk or Threat to Viability** (from NOAA draft Hatchery Effects Report)	**Comments**
UCR Steelhead	Steelhead (Winthrop NFH Summer Steelhead - Wells stock)	Yes	Winthrop NFH	Mitigation Conservation	Grand Coulee Dam Project, 49 Stat. 1028, August 30, 1935, as part of the Rivers and Harbors Act; reauthorized under the Columbia Basin Act, 57 Stat. 14, March 10, 1943; and the Fish and Wildlife Coordination Act, 60 Stat. 1080, August 14, 1946.	BOR/BPA	USFWS	Integrated	Harvest Conservation/recovery	"+" for stepping in to preserve genetic resources and boosting the number of naturally spawning fish when natural origin steelhead returns were < 200 fish for 5 of 6 years between 1993 and 1998	"-" for risks to pop diversity and productivity by collecting broodstock at Wells Dam and then introducing these fish in different areas throughout the Methow Basin. Hatchery origin fish comprise >90% of all natural spawners which also poses risks to pop diversity and productivity.	

*Table information sources: Hatchery/Harvest collaboration Workgroup's Draft Hatchery Effects Report, two-page HGMP summaries, NPCC's APRE website, and state/federal/PUD hatchery websites. **ESU information from: Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon and Final 4(d) Protective Regulations for Threatened Salmonid ESUs. Federal Register, Vol. 70, No. 123. Tuesday, June 28, 2005, and Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. Federal Register, Vol. 71, No.3, Thursday, January 5, 2006.