Revision Sheet for the Springfield Sockeye Hatchery Project Final Environmental Assessment

DOE/EA-1913

Summary

This revision sheet documents the changes to be incorporated into the Springfield Sockeye Hatchery Project Preliminary Environmental Assessment (EA). With the addition of these changes, the Preliminary EA will not be reprinted and will serve as the Final EA.

The Preliminary EA was made available for public and agency review and comment on December 16, 2011. Notification that the Preliminary EA was available, as well as information regarding how to request a copy, was sent to individuals on the mailing list of potentially affected parties, including adjacent landowners, county commissioners, the Environmental Protection Agency, Idaho Department of Fish and Game (IDFG), tribal chairpersons, and the Stanley Basin Technical Oversight Committee. Comments on the Preliminary EA were accepted until January 18, 2012. Bonneville Power Administration (BPA) received a total of five substantive comment letters. The "Public Comments" section below presents the comments received and BPA's responses to those comments.

Revisions to the EA

A number of changes were made to the Preliminary EA and are presented below by the chapter and section in which they appeared in the Preliminary EA (new text is underlined; deletions are shown with strikethrough).

Chapter 1—Purpose of and Need for Action

1.4 BACKGROUND

<u>*1.4.1 Northwest Power Act*</u>

BPA is a federal power marketing agency that is part of the U.S. Department of Energy (DOE). BPA's operations are governed by several statutes, such as the Northwest Power Act. Among other things, this Act directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the Federal Columbia River Power System (FCRPS). To assist in accomplishing this, the Act requires BPA to fund fish and wildlife protection, mitigation, and enhancement actions consistent with the Northwest Power and Conservation Council's (NPCC's) Fish and Wildlife Program. Under this program, the NPCC makes recommendations to BPA concerning which fish and wildlife projects to fund.

The NPCC has a three-step process for review of artificial propagation projects (i.e., hatcheries) proposed for funding by the BPA (Northwest Power and Conservation Council 2006). Step 1 is conceptual planning, represented primarily by master plan development and approval. Step 2 is preliminary design and cost estimation, along with environmental review. Step 3 is final design review and construction. The NPCC's Independent Scientific Review Panel (ISRP) reviews the proposed projects as they move from one stage of the process to the next.

The NPCC established a statutory structure that "makes it clear that the NPCC Fish and Wildlife Program was to be developed through a detailed and deliberate process of consultation with fishery managers who have great experience and expertise with fish and wildlife protection."[1] As mentioned previously, BPA's duties under the Northwest Power Act include protecting and mitigating impacts on fish and wildlife affected by the FCRPS dams and taking the NPCC's program into account to the fullest extent possible (16 USC Sections 839b(h)(10)(A) and (11)(A)(i)). Under the National Environmental Policy Act (NEPA), BPA must take an independent, hard look at a reasonable number of alternatives, yet the Northwest Power Act and the cases interpreting it encourage BPA to refrain from inventing its own mitigation plans that are not "consistent with" the NPCC's program.

To ensure compliance with NEPA and the Northwest Power Act, BPA typically implements mitigation in response to recommendations made by the NPCC. And when an NPCC recommendation triggers NEPA, BPA implements the recommendation after seeking and examining other reasonable alternatives that meet BPA's stated purposes and need.

BPA's response to the NPCC's project recommendations for the period 2007–2009 shows how BPA balances its legal requirements to assume responsibility for fulfilling its mitigation responsibilities in a manner consistent with the NPCC's program for all actions pursuant to both regulations. As presented in a letter to Dr. Tom Karier, Chair, NPCC, from Gregory K. Delwiche, Vice President, Environment, Fish, and Wildlife, BPA (Delwiche pers. comm.):

> BPA endeavored to supplement the NPCC's recommendations whenever possible, and not to supplant them. That BPA has some additional criteria springs naturally from the different legal obligations the agencies have, such as BPA's requirements to comply with the in lieu prohibition and the ESA. The result of this is that in some cases BPA independently exercised its discretion in choosing different projects for fulfilling its mitigation and recovery responsibilities.
>
> In making its decision, BPA considered the program, the NPCC's project recommendations, and the most current thinking about offsite mitigation needs that may be incorporated into a new FCRPS Proposed Action for ESA Section 7 compliance. In the limited instances when BPA did not adopt an NPCC-recommended project, it did so on the basis of biological effect, implementation priority, and mitigation responsibility. Among the reasons that BPA diverged in part from NPCC's project recommendations are: the recommended project did not appear to address the effects of the FCRPS, the project raised a statutory in lieu prohibition on BPA's ability to fund, or the recommended project was counter to BPA's reinvention initiatives associated with its implementation of the program. In some cases, all of these factors weighed together in BPA's evaluation of NPCC recommendations.

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[1] *Northwest Resource Info. Ctr. v. Council*, 35 F.3d 1371, 1388 (9th Cir. 1994).

Additionally, in some instances BPA has decided to fund a specific project identified in the solicitation process, reviewed by the ISRP, but not recommended by the NPCC. In these cases, the primary reason for the divergence from the NPCC is BPA's determination that it needs the project in order to meet its obligations under the ESA and/or under the 2007 Interim Operations Agreement. BPA greatly appreciates the NPCC's support for integrating the agency's ESA needs into its project recommendations and sought to utilize the NPCC's recommendations in this regard whenever possible. Ultimately, however, the burden of integration falls to BPA, inasmuch as the NPCC is not a federal entity subject to the consultation requirements of Section 7 of the ESA. In a limited few instances, BPA determined it needed projects to fulfill its obligations that the NPCC did not recommend. Still, in all cases, the selected projects fulfill one or more of the program strategies.

The additional criteria outlined in the letter do not apply to the Proposed Action. There is no other entity authorized or required to fund the hatchery, so the in lieu prohibition[2] of the Northwest Power Act is not triggered. The FCRPS Biological Opinion includes the need for the proposed increase in sockeye production. Therefore, Endangered Species Act (ESA) compliance supports consideration of the Proposed Action. BPA does not have any reinvention or other policy needs to address that could conflict with the Proposed Action. Therefore, the additional criteria that BPA considers beyond consistency with the NPCC's program do not lead BPA to diverge from the NPCC's recommendation to consider funding the Proposed Action.

1.4.2 Endangered Species Act

In addition to Northwest Power Act obligations, BPA, as a federal agency, also must comply with the Endangered Species Act (ESA) (16 USC 1531 et seq.). As discussed above, Biological Opinions have been issued for the FCRPS that include a number of measures related to the Snake River sockeye salmon evolutionarily significant unit (ESU), which was listed as endangered under the ESA in 1991. That same year, but before the listing of this ESU, IDFG initiated the Snake River Sockeye Captive Broodstock Program (Program) in response to the decline of ***anadromous***[3] returns to the Sawtooth Valley in central Idaho. The Program was initiated to conserve and rebuild this ESU and thus serves to further efforts at recovering this ESA-listed species. BPA has historically been a source of funding for activities under this program.

1.4.3 Snake River Recovery Plan

The National Oceanic and Atmospheric Administration (NOAA) Fisheries is in the process of preparing a recovery plan for Snake River sockeye salmon. IDFG has provided scientific advice in the form of a draft recovery plan that identifies several strategies to achieve recovery. This draft plan is presented as Appendix C in the Springfield Sockeye Hatchery Master Plan and includes using state-of-the-art hatchery facilities, captive broodstock, genetic support, and a comprehensive monitoring and evaluation program to continue rebuilding the population. IDFG and NOAA Fisheries, the Program cooperators, acknowledge no federal recovery plan is in place and have continued to move forward with the collaboration of scientists from state, federal, and tribal entities to help guide maintenance and recovery efforts.

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[2] 16 USC 839b(h)(10)(A)(Expenditures of the Administrator [to protect, mitigate, and enhance fish and wildlife]… shall be in addition to, not *in lieu of*, other expenditures authorized or required from other entities under other agreements or provisions of law) (emphasis added).

[3] Anadromous – ascending rivers from the sea for breeding.

1.4.4 Snake River Sockeye Captive Broodstock Program and the Proposed Action

The Program is now co-managed by IDFG and NOAA Fisheries. Current production of Snake River sockeye salmon is restricted to broodstock maintenance at facilities in Idaho (IDFG Eagle Hatchery) and Washington (NOAA facilities), and insufficient incubation and rearing space continues to limit development of a necessary full-term ***smolt***[4] program. This limitation has prevented IDFG and NOAA Fisheries from advancing the Snake River Sockeye Captive Broodstock Program beyond the conservation phase.

To help address this situation, IDFG developed a master plan in 2010 for modification of its existing hatchery near the town of Springfield in Bingham County, Idaho, as the next phase of the Snake River Sockeye Captive Broodstock Program. ~~This~~ The main goal of this plan, entitled the *Springfield Sockeye Hatchery Master Plan for the Snake River Sockeye Program* (Springfield Sockeye Hatchery Master Plan) (Idaho Department of Fish and Game 2010), is to increase the number of naturally spawning adults. The Master Plan describes IDFG's plans to redevelop the existing hatchery to create a facility capable of rearing up to 1 million Snake River sockeye salmon smolts annually for release in the Upper Salmon River Subbasin ~~and in the Sawtooth Basin~~. This production is intended to build on the captive broodstock phase and respond to population re-colonization goals in Redfish~~,~~ and Pettit~~, and Alturas~~ lakes in Idaho. Broodstock would continue to be collected and provided by the existing activities under the ongoing Snake River Sockeye Captive Broodstock Program until a time when broodstock collection may be phased out.

Under the Springfield Sockeye Hatchery Master Plan, IDFG considered several alternatives, including continuing the Program indefinitely or eliminating the captive broodstock program and relying on natural production alone. BPA considered the alternatives evaluated in the Springfield Sockeye Hatchery Master Plan to inform the analysis of alternatives considered in the Preliminary EA.

IDFG submitted the Springfield Sockeye Hatchery Master Plan to the NPCC in December 2010. The NPCC then asked the ISRP to review the Springfield Sockeye Hatchery Master Plan. The ISRP concluded that the Springfield Sockeye Hatchery Master Plan met the requisite scientific review criteria but requested clarification of certain issues during Step 2 (Independent Scientific Review Panel 2011a). After the ISRP's decision, the NPCC approved the Springfield Sockeye Hatchery Master Plan in April 2011 and recommended that BPA fund IDFG to proceed to Step 2. ~~The Springfield Master Plan was submitted by IDFG to the NPCC in December 2010 for Step 1 of the NPCC's review process for artificial propagation projects and has been approved by the NPCC. In April 2011, the NPCC approved the Springfield Master Plan and authorized IDFG to proceed to Step 2 of the process. Therefore, IDFG is proceeding with preliminary design and cost estimation, including requesting funding from BPA for the Proposed Action. This EA will serve to address the requirement in Step 2 of the NPCC's process for environmental review.~~

[4] Smolt – A young salmon when it becomes covered with silvery scales and first migrates from fresh water to salt water.

As part of Step 2, IDFG has obtained preliminary designs and cost estimates and has requested funding from BPA for modification of the Springfield Hatchery. BPA is completing its environmental review, which included issuance of the Preliminary EA under NEPA in December 2011. The Preliminary EA incorporated by reference the findings from the Springfield Sockeye Hatchery Master Plan and its appendices. It also addressed the issues raised by the ISRP and the public during the Preliminary EA scoping.

By the time the NPCC recommended the Springfield Hatchery to BPA for Step 2 funding and NEPA analysis, the proposal had already undergone rigorous and lengthy planning and review processes, including three separate scientific reviews—one each by NOAA Fisheries, the ISRP, and the Hatchery Review Science Group (HRSG). The Pacific Hatchery Reform Project was established by the U.S. Congress in 2000 in recognition that, although hatcheries play a legitimate role in meeting harvest and conservation goals for Pacific Northwest salmon and steelhead, the hatchery system was in need of comprehensive reform. The HSRG is the project's independent scientific review panel, which has reviewed all state, tribal, and federal hatchery programs in Puget Sound and Coastal Washington and in the Columbia River Basin. The Proposed Action considers and incorporates the recommendations of each of the reviewing agencies mentioned above, including the HSRG.

Chapter 2—Alternatives Description

In addition to the specific references in the description of the Proposed Action and alternatives listed below, all references to outstocking occurring within Alturas Lake are hereby removed from the EA. As indicated further in the response to Comment SHEA 0002, because of the development of additional information since issuance of the Preliminary EA, outstocking at Alturas Lake is no longer considered part of the Proposed Action.

2.1 PROPOSED ACTION

Once the hatchery is operational, broodstock would continue to be collected at existing facilities as part of the ongoing program and fertilized eggs would be transported to the hatchery for rearing. No changes to activities are proposed at any of the broodstock collection facilities under the Proposed Action. Fish produced at the hatchery would be transported and released to native waters located in the Upper Salmon River Basin of central Idaho, including Redfish~~,~~ and Pettit ~~and Alturas~~ lakes and their associated outfalls (Figure 2-2). IDFG would continue to maintain recreational uses of Crystal Springs Pond.

2.1.1 Project Elements

Hatchery Operation and Effluent Treatment

Once fish reach ~~maturity~~ smolthood, they would be released into Redfish Lake Creek and ~~Pettit, and Alturas lakes and the associated outflow streams~~ the Salmon River (upstream of Sawtooth Fish Hatchery). Smolts would be transported from the proposed hatchery to the outstocking locations each spring. This process would require about 40 truck trips annually, and would take place over 2 to 3 weeks.

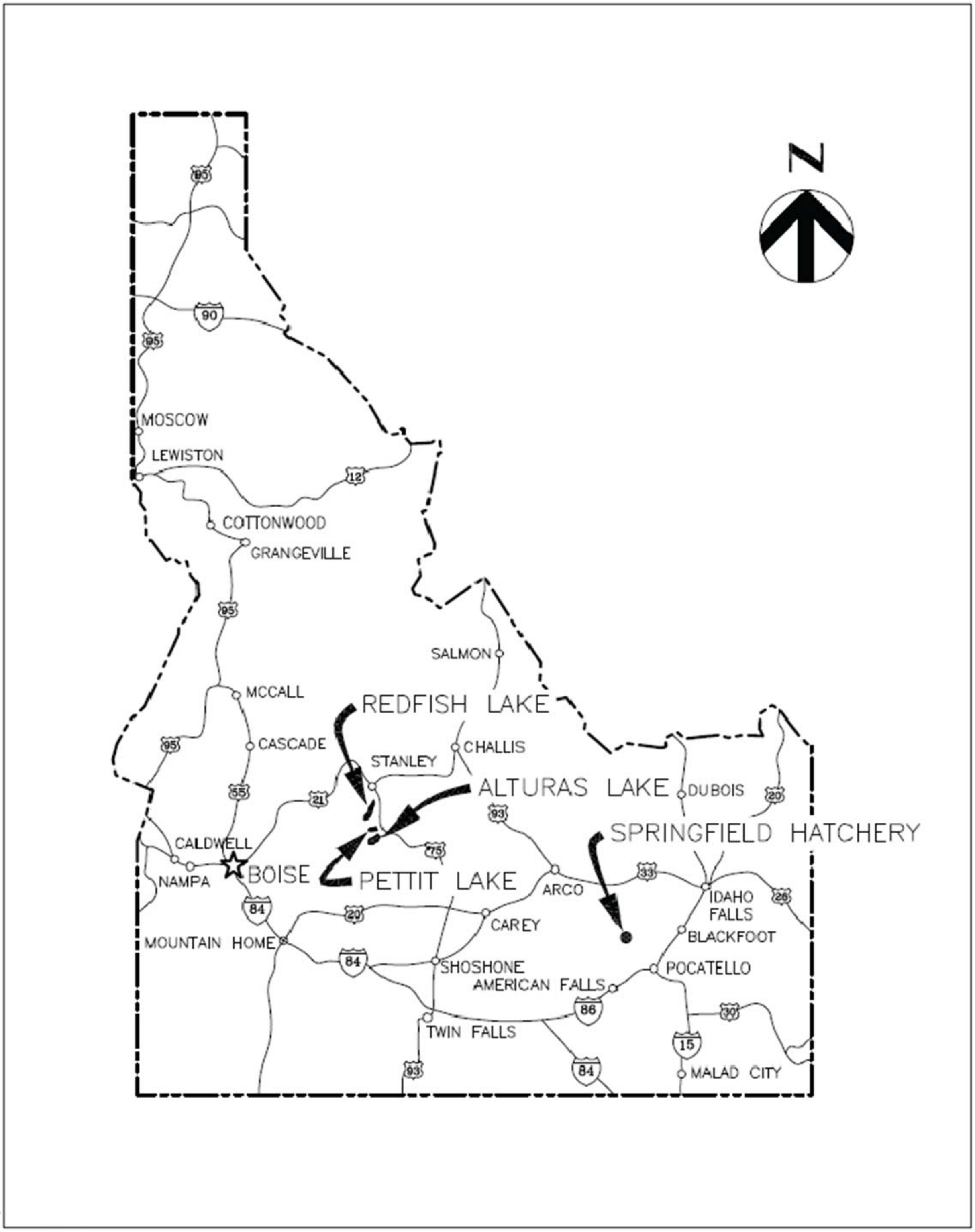

Figure 2-2
Proposed Outstocking Locations

Adaptive Management

Under the ongoing Program, the Program cooperators (IDFG and NOAA Fisheries) are participating in various research, monitoring, and evaluation activities to assess the effectiveness and outcomes of the Program. These activities include those identified in the draft Hatchery Genetic Management Plan (HGMP) (Appendix A of the Springfield Sockeye Hatchery Master Plan) and decision triggers and decision rules based on natural- and hatchery-origin adult returns to the basin. Collectively, information from these programs would be used to manage the Program adaptively on a yearly basis. Relevant performance standards, risks, and proposed adaptive management monitoring activities are summarized in Appendix E of this EA.

As adult run size increases, the goal of the triggers is to eliminate redundant facilities (e.g., those needed for captive brood) and to determine when the Program transitions to the next phase of implementation. Because the run size defines when actions are to be taken, the timeframe for implementing major milestones is uncertain. However, the ability to measure the triggers would be highly accurate because of the managers' ability to quantify adult returns at weirs and hatchery facilities.

2.2 NO ACTION ALTERNATIVE

~~Fish are released in May of each year.~~ Juvenile and sockeye salmon are released throughout the year. This typically requires approximately 30 truck trips over a 2-week period. ~~Smolts are released to the following locations~~. The current release objectives are listed below:

- 50,000 ***eyed-eggs***[5] planted in egg boxes in Pettit Lake during the month of December
- 100,000 pre-smolts planted in Redfish~~, Alturas,~~ and Pettit lakes (combined release) during the month of October
- 150,000 smolts planted at the outlet of Redfish Lake and in the Salmon River upstream of the Sawtooth Hatchery during the month of May
- 400 full-term captive brood hatchery adults planted in primarily Redfish Lake during the month of September

[5] Eyed-eggs – stage in the development of a fish egg, where the embryo has developed enough so the eyes are visible, that also indicates the egg is less sensitive to movement and can be handled or transported safely.

Chapter 3—Affected Environment, Environmental Consequences, and Mitigation Measures

3.4 VEGETATION

3.4.2 Environmental Consequences – Proposed Action

Rare, Threatened, and Endangered Plant Species

Suitable habitat for Ute ladies'-tresses consists of various wetland habitats, which do occur in the study area. This species is also known to colonize areas that have become wet as a result of human development, for example, areas associated with dams, levees, reservoirs, irrigation ditches, and irrigated meadows (Fertig et al. 2005). Populations of Ute ladies'-tresses were not observed during reconnaissance-level or protocol-level surveys in 2011. Additionally, dense vegetative cover was observed along the stream channels and other potential wetland habitat in the study area. Ute ladies'-tresses typically occurs in openings in vegetation and dense vegetative cover is thought to preclude Ute ladies'-tresses (Fertig et al. 2005).

No populations of Ute ladies'-tresses have been observed historically or were observed during 2011 field surveys of the study area and only marginally potential habitat was observed. As indicated through consultation with the U.S. Fish and Wildlife Service, activities in the Sawtooth Valley would not require any new ground disturbance, and the orchid is not known to occur in this area (Kelly pers. comm.). Therefore, there is low likelihood that this species could occur in the study area and could be affected by the Proposed Action.

Potential impacts on rare, threatened, and endangered plant species, assuming they exist in the study area, could range from low to high depending on the extent of the disturbance or impact. High impacts could occur if individual plants are crushed or killed. This is because any loss or disturbance to rare, threatened, or endangered species would be significant in the context of their limited population sizes. Potential impacts that indirectly affect these species, or that can largely be mitigated with the implementation of the mitigation measures described below, would range from low to moderate, depending on the extent of the disturbance and the ability to adequately mitigate. Based on reconnaissance-level and protocol-level surveys, however, it is unlikely that any rare, threatened, and endangered plant species would be affected by the Proposed Action.

3.5 WATER QUALITY AND WATER QUANTITY

3.5.3 Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG will implement the following measures to avoid or minimize impacts on water quality and water quantity:

- Design and construct access roads to minimize drainage from the road surface directly into surface waters and direct sediment-laden waters into vegetated areas.

- Review water quality mitigation measures, required best management practices (BMPs), and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.
- Conduct peak construction activities during the dry season (between June 1 and November 1) as much as possible to minimize erosion, sedimentation, and soil compaction.
- Delineate construction limits within 200 feet of streams, other waterbodies, and wetlands; manage sediment as specified in a Stormwater Pollution Prevention Plan with a sediment fence, straw wattles, or a similarly approved method that meets the U.S. Environmental Protection Agency's (EPA's) erosion and stormwater control BMPs or any other applicable permit requirements to eliminate sediment discharge into waterways and wetlands; minimize the size of the construction disturbance areas; and minimize removal of vegetation to the greatest extent possible.
- Minimize the size of construction disturbance areas, and minimize removal of vegetation to the greatest extent possible.
- Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery site when vegetation is re-established and the area has been stabilized.
- Implement a Spill Prevention, Control, and Countermeasures Plan that requires fuel and other potential pollutants to be stored in a secure location at least ~~150~~ 200 feet away from streams, waterbodies, and wetlands; ensure that spill containment and cleanup materials will be readily available on site and, if used, restocked within 24 hours; and, in the event of a spill, ensure that contractors will be trained to contain the spill immediately, eliminate the source, and deploy appropriate measures to clean up and dispose of spilled materials in accordance with federal, state, and local regulations.
- Restrict refueling and servicing operations to locations where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes) at least ~~150~~ 200 feet from streams, waterbodies, and wetlands; use pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.
- Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of ~~150~~ 200 feet away from any stream, waterbodies, and wetlands.
- Prohibit the discharge of vehicle wash water into any stream, waterbody, or wetland without pretreatment to meet state water quality standards.
- Reseed disturbed areas at the first practical opportunity after construction and regrading are complete, at the appropriate time period for germination.
- Monitor germination of seeded areas with at least three field visits per year until the proposed hatchery site has achieved stabilization (defined as at least 70% cover by native or acceptable non-native species); if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils. ~~And if vegetation cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.~~

- Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.
- Monitor water quality at Crystal Springs Pond and change hatchery water use to provide more flow through to the pond, if needed, thereby ensuring maintenance of water quality parameters, including temperature, dissolved oxygen, and chlorophyll a concentrations.

3.8 GEOLOGY AND SOILS

3.8.3 Mitigation—Proposed Action

NPDES regulations would require the facility to implement an Erosion and Sedimentation Control Plan. Bingham County construction codes would require proper seismic design and proper design for the expanded septic system, both of which would be subject to design review by Bingham County before construction permits could be issued. In addition to these required regulatory BMPs, if the Proposed Action is implemented, IDFG would implement the following mitigation measures to minimize impacts on soils:

- Use appropriate shoring for all excavation conducted during facility construction as required by local and federal safety regulations.
- Design the proposed expansion of the existing septic system to accommodate the tight, loamy soils at the proposed hatchery.
- Conduct peak construction activities during the dry season (between June 1 and November 1) as much as possible to minimize erosion, sedimentation, and soil compaction.
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.
- Delineate construction limits within 200 feet of streams, other waterbodies, and wetlands; manage sediment as specified in a Stormwater Pollution Prevention Plan with a sediment fence, straw wattles, or a similar method that meets ~~NPDES~~ EPA’s erosion and stormwater control BMPs or any other applicable permit requirements to eliminate sediment discharge into waterways and wetlands; minimize the size of construction disturbance areas; and minimize removal of vegetation to the greatest extent possible.
- Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery area when vegetation is reestablished and the area has been stabilized.
- Design and construct access roads to minimize drainage from the road surface directly into surface waters, and direct sediment-laden waters into vegetated areas.
- Reseed disturbed areas at the first practical opportunity after construction and regrading are complete.
- Monitor seed germination of seeded areas with at least three field visits per year until the proposed hatchery site has achieved stabilization (defined as at least 70% cover by native or acceptable non-native species); if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.

- Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.
- Implement dust abatement during construction.

3.9 FISH AND WILDLIFE

3.9.2 Environmental Consequences—Proposed Action

Operation

The proposed hatchery would be operated under the *Springfield Sockeye Hatchery Master Plan*, and would be consistent with the mitigation ordered in the Biological Opinion for operation of the FCRPS (National Oceanic and Atmospheric Administration Fisheries 2008). The proposed hatchery would allow for the ongoing Program to operate at full capacity by increasing the number of released smolts from 200,000 to up to 1 million. The majority of the activities related to the broodstock collection, outmigration sampling, and release/outplanting of smolts would continue occur in a similar manner regardless of whether the Proposed Action is implemented (Kelly pers. comm.). Production of up to 1 million smolts would be required to achieve an average annual escapement of 2,000 fish over two generations. As discussed in the *Springfield Sockeye Hatchery Master Plan*, certain design features are being considered to manage the risk of disease and monitor success. For example, as discussed in Chapter 2, Alternatives Description, conveyance of pathogen-free groundwater and features to isolate batches of eggs would be used to prevent disease transmission within the proposed hatchery. To date, the Program has not introduced any exotic pathogens in the Snake River Basin, nor have common pathogens increased in prevalence or amplified in intensity in this area (Kelly pers. comm.). Chemical treatments would be used to prevent infection, and to sanitize hatchery elements. Outdoor raceways would be covered to prevent disease vectors (birds) from transmitting disease (particularly the Infectious Hematopoietic Necrosis Virus) from nearby waters (e.g., Crystal Springs Pond) to the hatchery smolts. Hatchery staff would also conduct health inspections of cultured fish, and a pathologist would implement corrective actions as needed. Fish raised at the proposed hatchery would only be released if they are certified by a pathologist to be disease-free (Idaho Department of Fish and Game 2010). Therefore, potential impacts on fish downstream of the proposed hatchery from increased exposure to disease would be low.

Release of sockeye smolts also has the potential to affect other fish species. The smolts would be released when they were ready to migrate relatively quickly downstream, along with other anadromous salmonids. Current hatchery sockeye passive-integrated-transponder (PIT) tag data have identified the average travel time from the Sawtooth Basin to Lower Granite Dam for hatchery-produced smolts to be between 9 to 15 days (Idaho Department of Fish and Game unpublished data). The speed required to travel to lower Granite Dam in the timeframe above minimizes competition or density-dependence effects within the stream from smolt releases. Presumably bull trout downstream of the smolt releases would prey on some of the smolts released, benefitting from the increased sockeye outmigration resulting from the Proposed Action. Returning adult salmon would also incrementally add to the nutrient budget of the lakes and streams. These would both be beneficial impacts on bull trout (Kelly pers. comm.). A study of predation in Redfish and Alturas lakes conducted in 1993 indicated that the stomach contents of bull trout from these lakes contained 89% *O. nerka* (sockeye or ***kokanee***[6]) (Bonneville Power Administration 1995).

Sockeye smolts would share habitat with other salmonids in the Salmon, Snake, and Columbia rivers during their migration to the Pacific Ocean. All of the species present in these systems evolved in coexistence and generally in much higher numbers than are currently found, or that would occur during operation of the Proposed Action. Additionally, sockeye salmon smolts eat plankton, and although they would be present at the same time as other fish species, including bull trout, given the rapid rate of smolt movement though the system and the separation in prey preference, interspecific competition between sockeye and bull trout is expected to be minimal (Kelly pers. comm.). Therefore, competition for space and prey is not expected to significantly affect any of these species and impacts of the Proposed Action on ESA-listed fish species would be low.

Proposed hatchery releases have the potential to affect the genetic makeup and consequent fitness of the population that the hatchery is supporting. ~~IDFG is completing a draft HGMP to work with NOAA Fisheries to address potential impacts from genetic interactions (Idaho Department of Fish and Game 2010).~~ Under the ongoing Program, the Program cooperators (IDFG and NOAA Fisheries) are participating in various research, monitoring, and evaluation activities to assess the effectiveness and outcomes of the Program. These activities include those identified in the draft HGMP (Appendix A of the Springfield Sockeye Hatchery Master Plan) and decision triggers and decision rules based on natural- and hatchery-origin adult returns to the basin. Capturing broodstock throughout the return and spawning period, genetic testing, and broodstock selection would be used to ensure ~~maintaining~~ the genetic diversity of the broodstock used in production of the proposed hatchery. The draft HGMP includes performance standards, indicators of performance and monitoring and evaluation requirements. Collectively, information from these programs would be used to manage the Program adaptively on a yearly basis. Relevant performance standards, risks, and proposed adaptive management monitoring activities are summarized in Appendix E of this EA. As adult run size increases, the goal of the triggers is to eliminate redundant facilities (e.g., those needed for captive brood) and to determine when the Program transitions to the next phase of implementation. Because the run size defines when actions are to be taken, the timeframe for implementing major milestones is uncertain. However, the ability to measure the triggers would be highly accurate because of the managers' ability to quantify adult returns at weirs and hatchery facilities. Implementation of these measures would ensure that potential impacts associated with genetic interactions would be low.

In addition, IDFG has been working with NOAA Fisheries to develop a recovery plan for Snake River sockeye. IDFG has submitted a draft Snake River Sockeye Salmon Recovery Strategy to NOAA Fisheries for consideration and incorporation into recovery planning (see Appendix C of Springfield Sockeye Hatchery Master Plan). The IDFG strategy involves three phases and incorporates the use of hatchery facilities, captive broodstock technology, genetic support, and a comprehensive monitoring and evaluation plan to maintain the population and continue rebuilding numbers of sockeye in the wild. The Proposed Action would facilitate implementation of Phase 1.

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[6] Kokanee – form of sockeye salmon that do not migrate to the ocean to feed and are typically smaller than sockeye salmon.

Essential fish habitat for Chinook salmon and critical habitat for Columbia River DPS bull trout, Snake River ESU sockeye, and Snake River ESU steelhead are located in the Upper Salmon River portion of the study area. Because the Proposed Action would result in no alterations to these areas, effects on critical habitat are considered insignificant, discountable, and beneficial. Direct effects on bull trout resulting from capture and handling and outmigration sampling have been addressed via the Section 6 cooperative agreement and associated Section 10 take permit between IDFG and USFWS under the ESA (Kelly pers. comm.). This agreement allows a specified level of take, including injury or death to a limited number of bull trout individuals. However, the permitted research activities have a beneficial effect on bull trout populations and contribute to recovery of the species through improved management, which is made possible by an increased understanding of the population size, life history, and condition of the fish captured. ~~there would be no impact on essential fish habitat or critical habitat.~~ There is no essential habitat or designated critical habitat for fish species in the Snake River portion of the study area.

3.9.3 Mitigation–Proposed Action

If the Proposed Action is implemented, IDFG would carry out the following mitigation measures to avoid or minimize impacts on fish and other aquatic species.

- Delineate construction limits within 200 feet of streams, other waterbodies, and wetlands; manage sediment as specified in a Stormwater Pollution Prevention Plan with a sediment fence, straw wattles, or a similarly approved method that meets EPA's erosion and stormwater control BMPs to eliminate sediment discharge into waterways and wetlands; minimize the size of construction disturbance areas; and minimize removal of vegetation to the greatest extent possible.
- ~~Implement required BMPs associated with the NPDES permit.~~
- Use settling ponds to remove organic waste (i.e., uneaten food and feces) from the proposed hatchery water to minimize the discharge of these substances to the receiving waters.
- Use therapeutic chemicals only when necessary, typically for short durations, to be in conformance with accepted standard practices and treatment applications.
- Ensure that the proposed hatchery facilities are operating in compliance with all applicable fish health guidelines and facility operation standards and protocols by conducting annual audits and producing reports that indicate the level of compliance with applicable standards and criteria.

3.9.5 Cumulative Impacts – Proposed Action

Fish and Aquatic Species

As described in Chapter 1, Introduction, and discussed in greater detail in Appendix A, sockeye broodstock are currently collected in support of the ongoing ~~Sockeye Salmon Recovery Program~~ Snake River Sockeye Captive Propagation (BPA 2007-402-00). Operation of the Proposed Action would rely on broodstock collected at the permanent trap at a barrier on the Upper Salmon River at IDFG's Sawtooth Hatchery and a temporary trap installed each year in Redfish Lake Creek approximately 1 mile below the outlet of Redfish Lake. There is also an existing trap at Lower Granite Dam that serves as a secondary collection site that could be used when fish returns are low. Broodstock collection has the potential to result in cumulative effects on fish and aquatic species associated with this activity.

Collection of sockeye broodstock has a potential to affect other fish species through unintentional capture during collection. The potential for this to occur is low for most fish species because they migrate at different times compared to sockeye. For example, spring-/summer-run Chinook salmon and steelhead spawn earlier in the year than Snake River sockeye, and are therefore, unlikely to be detained in the traps during sockeye broodstock collection. Based on IDFG observations, the smolt traps do not appear to impede upstream or downstream migration of bull trout, and juvenile bull trout have not been observed in the smolt traps. Incidental capture and subsequent handling activities associated with outmigration sampling are covered by an existing ESA Section 6 cooperative agreement and associated ESA Section 10 take permit between IDFG and USFWS (Kelly pers. comm.). However, bull trout migrate at the same time as sockeye and some are caught incidentally along with Sockeye salmon.

Although the Proposed Action would require fish provided by the existing collection facilities, no changes to these ongoing activities are proposed as part of this Proposed Action. Incidental capture of bull trout occurs during broodstock collection. Broodstock collection currently occurs at the Redfish Lake Creek trap and on the Salmon River near the Sawtooth Fish Hatchery between July 10 and October 20 each year. IDFG anticipates handling and releasing fewer than 200 bull trout per year at the Redfish Lake Creek weir and between 30 and 50 from the Sawtooth Fish Hatchery weir. Incidental capture and subsequent handling of bull trout at these facilities is currently addressed by the same ESA Section 6 cooperative agreement as noted above (Kelly pers. comm.). Therefore, the Proposed Action would not result in any changes to contribute to a cumulative impact associated with broodstock collection.

3.10 CULTURAL RESOURCES

3.10.1 Affected Environment

During the consultation process under Section 106 of the National Historic Preservation Act, BPA received a response from the State Historic Preservation Office stating that its office believed that the Crystal Springs Hatchery is eligible for inclusion on the National Register of Historic Places (NRHP) based on the age of the structures (dating to the 1950s) and that it was rumored to be the largest privately owned hatchery in the west. In order to confirm the age of the structures present and source of this claim, BPA hired an architectural historian to provide additional historical context for the hatchery, and to reassess the eligibility. The following information comes from the technical memo detailing the results of this additional work (Sneddon and Miller 2012).

Traditional Resources

The study area is located in a marginal region of the Columbia Plateau where it gradually merges into the Great Basin. This area is characterized by geological features, plants and animal communities, and waterways that are important to traditional Native American use. Northward from the Great Basin, reliance on grasses gradually shifts to reliance on edible roots (e.g., camas). Salmon was also an important resource in the Snake River basin and southern tributaries of the Salmon River. Trout, perch, and other fish were found in streams throughout the region.

Prior to European settlement, large game animals were abundant in the area and served as important resources to the Northern Shoshone, Bannock, and Paiute tribes. Buffalo were hunted in groups using a technique of flanking the herds on horses and dispersing the animals using bow and arrow. Antelope were stalked by hunters wearing antelope skin disguises or mounted on horseback. Elk, mountain sheep, and deer were also important resources.

Historically, ranching has been an important part of Euro-American settlement in the region since the mid-1800s. Ranching and cattle grazing has dramatically affected the landscape and resulted in the replacement of grasses by sagebrush in much of this region. Prior to European settlement in the area, grasses were sufficiently abundant to have supported buffalo, which were hunted in the Lemhi Valley and upper Snake River plains until about 1840.

Basque men were particularly drawn to work as sheepherders in southwestern Idaho and northern Nevada beginning in the last two decades of the 19th century. Basque immigration to the region peaked from the 1900s to 1920s. During this time, gold and silver mining exploded in the region, and remains of these mining towns dot the landscape.

Historical Resources

In Idaho, commercial and government fish culture emerged concurrently in the early twentieth century. As early as 1894, federal surveyors in Idaho found evidence that the numbers of salmon and trout were decreasing (Evermann 1896, 15:253–84). Government projects typically focused on restoring diminishing runs with huge numbers of eggs and fry rather than examining causes and simply producing more fish (Northwest Power and Conservation Council n.d.). Despite the money spent on funding state and federal hatcheries, early twentieth-century studies could not definitively prove the success of artificial propagation efforts.

The early history of commercial fish culture in Idaho is not as well documented as government operations, but one source records that the first commercial fish farm in the state was built in 1909 at Devil's Corral Spring near Shoshone Falls in Jerome County (Klontz and King 1974, p. 53). Private fish farmers in Idaho were initially not closely regulated or professionally organized. Early commercial hatcheries in Idaho focused on trout. The basic technology and methods of trout farming changed little during the twentieth century. Early rearing-pond designs typically utilized existing natural features, either ponds or impoundments with controlled water flow. Later, as greater importance was placed on longer retention times and more controlled environments, hatcheries developed concrete raceway systems. Eventually, raceway design became somewhat standardized in terms of rectangular layouts, material, and proportions, but use of irregular earthen ponds for rearing continued. Most non-recirculating raceway systems required relatively high volumes of water, which made them a distinctive feature of North American hatcheries (as compared with European hatcheries from the same era). Locations with more limited sources of water used ponds or recirculating systems (Klontz and King 1974, p. 53).

The commercial trout industry experienced a significant boom in the early 1970s. Between the 1930s and mid-1960s, the production of commercial farms in Idaho ranged from about 0.5 to 3.0 million pounds annually; between 1970 and 1972, that number increased from 6.5 to 12 to 23 million pounds (Parker 2002, p. 15; Klontz and King 1974, p. 56). Most growth occurred in the processed-fish segment, which built plants for dressing, freezing, or canning. One of the earliest companies to invest in a processing facility was the Idaho Trout Company near Buhl. Another Buhl facility, owned by the Clear Springs Trout Company, was the world's largest in trout production in 2002 (Idaho Trout Company 2001, p. 15). Increased demand combined with the development of dry feed pellets and automated systems contributed to the period of industry growth (Parker 2002, p. 15).

The proposed Springfield Hatchery site is located on land settled by homesteaders in the late nineteenth century. Hanson Garletz and his wife, Florence; Ransom Harris; and George Ward owned parts of the property that now comprises the Springfield Hatchery site. The several springs, creeks, and sloughs in the area made it well suited for trout farming (U.S. Department of the Interior, Bureau of Land Management n.d.). A variety of factors contributed to population growth in late nineteenth-century Idaho, including the Desert Claim Act of 1877, followed by the Carey Act of 1894, which provided incentives for irrigating and cultivating portions of land. Additionally, the arrival of the railroad between 1880 and 1892 resulted in a boom in settlement in the areas near the rail lines.

In 1938, Robert I. Houghland purchased a portion of the original Garletz property. Houghland had come west from Indiana as a child with his mother and father, who was an agent with the Oregon Short Line Railroad (U.S. Bureau of the Census 1920, p. 4). Robert and his wife, Dorothy, established Houghland Farms, Inc. (Houghland Farms), which was later managed by their son, R. Porter Houghland (*Today's News-Herald* 2007, p. 6A).

Whether a hatchery was present when the Houghlands took over the land is unknown, but in 1945 Houghland Farms established a 50-cubic-feet-per-second (cfs) water right for "fish propagation" (Idaho Department of Water Resources 2012). An aerial photograph from 1946 shows that a spring-fed creek was bermed to form an impoundment (currently known as Crystal Springs Pond) with two outlets to thin channel improvements to the west and south in addition to the natural creek path. The impoundment may have provided both a means to control a steady source and flow of water and a holding pond for fish rearing. Although no structures are evident at this time, given the extent and character of the improvements to the water system in the area, a fish farm of some sort was most likely operating on the Houghland property prior to 1946.

In 1947, Morris Davis and Ralph Nelson, two experienced commercial fish farmers, leased spring-water rights and land from Houghland Farms to establish the Crystal Springs Trout Farm.

Little development took place between 1946 and 1969—no structures are evident in the vicinity of Crystal Springs Pond, and the primary fish culture operations appeared concentrated to the southwest. The next two years brought significant new developments, including the two rectangular raceways, and by 1971, the site manager's residence and hatchery building had been built. John Houghland, Porter's son, confirmed that the hatchery building and raceways were built around 1969 or 1970, during the years when the commercial trout markets began to experience substantial growth (Houghland pers. comm.). Klontz and King noted that Porter

Houghland managed the fish farm at some point prior to 1973 when Clear Springs Trout Company leased the facility for maintaining brood stock and producing market-sized fish (Klontz and King 1974, p. 54).

When Klontz and King conducted their survey in 1974, they described the former Crystal Springs Trout Farm (at this date, under the management of Clear Springs Trout Company) in terms of three interconnected farm areas, with the Farm 2 section encompassing the proposed project area. At that time, the hatchery building, main raceways, a secondary holding area, and manager's house were present. The concrete portions of the main raceways extended only about $^2/_3$ of the current length, and neither the extension to the hatchery building nor the shed had been added yet. A small rectangular holding pond or raceway constructed of unknown material was shown approximately 75 feet north of the main raceways.

The other components of the Crystal Springs Trout Farm—Farm 1 and Farm 3—were strung along a series of ponds, connecting streams, and raceways to the south. Early references to a fish hatchery may have referred to the area around Farm 1 rather than the project site at Farm 2. In aggregate land area, the three farm areas comprised one of the larger trout farms in Idaho in the early 1970s (Klontz and King 1974, plate 3, p. 54).

In 1989, Houghland Farms sold the portion of the property where Farm 2 was located to Roger and Sybil Ferguson. The Fergusons had started Diet Center, Inc., which had originally begun as a local nutritional guidance program but later developed a nationwide presence with diet center facilities and franchises. The Fergusons purchased the former Crystal Spring Trout Farm and built a cannery in 1988 for a dedicated supply of fish for their diet centers (*Lewiston Morning Tribune* 1988, p. 2C). Western Star Farms acquired the property, now identified as Tax Parcel T9606, in 1996 and sold it two years later to North Fork Energy. North Fork Energy gifted the property to the Idaho Fish and Wildlife Foundation in 2005, which in turn formally transferred ownership to IDFG in 2010 as part of a larger plan to increase the sockeye salmon population in Idaho (Idaho Land Appraisal n.d., p. 13).

Several changes have been made to the site since 1971, including the addition of office space to the hatchery building, the construction of the shop, and the extension and refurbishment of the main concrete raceways. In the late 1980s, when the trout farm changed its purpose from maintaining a brood stock for egg production to raising market-sized fish for the cannery, a cover over the raceways was removed. Between 1998 and 2005, North Fork Energy drilled 10 wells on the property to increase flow to the pond and hatchery, which had been diminishing since the mid-1980s. Neither the cannery nor the fish farm has operated for several years (Idaho Land Appraisal n.d., p. 14).

3.10.2 Environmental Consequences—Proposed Action

BPA conducted research and field surveys to identify the presence of cultural materials that could be affected by the Proposed Action. Under the Proposed Action, the existing residence at the Crystal Springs Hatchery, concrete raceways, and a small shop would be demolished; several new facilities, including a hatchery building, new raceways, and three residences, would be constructed. Improvements would also be made to the existing well system.

To determine how the Proposed Action would affect cultural resources, if present, cultural resources staff at BPA conducted background research and a pedestrian survey of all areas where ground-disturbing activities would take place at the Springfield Hatchery study area (Scheidt 2011). The outstocking areas were not included in the pedestrian survey because the activities, such as the fish release proposed for these locations, are not the type that would typically affect cultural resources.

Background research revealed that the prehistory of the southern Idaho region is not well documented. Most known archaeological sites are found either in caves or rock shelters or along river bottoms where winter camps would be established close to resources. Historic sites relate mainly to early European settlement in the area and consist of historic building and structures and equipment related to ranching and farming. Because the Proposed Action would take place within an area that was used historically for agriculture, it is more likely that resources related to ranching and farming would be present within the study area.

Background research revealed that a total of four cultural resources surveys have been conducted within 1 mile of the hatchery site, and two historic archaeological sites were identified close to the hatchery site. One of these sites, the Union Pacific Railroad, runs approximately 1 mile to the north. The railroad was constructed as part of the Pacific Railroad Act of 1862, signed by President Lincoln, which called for the creation of a large-scale railroad system throughout the United States.

The second site is a segment of Goodale's Cutoff that runs to the west of the hatchery site. This cutoff was an alternate route of the Oregon Trail that led emigrants from Fort Hall to Fort Boise. Although the main route of the Oregon Trail followed the course of the Snake River, Goodale's Cutoff traced traditional Shoshone migration routes. It was created in hopes that this alternate trail would enable emigrants to reach the Salmon River gold fields more directly (National Park Service 2011). Although the cutoff was used between 1852 and 1854, it was not until 1862 that the cutoff saw heavy use. During this time, tensions between Northern Shoshone and Bannock tribes and settlers rose, and following the Massacre Rock ambush of 1863, nearly seven out of 10 wagons chose Goodale's Cutoff instead of the main Oregon Trail (National Park Service 2011). Neither of these sites is located within the study area and, therefore, would not be affected by the Proposed Action.

During the course of this field survey, one potentially historic structure was identified: the ~~existing~~ Crystal Springs Hatchery facility and raceways. At the time of the survey, ~~L~~little information ~~is~~ was readily available about the Crystal Springs Hatchery; however, it has had been rumored to have been one of the largest privately owned hatcheries in the west. ~~The original structures was~~ Based on discussions with the current hatchery manager, it was initially thought that the original hatchery and concrete raceways were built in 1950 by a private landowner and were in use until the mid-1980s (Figure 3.10-1).

Figure 3.10-1. View of the Existing Hatchery Building to the North

Further analysis was undertaken to confirm the age of the structures present and to provide an historical context for the hatchery. This research revealed that the hatchery building and concrete raceways were constructed sometime between 1969 and 1971, with further modifications taking place between 1971 and 1985. The current condition of the facilities is poor, particularly the raceways at the southern end of the property (Figure 3.10-2), suggesting that it has not been used as an operating facility for many years. Minimal maintenance activities and upgrades have taken place since its original construction. As a result, the facility is run-down.

Because of the age of the hatchery, these structures do not meet the 50-year age threshold for listing in the NRHP, nor do they appear to rise to the level of exceptional significance to qualify for inclusion under any of the NRHP criteria considerations for properties younger than 50 years of age. The State Historic Preservation Officer concurred with this finding in a letter submitted to BPA on April 19, 2012 (Pengilly pers. comm.). this structure could be eligible for nomination to the NRHP. However, the hatchery site is not recommended as eligible for listing because it does not possess integrity. Therefore, it they is are not considered a historic property under the NHPA.

Figure 3.10-2: View of the Existing Raceways to the North

3.10.3. Mitigation—Proposed Action

~~Although one historic structure was identified within the study area, it has been determined ineligible for listing in the NRHP. However,~~ Because low potential remains to disturb unknown cultural resources accidentally, IDFG would implement the following mitigation measure to avoid or minimize impacts of the Proposed Action on cultural resources:

- Use appropriate BMPs ~~to minimize impacts~~, including the preparation and use of an Inadvertent Discovery Plan, which would establish procedures to deal with unanticipated discovery of cultural resources before and during construction, to minimize impacts. The plan, among other provisions, would require immediate work stoppage and appropriate notification in the event of the discovery of previously unknown cultural or historic materials.

Chapter 4—Environmental Consultation, Review, and Permit Requirements

4.3. WETLANDS AND FLOODPLAINS

As part of the NEPA review, U.S. Department of Energy NEPA ~~regulations~~ procedures require that impacts on floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental

Review Requirements (10 CFR 1022.12) and Executive Orders 11988 and 11990. Evaluation of impacts of the Proposed Action on floodplains and wetlands are discussed briefly below and in more detail in Section 3.6, Wetlands, and Section 3.7, Floodplains, of ~~this EA~~ the Preliminary EA.

Wetland and waterway management, regulation, and protection are addressed in several sections of the Clean Water Act, including Sections 401, 402, and 404. The various sections applicable to the Proposed Action are discussed below.

Section 401. A federal permit to conduct an activity that causes discharges into navigable waters is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. IDEQ would review the Proposed Action's Section ~~401~~ 402 and Section 404 permit applications for compliance with Idaho water quality standards and grant certification if the permits comply with these standards.

Section 402. This section authorizes NPDES permits for the discharge of pollutants, such as stormwater. The EPA, Region 10, has a general permit for federal facilities for discharges from construction activities. IDFG would issue a Notice of Intent to obtain coverage under this general permit, and is preparing a Stormwater Pollution Prevention Plan to address stabilization practices, structural practices, stormwater management, and other controls. Additionally, IDFG will seek an NPDES permit for hatchery effluent discharges (see Section 3.5, Water Quality and Water Quantity, of ~~this EA~~ the Preliminary EA).

Section 404. Authorization from the Corps is required in accordance with the provisions of Section 404 of the Clean Water Act when dredged or fill material is discharged into waters of the United States including wetlands. IDFG will coordinate with the Corps to obtain a Section 404 permit for any fill placed in wetlands and work with IDEQ to obtain Section 401 water quality certification (see Section 4.3). Potential impacts on wetlands are described in Section 3.6, Wetlands, of ~~this EA~~ the Preliminary EA.

References

The following references have been removed because they were either listed in duplicate or were not cited in the Preliminary EA. Additional references have been added based on new information provide in the Final EA and are presented at the end of this Revision Sheet.

~~Idaho Department of Environmental Quality, Shoshone Bannock Tribes, and Environmental Protection Agency. 2006. *American Falls Subbasin Assessment and Total Maximum Daily Load*. July.~~

~~Idaho Department of Fish and Game (IDFG). 2005a. *Idaho Comprehensive Wildlife Conservation Strategy*. Idaho Conservation Data Center, IDFG, Boise, ID. Available: <http://fishandgame.idaho.gov/public/wildlife/cwcs/>. Accessed: August 9, 2011.~~

~~Murphy, Robert F. and Yolanda Murphy. 1986. Northern Shoshone and Bannock. In Great Basin, edited by Warren L. D'Azevedo, pp. 284-307. Handbook of North American Indians, Vol. 11, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.~~

~~Idaho Department of Fish and Game. 2009. *Draft Snake River Sockeye Salmon Recovery Strategy*. Idaho. April.~~

~~Hatchery Scientific Review Group. 2009. Columbia River Hatchery Reform System-Wide Report. February~~

Appendix E—Adaptive Management Performance Indicators, Risks, and Measures Associated with the Snake River Sockeye Captive Broodstock Program

As indicated in the revisions to Chapter 2, Alternatives Description, research, monitoring, and evaluation of the ongoing Snake River Sockeye Captive Broodstock Program would continue with implementation of the Proposed Action. As noted above and in the response to comments, while the Proposed Action specifically would not include outstocking of smolts at Alturas Lake, outstocking in this location would be considered with implementation of a final recovery plan. Therefore, reference to Alturas Lake has been left in the tables presented in Appendix E.

Table 1. Performance Indicators Addressing Risks Associated with the Current Program

Performance Standard	Performance Indicator	Monitoring and Evaluation
3.5 – Genetic Characteristics		
3.5.1: Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.	Founder genetic profiles known and compared to genetic profiles developed each successive generation.	Intensive annual genetic monitoring of captive and anadromous contributors (determined by measuring heterozygosity and allelic diversity within the population and through gene dropping analysis).
3.5.2: Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.	Patterns of genetic variation do not change significantly as a result of artificial population.	Intensive annual genetic monitoring of captive and anadromous contributors (determined by measuring heterozygosity and allelic diversity and relative reproductive success).
3.5.3: Artificially produced origin adults in natural production areas do not exceed appropriate proportion of the total natural spawning populations.	Captive broodstock program initiated to preserve and augment natural spawning population.	Annual production of listed fish to natural environment (see annual reports and/or release tables).
3.5.4: Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.	Program currently lacks in-basin infrastructure to accommodate acclimation of all smolt release groups; balance of juvenile releases maximize homing.	Not applicable

Table 2. Performance Standards, Indicators, Benefits, Risks, and Proposed Monitoring and Evaluation for the Sockeye Program

Performance Standard	Indicator	Benefits and Risks	Monitoring and Evaluation Activities
Achieve Natural Spawner Abundance Targets	Triggers achieved	Program success is determined by the number of natural origin (NOR) adults on the spawning grounds. The higher this value, the more likely the population will be able to maintain itself over time. Triggers also are used to determine when hatchery origin (HOR) releases are reduced or eliminated, thereby decreasing risk of the program to the natural population.	Determined by monitoring adult escapement to Redfish, Pettit and Alturas lakes
Incorporate sufficient number of NOR adults into broodstock collection	Proportion of natural-origin fish in the hatchery brood (pNOB) of at least 20%	Achieving the pNOB standard (20%) ensures that the hatchery population does not diverge from the natural component.	The origin (hatchery or natural) of adult fish will be enumerated and classified using genetic analysis and marking information at weirs located on target streams. All natural-origin fish not used for broodstock will be released upstream of the weirs to spawn. Broodstock will consist of at least 20% NOR adults.

Performance Standard	Indicator	Benefits and Risks	Monitoring and Evaluation Activities
Adult run-timing (HOR and NOR)	HOR and NOR run-timing curves are similar over time	For integrated programs, the run-timing of hatchery and natural runs should match, as this is an indicator that the two populations are expressing similar life-histories, and that both are being exposed and adapting to the full range of environmental conditions present in the basin. A mismatch in run-timing between the two populations (HOR and NOR) indicates that hatchery practices are selecting for life-histories dissimilar to those being expressed by the natural population. The two populations may become more divergent over time resulting in greater genetic impacts to NOR populations from hatchery fish spawning in the natural environment. This could include a loss in productivity, diversity and spatial structure.	NOR and HOR run-timing data will be collected at weirs located at Redfish Lake and the Sawtooth Hatchery. Weir counting stations may be located at Alturas and Pettit lakes in later phases to better enumerate adult production and timing for these two systems.
Juvenile abundance over time in Pettit, Alturas and Redfish lakes	Increasing trend	Increasing juvenile abundance over time indicates that natural production levels and system productivity are improving.	Juvenile traps will be operated at the outlets of Redfish, Pettit and Alturas lakes. Trap operations and costs are covered by on-going monitoring efforts outside of the Master Plan.
Achieve ESA defined harvest rates on NOR adults	Variable	Managing the system to NOT exceed identified harvest levels maximizes the number of NOR adults returning to spawning areas.	In-season harvest rates are monitored as part of a regional efforts conducted by federal, state, and tribal entities

Performance Standard	Indicator	Benefits and Risks	Monitoring and Evaluation Activities
Achieve the Proportion of Hatchery-Origin Spawners (pHOS) targets	pHOS decreases over the three phases of the program	Limiting the proportion of hatchery fish on the spawning grounds (pHOS) reduces possible genetic impacts to the natural population. The more dissimilar the two populations, the larger the risk hatchery strays pose. In a well-integrated program, the proportion of natural-origin fish in the hatchery brood (pNOB) must exceed the proportion of hatchery fish on the spawning grounds (pHOS). This is to ensure that the populations possess similar genetic and phenotypic traits.	Weir counts and spawning carcass surveys will be used to determine/manage pHOS.
Proportionate Natural Influence (PNI)	> 0.67 (Phase 3)	Achieving the PNI goal >0.67 ensures that the natural, rather than the hatchery environment, is driving local adaptation. Fish better adapted to the natural environment are more productive and more resilient to environmental change. Low PNI (<0.50) is an indicator that the hatchery environment is driving local adaptation. Fish adapted to this environment are less likely to perform well in the wild and therefore reduce the productivity and diversity of the natural component of the combined population.	Natural escapement rates of HOR and NOR will be monitored and controlled both at the hatchery and the spawning grounds. Natural escapement HOR/NOR ratios will be achieved by operating adult weirs at Redfish Lake and Sawtooth Hatchery. Intensive annual genetic monitoring of captive and anadromous contributors to be performed at Eagle Fish Genetics Laboratory.

Performance Standard	Indicator	Benefits and Risks	Monitoring and Evaluation Activities
Reproductive success of naturally spawning HOR and NOR adults	HOR adult recruits per spawner > NOR adult recruits per spawner	Having HOR recruit per spawner (R/S) values > NOR indicates that the program is producing fish adapted to the natural environment as these HOR spawners produce as many returning adults as their NOR counterparts.	Genetic analysis (e.g., pedigree) will be used to determine reproductive success of various hatchery release strategies and the natural population
Straying of program fish to other subbasins or areas	< 5% other subbasins or areas	Good homing fidelity of HOR fish to the hatchery or targeted areas is important for eliminating the genetic risks hatchery fish pose to wild fish from interbreeding. The higher the homing fidelity, the lower the risk. High homing rates also ensure that broodstock are available for culture so that wild populations do not need to be excessively used to achieve production targets.	Regional monitoring and evaluation efforts used to track stray rates out-of-subbasin stray rates

Public/Agency Comments and Responses

This section presents comments received on the Preliminary EA and BPA's responses to these comments. Comments were submitted in writing through letters and email as well as by calling BPA's comment telephone line. A total of five substantive comment submittals were received. Each comment submittal was given an identifying number that corresponds to the order in which the submittal was logged in to the official BPA comment file. Comment submittals were received from the following individuals, organizations, and agencies:

SHEA 0001 – Bahlul Selalu Pegatan
SHEA 0002 – Gerald
SHEA 0004 – Kitty E. Griswold, PhD/Trout Unlimited
SHEA 0005 – Helen Neville, PhD
SHEA 0006 – Scott Levy/bluefish.org

Breaks in the number sequence reflect blank or erroneous submittals and submittals that did not include comments or did not have content applicable to the Rebuild Project (such as SPAM, including advertisements and nonsensical number and letter sequences).

Each comment submittal is reproduced in its entirety in this chapter. Where a comment submittal included multiple comments, each of these comments was assigned a sequential number. Following each comment submittal are BPA's responses to the comments raised in the submittal.

SHEA 0001
Bahlul SELALU PEGATAN

Thanks for his information, I am very happy with this website. I will continue to come back here to read the latest update of this website, once again I say thanks a lot.

Response to Comment SHEA 0001

Thank you for your comment.

SHEA 0002
Gerald

I fully support this effort. My only worry is that if the river is populated too fast that it will be harmful for other species, possible endangering them. Please be careful.

Response to Comment SHEA 0002

Concerning the number of juvenile and/or adult Snake River sockeye salmon (*Oncorhynchus nerka*) in the Stanley Basin, please note that the Springfield Hatchery is anticipated to produce up to 1 million full-term smolts that will be released to basin waters as part of the Proposed Action. During the smolt phase of development, juvenile fish quickly emigrate from nursery lakes and travel down the Salmon, Snake and Columbia rivers towards the Pacific Ocean. Production of approximately 1 million smolts would more closely represent historical production in the Stanley Basin and could result in approximately 10,000 to 20,000 adults returning annually.

Consistent with efforts from 1991 to present, the ongoing monitoring and evaluation program is intended to identify potential changes within the ecosystem (changes in fish growth, numbers, survival, predator population interactions, etc.). As indicated in the revisions to Chapter 2, Alternatives Description, the Program cooperators, including IDFG and NOAA Fisheries, would continue to manage the Program adaptively under the Proposed Action using these data. These activities include those identified in the draft HGMP (Appendix A of the Springfield Sockeye Hatchery Master Plan) and decision triggers and decision rules based on natural- and hatchery-origin adult returns to the basin. Collectively, information from these programs would be used to manage the Program adaptively on a yearly basis. Relevant performance standards, risks, and proposed adaptive management monitoring activities are summarized in Appendix E of this EA. Additional information regarding the proposed recovery/adaptive management can be found in Appendices A and C (p.1-8) of Volume 2 of the Springfield Sockeye Hatchery Master Plan (Idaho Department of Fish and Game 2010).

Emphasis on the words "adaptive management" is important because Program cooperators continue to learn new information about Stanley Basin populations each year. Since issuance of the Preliminary EA, new information has been gained about the native *Oncorhynchus nerka* population found within Alturas Lake. Because BPA and IDFG support the need for biodiversity in all populations, the use of Alturas Lake as an outlet for Snake River sockeye salmon recovery will be delayed (pending a formal recovery plan) to protect the diversity that is represented within this unique lake. Therefore, it is no longer being considered as part of the Proposed Action.

Sockeye salmon smolts would share habitat with other salmonids in the Salmon, Snake, and Columbia rivers during their migration to the Pacific Ocean. All of the species present in these systems evolved in coexistence and generally in much higher numbers than those currently found or that would be found during operation of the project. Therefore, competition for space and prey is not expected to affect any of these species adversely.

As discussed on page 3-49 of the Preliminary EA, there is limited potential for increased numbers of sockeye salmon to affect bull trout (*Salvelinus confluentus*) adversely, a species that is federally listed as threatened under the ESA. For example, sockeye salmon smolts eat primarily plankton, while bull trout eat a variety of invertebrates, with increasing numbers of other fish as they grow larger. Therefore, there would minimal competition between bull trout and sockeye salmon. In addition, PIT-tagged sockeye salmon smolts have been tracked from their release site to the Lower Granite Dam in less than 20 days. Given this rapid rate of movement through the system, there would be even less opportunity for interspecies competition.

Indirect effects of the Proposed Action on bull trout would include an increase in the potential prey base downstream of the smolt release locations. Bull trout may prey on sockeye salmon smolts as they migrate downstream, which would be a beneficial effect on bull trout. A study of predation in Redfish and Alturas lakes conducted in 1993 indicated that the stomach contents of bull trout from these lakes contained 89% sockeye salmon or kokanee (*O. nerka*) (Bonneville Power Administration 1995). Presumably, bull trout downstream of the smolt releases would prey on some of the smolts released, benefitting from the increased sockeye salmon outmigration resulting from the Proposed Action. Moreover, returning adult salmon would also incrementally add to the nutrient budget of the lakes and streams. These would both be beneficial impacts on bull trout.

SHEA 0004 – Kitty E. Griswold
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To whom it may concern,

I am providing comments as a citizen and scientist on the Preliminary Environmental Assessment (PEA) for the Idaho Department of Fish and Game's Springfield Sockeye Hatchery Plan, funded by Bonneville Power Administration (BPA). The proposed action is to expand an existing hatchery facility near Springfield, Idaho that would allow for increased broodstock production of the endangered Snake River sockeye salmon *(Oncorhynchus nerlca)*. If implemented, the Springfield Hatchery will produce up to I million sockeye salmon smolt that will be released in lakes and outflows of the Upper Salmon River Basin, Idaho, including three Sawtooth Valley lake. It is expected that this would "flood" the system with sockeye salmon in numbers that mitigate fish losses from the Federal Columbia River Power System, eventually leading to self-sustaining popu1ations. The plan is very ambitious but lacks clarity, omits some important details, and does not adequately address uncertainty and risk. These risks can have negative effects on existing populations of sockeye salmon in the system and could hinder further recovery of this important ESU. Unfortunately, BPA failed to acknowledge and address these issues in their PEA.

Based on the PEA and supporting documents, the expanded hatchery project appears to be the primary tool for the recovery of the Snake River sockeye salmon ESU. A recovery plan has not been developed for these fish since their listing in 1991, so there is no broad-scale; approach for restoration based on viable salmon population parameters (McElhany et al. 2000). **0004-1** Relying on hatchery-based recovery alone may have long-term consequences for this ESU for two reasons. *First,* it is unclear how recovery can be achieved without examining the fundamental issues of decline, such as low survival in the Snake and Columbia River system. **0004-2** Second, using hatcheries as a recovery tool has been identified as having inherent risks that can impair recovery and natural production (Buhle et al. 2009, Chilcote ct al 2011). **0004-3**

The PEA does not adequately capture the complex ecology of the Sawtooth Valley lakes, and therefore does not adequately capture the potential risks of increased hatchery production to the system. For example, the lakes support a number of populations of O. *nerka* with different life histories, such as kokanee from Alturas and Stanley Lakes and residual sockeye salmon from Redfish Lake. These fish appear to represent the unique and ancient lineage of *O.nerka* that is native to the Sawtooth Valley lake system (Waples et al. 2011), and they play an important ecological role. For example, residual sockeye salmon produce outmigrants and adult returns (Bjornn et al. 1968, Waples et aI. 2011). Adult sockeye salmon that are characterized by early run timing and origins to Alturas Lake were observed by Bjornn et al. (1968) and were recently documented, although until 2011 their return to the lake was barred by **0004-4** the Sawtooth Fish Hatchery weir. The presence of these ecologically resilient life history forms their continued contribution to adult sockeye salmon returns should be acknowledged, and potential risks to These populations should be thoroughly evaluated under the proposed action. Recovery actions should be based on maintaining life history and genetic diversity of the extant stock within the ESU (McElhany et al. 2000), and not impose risks to these stocks to increase abundance in the short-term. Risks to extant life history forms impose risks to long-term persistence under future scenarios that include climate change, changes in ocean conditions, and continued stress on the river environments. 0004-4 cont'd.

It is important that any plan to increase numbers of locally adapted salmon stocks should be critically evaluated to ensure the actions do not impede the potential success of naturally produced fish, which most likely have already developed locally adapted traits (McElhany et al.2000). In the Sawtooth Valley lakes, naturally-produced *O. nerka* derive from kokanee and residual sockeye salmon (mentioned above) and those produced from various release strategies under the current management strategy in the lakes. These fish not only contribute adult returns, as mention above, but the smolt-to-adult survival rates of these fish are higher than their hatchery-produced counterparts. Naturally-produced adults appear to approach or exceed 1:1 replacement levels which are required for self-sustaining populations and viability (IDFG, Springfield Master Plan, 2010). For reasons that are not clear, the PEA does not address the potential risks to these fish or acknowledge their potential role in recovery. 0004-5

While hatcheries are commonly used in salmon restoration programs, the effectiveness of this approach is controversial. For example, genetic risks to captive-bred populations of salmonids and their wild counterparts have been documented (Akari et al. 2007, Chilcote et al 2011). The PEA acknowledges some of these risks, noting that they will be addressed in a Hatchery Genetics Management Plan that will be developed in the future, and as such the impact of the proposed action was determined to be "low". Given the weight of evidence regarding the risks of hatcheries it seems that the burden of proof should be on the agencies and those that fund them to demonstrate that this important issue is addressed early in the process. Evaluating the potential impact as "low" based on a future action does not seem prudent or risk-averse. 0004-6

The ecological effects (namely competition and density dependence) of introducing up to 1 million smolts to the lake and river environments are not adequately addressed in the PEA. A more careful review would addresses the potential impacts to the naturally-produced *O. nerka* that rear (and undergo density dependent boom bust population cycles) in the oligotrophic nursery lakes. 0004-7

BPA evaluates the risk of not implementing the proposed action (i.e. expanding hatchery production) as "low", and state that "sockeye salmon recovery could be slower under the No Action Alternative because supplementation of existing populations would occur at current levels". Slower recovery under the current scenario does not justify the risk and uncertainty of the proposed action, particularly given the recent increase in numbers of adult returns and naturally produced fish (Columbia Basin Bulletin, September 30, 2011). 00004-8

Finally, it is proposed that increasing sockeye salmon abundance in the short-term through hatchery supplementation will, in the long-run, produce locally-adapted self-sustaining stocks. In theory, these fish will have higher smolt-to-adult survival rates than those currently observed (barring fitness issues such as those observed by Christie et al. 2011). The success of the proposed project is based on the ability to establish populations that reach replacement levels through higher survival rates. If higher 00004-9 survival rates are not achieved, the propose hatchery and expanded smolt production does not further the process of recovery of Snake River Sockeye salmon. The program would incur the risks detailed in the previous paragraphs, and it is likely that hatchery supplementation would be needed to maintain abundance in the long term. **0004-9 cont'd.**

Alternatively, if replacement levels can be met, recovery can be achieved, albeit over a longer period of time, without the expanded smolt production by using the current captive broodstock approach and focusing on improving conditions for naturally-produced fish. I urge BPA to better evaluate the risks and uncertainty of a hatchery-based recovery program for Snake River sockeye salmon before they approve further actions.

Response to Comment SHEA 0004-1

During the past 20 years, the captive broodstock components of the Program have been the primary means to propagate the population because there were virtually no wild anadromous sockeye salmon remaining in the population at the time of listing (a small ***residual***[7] component existed within Redfish Lake). As indicated in the revisions to Chapter 2, Alternatives Description, the Program cooperators acknowledge that the Program has been operating since 1991 without a federal recovery plan in place. Even without such a document, the Program has continued to move forward with collaboration of scientists from state, federal, and tribal entities to help guide maintenance and recovery efforts.

The goal under the NPCC's Fish and Wildlife program as implemented by BPA is to protect, mitigate, and enhance fish and wildlife. Consistent with this goal, BPA is considering implementation of the Proposed Action to fund the Springfield Hatchery. As indicated in the Springfield Sockeye Hatchery Master Plan, the goal of the Program is to achieve a self-sustaining natural Snake River Sockeye salmon population to support delisting under the ESA (Idaho Department of Fish and Game 2010).

To be eligible for ESA-delisting, sockeye salmon numbers need to reach levels that meet NOAA Fisheries interim recovery criteria. For Snake River sockeye salmon, 1,000 sockeye salmon must be produced in Redfish Lake as well as 500 each in two additional lakes (National Oceanic and Atmospheric Administration 1995). To achieve NOAA Fisheries' recovery criteria, IDFG developed the Springfield Sockeye Hatchery Master Plan, which is a three-phased recovery plan to serve as an interim adaptive management plan and guidance document for future recovery actions. IDFG designed the Springfield Sockeye Hatchery Master Plan to achieve the escapement target of 500 adult fish in Pettit Lake and, eventually, Alturas Lake. The Proposed Action would contribute to ESA delisting and species recovery because operation of the Springfield Hatchery would result in the ability to produce 500,000 to 1 million smolts, which in turn would be likely to increase adult returns, thereby allowing more sockeye salmon to be produced in Redfish and Pettit lakes. By increasing the sockeye salmon population in these lakes, there is a greater likelihood that NOAA Fisheries' interim and anticipated final recovery criteria can be met, and Snake River sockeye salmon can be delisted under the ESA.

Response to Comment SHEA 0004-2

BPA is not relying solely on hatchery-based efforts under the Proposed Action to mitigate and conserve Snake River sockeye salmon. BPA has incurred over $11 billion in mitigation costs since 1978, over $800 million last year alone (Northwest Power and Conservation Council 2011). With these funds, BPA has worked to improve water quality, increase water quantity, reduce losses from avian and marine mammal predation in the Columbia River migration corridor, and reconfigure Columbia and Snake River dams and their operations to pass both adults and juvenile salmon more safely. In addition, BPA has funded efforts to improve tributary spawning and rearing habitat, including in particular the habitat used by Snake River sockeye salmon in the Stanley Basin. The direct benefits of these efforts for Snake River sockeye salmon prove difficult to quantify because of the relatively small sample size. Additional actions completed in 2010 that have aided in sockeye salmon conservation include the following:

[7] Residual – some portion of released fish may not migrate to the ocean and live their lives in freshwater.

- FCRPS managers evaluated long-term system survival performance for five fish stocks, including sockeye salmon, using a 5-year rolling average of annual system survival estimates. Snake River fish stocks were used as surrogates for Snake River sockeye salmon and mid-Columbia steelhead. Several factors that most likely affect the attainment of adult performance standards were addressed (e.g., modifications to operations and structures at dams designed to increase juvenile survival, which may increase fallback and delay adults; losses due to sea lion predation; additional levels of straying and harvest-related mortality not addressed using current methodology). Each of these potential factors were assessed through the 2008 FCRPS Biological Opinion Research, Monitoring and Evaluation actions (Federal Columbia River Power System Action Agencies 2010). In 2010, Snake River fall Chinook and upper Columbia River steelhead surpassed the performance standard.

- Juvenile sockeye salmon from Idaho were PIT tagged and used to evaluate the feasibility of transport from Lower Granite Dam.

- A study to evaluate the effects of bypass on adult return rates of Snake River Basin hatchery fish was funded by the U.S. Army Corps of Engineers in 2010, and an associated regional workshop was held in September 2010.

- A PIT tag study to evaluate weekly smolt-to-adult returns for natural spring Chinook and steelhead transported from Lower Granite Dam continued in 2010.

- Design and installation criteria were developed as a part of the evaluation of the feasibility of installing spillway PIT detectors at FCRPS dams.

- Juvenile fish descaling rates at two different turbine operating levels at McNary Dam were evaluated to help optimize turbine operations and improve fish survival.

- Survival estimates at Bonneville, The Dalles, and John Day dams suggest that the levels are high enough to attain the performance standards required under the FCRPS Biological Opinion.

- A study to evaluate at The Dalles Dam after installation of the spill wall showed juvenile fish survival improved significantly (3% to 4%) (Federal Columbia River Power System Action Agencies 2010).

Fortunately, multiple habitat and migration corridor improvements, along with favorable ocean conditions, have increased survival of both juveniles and adults returning to the Snake River Basin. For example, data collected as part of the extensive monitoring and evaluation program associated with the Program have identified smolt to adult returns (SARs) that are similar to data collected in the 1950s and 1960s (Bjornn et al. 1968), prior to the development of the Lower Snake River hydro projects. It is important to note that the 2.4% SAR observed in the Brood Year 2006 natural production group (products of captive adult releases spawning naturally within Redfish Lake) is at ***replacement***[8] for this population; this would indicate that recovery of this

[8] Replacement – the rate with which an individual replaces itself through reproduction. To be at replacement indicates a self-sustaining population has been reached.

population is possible with the current conditions found within the system. In addition, Program cooperators are also conducting research specific to identifying survival issues within the migration corridor. Current and future research, along with existing monitoring and evaluation studies (research and genetics), will remain a fundamental and integral part of the Program into the future.

Response to Comment SHEA 0004-3

Chilcote et al. (2011) indicated that there was a negative relationship between the reproductive performance of natural populations of steelhead, coho, and Chinook salmon and the proportion of ***integrated***[9] and segregated hatchery fish used to supplement the wild population. The authors go on to state that the benefits of any ***supplementation***[10] activity should outweigh reduced reproductive performance.

The Program was implemented in 1991 as a means to safeguard the population from extinction. During the past 20 years, the captive component has been the only means to propagate the population because there were virtually no wild fish left in the population at the time of listing (a small residual component most likely existed within Redfish Lake). The Program has an extensive genetic component that used recommended spawning practices (factorial mating, inbreeding avoidance matrices) and monitored genetic diversity to ensure that significant losses or changes in diversity would not occur over time. The genetic and research, monitoring, and evaluation components have been thoroughly scrutinized and critically evaluated by scientists at each step of the review process, including review by the NPCC and BPA as well as the NPCC's ISRP. Program cooperators have successfully retained approximately 90% of the founding diversity and kept inbreeding at modest levels.

At this point, the Program is neither an integrated nor a supplementation program. BPA and IDFG believe that the benefits of reducing the extinction risk and maximizing the number of fish in the basin outweighs and overrides any negative effects of reduced hatchery performance in the wild. The HSRG reviewed the Snake River sockeye salmon ESU and determined "[w]ithout the boost provided by the hatchery program, this population likely would be extinct." The HSRG also concluded "[t]he initial priority for this program should be to transition away from a captive brood program to one reliant upon natural returns…..The overarching goal for implementing any or all of the above strategies is to return more anadromous adults that could be used selectively in spawning designs or released to the habitat to improve the fitness of this closed population" (Hatchery Science Review Group 2009).

The Springfield Sockeye Hatchery Master Plan provides a stepwise progression where monitoring and evaluation can guide adaptive management. Recent genetic analyses have shown that use of full-term smolts (released to migrate downstream) and full-term captive adults (released to spawn ***volitionally***[11]) have SAR rates that range from 0.8% to 2.4% (eight to 24 adults per 1,000 emigrating smolts, depending on strategy). In contrast, use of eyed-egg and

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[9] Integrated program – hatchery programs may be integrated or segregated. Integrated programs manage hatchery and wild fish as one gene pool. Segregated programs manage hatchery and wild fish as two separate gene pools.

[10] Supplementation – the release of hatchery fish to augment naturally occurring populations.

[11] Volitionally – of one's own choice.

pre-smolt release strategies yield far fewer returning adults per equivalent number of eggs/fish (three adults per 1,000); by using the proposed strategy of releasing up to 1 million smolts and then releasing the anadromous adults when they return, the Program cooperators employ the two best strategies for moving towards recovery of these fish.

This comment also touches on an important resource conservation policy issue: the role of artificial production in recovery efforts. To respond to that comment, a brief summary of the origins of this project becomes necessary.

To conserve sockeye salmon, IDFG and NOAA Fisheries initiated the Program in 1991. The first phase of the Program was the captive broodstock phase. Between 1991 and 1997, only 16 adult sockeye salmon returned to Redfish Lake. But by 2008, adult returns had increased significantly, so much so that by 2010 more than 2,200 adults returned to Lower Granite Dam and more than 1,500 returned in 2011 (Fish Passage Center 2012). NOAA Fisheries examined the reason for the increased returns and determined that "the large return of adults to the Snake River in 2008 was in part a result of increased smolt production in 2006" (National Oceanic and Atmospheric Administration Northwest Fisheries Science Center 2009).

The increased returns in recent years contrast to those just a few years earlier. In 2006, the ISRP considered the Snake River sockeye salmon "essentially extinct in the wild now" (Independent Scientific Review Panel 2006). The ISRP found "no scientific basis for continuing the [captive broodstock] program" (Independent Scientific Review Panel 2006). The ISRP expressed the concern that "[t]he greater the time these fish are dependent on support of 'artificial' propagation methods, the greater the genetic divergence from the original population and the lower the potential for producing a self-sustaining population" (Independent Scientific Review Panel 2006). Ultimately, the ISRP advised that the sockeye salmon project was "not fundable."

The NPCC disagreed. It considered the independent scientists' findings, but nevertheless recommended that BPA continue funding the Program. The NPCC explained that "[w]hether and when to continue with or call an end to the captive efforts to rescue the sockeye salmon is a policy and legal call that rests with the NPCC, the project sponsors, the affected states, the ESA regulatory agency (NOAA Fisheries), and BPA" (Northwest Power and Conservation Council 2006). The NPCC chairman explained that "sometimes you have to make high-risk investments in order to rescue an imperiled species. We need to exhaust every opportunity before changing the course we're on" (Karier 2006). BPA continued funding the Program.

BPA is not a fisheries management agency but rather a federal power marketing agency within the U.S. Department of Energy. Several statutes, such as the Northwest Power Act (Act), govern BPA. As indicated in the revisions to Chapter 1, Purpose of and Need for Proposed Action, among other things, this Act directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the FCRPS. To assist in accomplishing this, the Act requires BPA to fund fish and wildlife protection, mitigation, and enhancement actions "consistent with" the NPCC's Fish and Wildlife Program (16 USC Section 839b(h)(10)(A)). Under this program, the NPCC makes recommendations to BPA concerning which fish and wildlife projects to fund.

The most recent ISRP review of the Program vindicates the NPCC's recommendation and BPA's decision to continue funding the Program. In that review, the independent scientists concluded that "[t]he sockeye captive brood project has successfully prevented extirpation of the Red Fish Lake sockeye population. However, substantial improvements in survival are still needed before a natural population could be viable. The program needs to expand…." (Independent Scientific Review Panel 2011b). And despite earlier concerns about genetic inbreeding, the ISRP noted that "[e]vidence suggests that the current population contains over 90% of the genetic variation of its founders" (Independent Scientific Review Panel 2011).

Another group of independent scientists, the HSRG, also reviewed the Snake River sockeye salmon ESU. Similar to the ISRP, the HSRG is charged with independently reviewing hatcheries; however, HSRG reports directly to Congress instead of the NPCC. The HSRG recognized that without a hatchery program, Snake River sockeye salmon would most likely be extinct (Hatchery Science Review Group 2009). It also concurred with IDFG and NOAA's recommendation to increase smolt releases from 500,000 to 1 million fish because it would most likely increase adult returns that could be incorporated into the Program or released into the wild to increase natural production (Hatchery Science Review Group 2009).

Anticipating the success in the Program's first phase, IDFG proposed a second phase, which focuses on population recolonization in Redfish, Pettit, and Alturas lakes. NOAA Fisheries included the second phase as Reasonable and Prudent Alternative Measure 42 in the 2008 FCRPS Biological Opinion (Federal Columbia River Power System 2008). Because capacity issues at other facilities limited production, IDFG proposed to modify another existing hatchery for sockeye salmon recolonization, the Springfield Hatchery. The second phase of the Program, including construction of the Springfield Hatchery, is the Proposed Action that is analyzed in this EA. The Proposed Action is being considered because it is consistent with the NPCC's Fish and Wildlife program and the Program is in turn "based on sound science principles" (16 USC Section 839b(h)(10)(D)(iv)).

Response to Comment SHEA 0004-4

Currently, the Program has no evidence that any outside or unknown genetic contribution exists within Redfish or Pettit lakes. The observed populations within these lakes are a direct result of the hatchery release strategies used by the Program. The unmarked anadromous fish that return to the basin appear to have the same ***allelic***[12] diversity that is present within the captive broodstock. Genetic monitoring of the Program indicates that spawners in the Program represent the genetic diversity present within the ESU. As mentioned previously, the genetic and research monitoring and evaluation components of the Program have been thoroughly scrutinized and critically evaluated by scientists, including the NPCC, ISRP, and BPA, at each step of the review process.

The Program cooperators believe that it is important to protect native *O. nerka* and bio-complexity. Each of the three recovery lakes supports a number of different populations and life-histories.

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[12] Allelic – pertaining to an allele or one half of a gene or series of genes occupying a specific position on a chromosome. Refers to genetic diversity.

Pettit Lake currently contains a population of non-native kokanee and residual sockeye salmon. In the early 1960s, Pettit Lake received chemical treatments, and unfortunately, all native sockeye salmon populations were replaced with a non-native resident kokanee population. However, in the early 2000s, the Program released anadromous adults to volitionally spawn and, in some years, eyed-eggs in the egg box program. It appears that there may have been some ***residualization***[13] of Program fish within this lake. In Redfish Lake, three life-histories, including two genetically distinct populations of sockeye salmon and native resident kokanee are present. Residual populations are present at very low levels. Because the observed stocks of fish within Redfish and Pettit lakes are from the hatchery program, there are no perceived risks to adding additional hatchery fish from the Program to these lakes. The Program cooperators anticipate that the addition of Springfield Hatchery will help increase bio-complexity and further the development of locally adapted populations observed in these two lakes.

In Alturas Lake, a native kokanee population exists. As mentioned in the response to Comment SHEA 0002, since the development of the Preliminary EA, new information has become available about the native *O. nerka* population found within Alturas Lake. Because it is also important to protect bio-complexity, the use of Alturas Lake as an outlet for Snake River sockeye salmon recovery will be delayed until a federal recovery plan is produced to protect the diversity that is represented within this unique lake. However, under the Proposed Action, as documented within the Springfield Sockeye Hatchery Master Plan, a stepwise progression was outlined where monitoring and evaluation can guide adaptive management. Monitoring and evaluation will continue to identify the interactions of sockeye salmon, residual sockeye, and kokanee within the lakes, with the goal of increasing bio-complexity and rebuilding locally adapted populations of *O. nerka* within the basin.

Moreover, BPA understands that under NOAA Fisheries' most recent iteration of a policy on artificial propagation (70 Fed. Reg. 20734 [June 2005]), the artificially produced progeny of listed fish would be considered part of the listed species and protected under the ESA. A federal court found that policy violated the ESA and remanded it to NOAA Fisheries, which has not yet issued a revised policy (National Marine Fisheries Service 2012). Therefore, although not specifically designated in the 1991 listing, Snake River sockeye salmon produced in the captive broodstock program are the progeny of the last remaining wild sockeye. These fish show minimal inbreeding while retaining 90% of the founder genes. In other words, by law and in fact, today's Snake River sockeye salmon are a hatchery stock that has to date successfully avoided significant losses in diversity.

Response to Comment SHEA 0004-5

According to Program data and as discussed above in the response to Comment SHEA 0004-2, kokanee and residual sockeye salmon do not have higher SARs than their hatchery counterparts. Based on the current monitoring and evaluation data, the SARs for naturally produced adult returns (products of captive adult releases spawning naturally within Redfish Lake) have higher SARs than the rest of the release strategies. The natural adults (which are full-term hatchery adults released to volitionally spawn in the wild) have the highest SAR, at 2.4%, compared with

[13] Residualization – the phenomenon whereby anadromous fish remain within a river or lake and do not migrate to the ocean as juveniles or returning adults.

the Alturas Lake kokanee SARs, at 0.10%. It is difficult to quantify residual sockeye salmon SARs from Redfish Lake because the proportion of smolts from residuals versus hatchery adults is unknown. However, the number of fish in the anadromous return that could have arisen from a wild residual component was approximately 1% of the return (Idaho Department of Fish and Game, unpublished data).

The brood year 2006 naturally produced adult return SAR of 2.4% (as mentioned above) is at replacement for this population; this would indicate that recovery of these fish is possible with the current conditions found within the system. Neither BPA nor the Program cooperators currently have any data that suggest implementation of the Proposed Action would cause survival rates to decrease. Although there is some uncertainty regarding the population's ability to establish self-sustaining numbers, by using the proposed strategy of releasing up to 1 million smolts and releasing the anadromous adults when they return, Program cooperators employ the two best strategies for moving towards recovery of sockeye salmon. These two strategies increase the possibility of establishing a self-sustaining population and ultimately delisting this population. As mentioned earlier, data support that the release of smolts will most likely maintain or increase smolt survival when leaving the basin (***safety-in-numbers theory***[14]), and increased adult returns (released to spawn naturally within Redfish Lake initially) should maintain SARs, which are currently at replacement levels.

Under the Proposed Action, hatchery-produced smolts would be released within Redfish Lake Creek or within the Salmon River below the headwater rearing lakes. Current hatchery sockeye salmon PIT tag data have identified the average travel time from Stanley Basin to Lower Granite Dam for hatchery-produced smolts, which is between 9 to 15 days (Idaho Department of Fish and Game unpublished data). The speed required to travel to Lower Granite Dam in the timeframe above minimizes competition or density-dependence effects within the stream from smolt releases. For additional discussion on competition between hatchery-produced and native fish, please see the response to Comment SHEA 0004-7.

Response to Comment SHEA 0004-6

Both Araki et al. 2007 and Chilcote et al. 2011 indicate that adverse genetic effects may occur quickly within salmonid populations. Most of the genetic risks they identify, including negative reproductive performance, unintentional domestication selection, and relaxation of natural selection, have most likely already acted on this population. Fish currently within the system were brought into captivity in 1991. The Program is currently rearing the sixth generation of captively propagated sockeye salmon.

The Program is unique in that the remaining population exhibiting the complete genetic diversity is found only within the hatchery population. The Program has no evidence that any outside or unknown genetic contribution exists within Redfish or Pettit lakes. The unmarked anadromous fish that return to the basin appear to have the same allelic diversity that is present within the captive broodstock. Because the genetic diversity of non-hatchery fish appears to be the same as fish coming from the Program, there is very low risk of adversely affecting native populations. For this reason, risks of genetic contamination associated with the Proposed Action were identified to be low in the Preliminary EA.

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[14] Safety in numbers refers to the idea that more fish in the system would lead to higher rates of survival because individual fish receive protection from a larger number of fish within the overall population.

The Program has reached a critical juncture in the recovery of Snake River sockeye salmon and has identified that population expansion is an immediate need. A continuation of status quo (the No Action Alternative) for the captive broodstock hatchery population presents a risk of increased domestication and further loss of fitness in this closed population over time (Fraser 2008). Avoiding these risks is one of the most important reasons to implement the Proposed Action and develop the Springfield Hatchery. The Springfield Hatchery is vital to this strategy in that the Program cooperators currently cannot incorporate increased numbers of anadromous adults into the Program without reducing the effective population size. This is because of a lack of hatchery space to expand the Program. Use of the proposed Springfield Hatchery is a key element to increasing naturally spawning populations within Redfish Lake. Once a natural population has been successfully re-established, efforts will be expanded to include Pettit Lake, as described in the Springfield Sockeye Hatchery Master Plan.

In preparation of the Preliminary EA, BPA considered the alternatives proposed during the scoping and Preliminary EA review processes, the NPCC's recommendation, IDFG's Master Plan, the FCRPS Biological Opinion Reasonable and Prudent Alternatives, the ISRP's findings, and the HSRG's report. BPA also considered the evidence for the dramatic increase in adult sockeye returns in the last five years. Prior to 1993, wild natural production could not sustain the ESU. However, data from brood year 2006 indicates that the naturally produced adult return SAR of 2.4% (as mentioned above) is at replacement for this population. But NOAA Fisheries' Northwest Fisheries Science Center concluded that the main reason for the strong adult returns was not wild natural production. Instead, the NOAA Fisheries Northwest Fisheries Science Center indicated improved ocean conditions and increased hatchery production in recent years were the primary causes for the dramatic returns (National Marine Fisheries Service 2009). Historic trends for the Pacific Decadal Oscillation suggest it would be too optimistic to think that the returns seen in 2008, for instance, truly represent a fixed Columbia River environment, because ocean conditions are bound to return to normal or poor within a year or two after the La Niña dissipates (National Oceanic and Atmospheric Administration Northwest Fisheries Science Center 2012). Therefore, BPA hopes to increase the sockeye salmon population as quickly as prudently possible to help survive another downturn in ocean conditions. Consequently, for the reasons discussed in Chapter 2, Alternatives Description, of the EA and in these responses to comments, BPA believes it cannot rely on natural reproduction by wild fish at this time to meet the purposes and need for action discussed in this EA.

As discussed in the revisions to Chapter 2, Alternatives Description, although the HGMP is not final, a draft version has been submitted to NOAA Fisheries in November 2010 (Appendix A of the Springfield Hatchery Management Plan). As the Program starts to reestablish a naturally reproducing population, the genetic monitoring component as presented in the draft HGMP will increase to ensure genetic risks remain low. As indicated in the revisions to Chapter 2, Alternatives Description, and presented in Appendix E of this EA, IDFG has identified within the draft HGMP performance indicators that address the potential genetic risks of the Program. IDFG also proposes monitoring and evaluation protocols to ensure adverse risks are minimized. These measures are part of the ongoing research, evaluation, and monitoring activities associated with the Program and would continue to be implemented under the Proposed Action as described in the revisions to Chapter 2, Alternatives Description.

Response to Comment SHEA 0004-7

Under the Proposed Action, hatchery-produced smolts would be released within Redfish Lake Creek or within the Salmon River below the headwater rearing lakes. Current hatchery sockeye PIT tag data have identified the average travel time from Stanley Basin to Lower Granite Dam for hatchery-produced smolts, which is between 9 and 15 days (Idaho Department of Fish and Game unpublished data). The speed required to travel to Lower Granite Dam minimizes competition or density-dependence effects within the stream from smolt releases.

The Program has also identified that survival across all of the spread-the-risk release strategies (natural production, pre-smolt releases, eyed-egg releases) increases when smolt releases occur. Monitoring results show a corresponding increase in smolt-to-adult return rates as a result of smolt releases. This supports the theory that higher densities within the river environment lead to better survival (the safety-in-numbers concept; see response to Comment SHEA 0004-5). It appears that the size of the pulse or density of smolts during out-migration may be a successful strategy to avoid predation (Connell 2000). For these reasons, increased numbers of smolts within the system were not identified as a considerable adverse effect in the EA.

Response to Comment SHEA 0004-8

A continuation of the status quo (the No Action Alternative) for the captive broodstock hatchery population presents a risk of increased domestication and further loss of fitness in this closed population over time (Fraser 2008). To avoid increased genetic risks of domestication selection and to move forward with recovery of this stock, population expansion is an immediate need. Implementation of the Proposed Action and construction and operation of the Springfield Hatchery is vital to this strategy in that IDFG currently cannot incorporate increased numbers of anadromous adults into the program without reducing the effective population size. This is because of a lack of hatchery space to expand the Program. Use of the proposed Springfield Hatchery is a key element to increasing naturally-spawning populations within Redfish Lake. Once a natural population has been successfully re-established, efforts will be expanded to include Pettit Lake as described in the Springfield Sockeye Hatchery Master Plan.

The recent increase in numbers of adult returns and naturally produced fish are most likely a result of many favorable factors, such as good out-migration flows, favorable ocean conditions, and good adult return flow conditions. However, the available data support that much of the increases in numbers are attributed to the increase of smolt releases and the number of captive adults released into the lake to spawn naturally. As discussed above, the Program has also identified that survival across all of the spread-the-risk release strategies (natural production, pre-smolt releases, eyed-egg releases) increases when smolt releases occur. Program monitoring results demonstrate a corresponding increase in SARs as a result of smolt releases. This supports the theory that higher densities within the river environment lead to better survival (the safety-in-numbers concept; see Response to Comment SHEA 0004-5). It appears that the size of the pulse or density of smolts during out-migration may be a successful strategy to avoid predation (Connell 2000).

Response to Comment SHEA 0004-9

Although there is some uncertainty regarding the population's ability to establish self-sustaining numbers, by using the proposed strategy of releasing up to 1 million smolts and releasing the anadromous adults when they return, the Program employs the two best strategies for moving towards recovery of sockeye salmon. These two strategies increase the possibility of establishing a self-sustaining population and ultimately delisting this population.

As previously discussed, based on the current monitoring and evaluation data, the SARs for naturally produced adult returns (products of captive adult releases spawning naturally within Redfish Lake) have higher SARs than the other release strategies. The brood year 2006 naturally produced adult return SAR of 2.4% (above) is at replacement for this population; this would indicate that recovery of these fish is possible with the current conditions found within the system. As noted in the response to Comment SHEA 0004-5, neither BPA nor the Program cooperators currently have any data that suggest implementation of the Proposed Action would cause survival rates to decrease. And as mentioned earlier, data support that the release of smolts would most likely maintain or increase smolt survival when leaving the basin (safety-in-numbers theory; see Response to Comment SHEA 0004-5), and increased adult returns (released to spawn naturally within Redfish Lake initially) should maintain SARs, which are currently at replacement levels.

As increased locally adapted stocks are established, Program cooperators would continue to conduct extensive natural production and harvest monitoring and evaluation. Table 2 of Appendix E of this EA outlines the performance standards, indicators, benefits, and risks and discusses how each will continue to be monitored and evaluated to ensure that the potential risks of implementing the Proposed Action are minimized. In addition, see the response to Comment SHEA 0004-02 for information about other ongoing efforts to improve conditions for naturally produced fish.

SHEA 0005 – Helen Neville, PhD/Trout Unlimited
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January 13, 2012

To Whom It May Concern,

I would like to register comments regarding the Environmental Assessment (including the Hatchery Master Plan) for the proposed Idaho Department of Fish and Game Springfield Sockeye Hatchery in Bingham County, Idaho. As stated in the documentation, the purpose of this hatchery is to " increase the hatchery's capability of rearing to up to one million sockeye salmon smolts annually ...as part of a larger effort to restore endangered Snake River Sockeye Salmon to the Stanley Basin using information and techniques developed as part of the IDF&G's Snake River Sockeye Salmon Captive Broodstock Program".

My first concern is that the project ignores the true causes of declines of Stanley Basin sockeye salmon. The Master Plan itself recognizes that "the greatest gain in population abundance, productivity and diversity can be accumulated by working lower in the system on improving migration corridor survival rates, reducing harvest levels and improving estuary conditions." I understand, as the document also states, the above actions would be logistically and politically difficult to achieve. However, we in the West are now lucky enough to have in our repertoire several intensive and large-scale salmonid restoration projects (the on-going Elwha River restoration as just one example) that were previously thought to be impossible, exemplifying why such difficulties do not excuse inaction. Ignoring the true causes of the decline stated above will never lead to recovery of native Stanley Basin sockeye salmon. 0005-1

Equally important, the exclusive focus on a hatchery solution (i.e., "implementing actions that are within IDFG control") does not take into consideration the many complexities and potential hazards of hatchery production. A great deal of evidence has emerged recently demonstrating reduced fitness in hatchery fish relative to wild counterparts (Ara ki et al. 2007, Theriault et al. 2011), even where propagation involved wild-type fish and was for conservation purposes (Chilcote et al. 2011). Mechanisms behind such frequently-observed reduced fitness are still somewhat unclear, but in some cases involve extremely rapid adaptation to the hatchery environment (Christie et al. 2011) and/ or the lack of sexual selection driving mate choice (Theriault et al. 2011), among other factors. Recent work on steelhead trout indicates "a single generation in captivity can result in a substantial response to selection on traits that are beneficial in captivity but severely maladaptive in the wild"(Christie et al. 2011). 0005-2

In the case of Redfish Lake sockeye salmon, the Snake River Sockeye Salmon Captive Broodstock program was necessary as an emergency measure to ensure the anadromous form of *Ollcorhyllchlls llerka* would not be permanently lost from Redfish Lake, and is an important *component* of recovery. However, the fact that the hatchery program has been commendably successful by certain measures, *i.e.* in minimizing inbreeding (Waples et al. 2011), does *not* mean these fish will have comparable fitness in the wild or exhibit the locally adapted traits of their wild counterparts (Neff et al. 2011). Indeed, the smolt-to-adult survival rates that have been quantified for the Snake River Sockeye Salmon Captive Broodstock are substantially lower than those of native returns. Simply put, a hatchery fish - even one from the most progressive breeding program - does not equal a wild fish and should not be considered 0005-3 sufficient for recovery of native populations. Thus, the concept proposed of introducing up to one million hatchery smolts into the system annually – effectively swamping the existing native fish - and using this effort to "achieve the adult production criterion required for delisting this species" is highly concerning. Native Stanley Basin sockeye salmon continue to contribute to annual returns, and what actions will be undertaken to promote direct recovery of these existing stocks are insufficiently addressed in the EA and Master Plan. **0005-3 cont'd.**

In addition to the more general concern over using hatchery fish to achieve recovery, the importance of protecting existing biocomplexity (Hilborn et al. 2003) in the few remaining *O. nerka* populations and life histories in the Stanley Basin is ignored in both documents. The benefit of risk spreading through maintenance of spatially asynchronous populations with diversified life histories has been demonstrated clearly in other *O.nerka* populations and other salmonid species in a so-called "portfolio effect" (Greene et al. 2009, Schindler et al. 2010, Haak and Williams In Press) and is part of the recovery goals for Snake River sockeye salmon (McElhany et al. 2000, Waples et al.2011). **0005-4**

The Master Plan states that hatchery fish will be released into Redfish Lake and 2 other lakes, but releasing the same hatchery stock into different locations does not create diversity. Redfish Lake sockeye salmon in particular display unique life history diversity (simultaneous maintenance of kokanee, sockeye salmon and the residual life history) known to exist in only one other sockeye population range-wide (Waples et al. 2011). It is unclear in the current EA and Master Plan how introducing one million smolt of common hatchery origin (even if propagated for conservation purposes) into the Stanley Basin will help to maintain and promote such diversity, as required for recovery. **0005-5**

I urge you to include greater scrutiny of the above issues in tlus process, and appreciate your consideration of my comments as both a concerned citizen and a professional geneticist.

Sincerely,
Helen Neville

Response to Comment SHEA 0005-1

Many factors have played a role in the decline of Snake River sockeye salmon over time; however, it is important to note that multiple habitat and migration corridor changes have occurred recently and net changes have increased the survival of both juveniles and adults returning to this system. Data collected as part of the extensive monitoring and evaluation program associated with Program, have identified SARs that are similar to data collected in the 1950s and 1960s (Bjornn et al. 1968) prior to the development of the Lower Snake River hydro projects. It is important to note that the 2.4% SAR observed in the brood year 2006 natural production group (products of captive adult releases spawning naturally within Redfish Lake) is at replacement for this population; this would indicate that recovery of these fish is possible with the current conditions found within the system. In addition, Program cooperators are also conducting research specific to identifying survival issues within the migration corridor. Current and future research, along with existing monitoring and evaluation studies (research and genetics), will remain a fundamental and integral part of this Program into the future.

For additional information on other ongoing actions to improve conditions for fish, see the response to Comment SHEA 0004-2.

Response to Comment SHEA 0005-2

The Program was implemented in 1991 as a means to safeguard the population from extinction. During the past 20 years, the captive component has been the only means to propagate the population because there were virtually no wild fish left in the population at the time of listing (a small residual component most likely existed within Redfish Lake). The Program includes an extensive genetic component, which has used recommended spawning practices (factorial mating, inbreeding avoidance matrix) and monitored genetic diversity to ensure that significant losses or changes in diversity have not occurred over time as a result of genetic drift, inbreeding or domestication selection. The Program has successfully retained approximately 90% of the founding diversity and has kept inbreeding at modest levels. BPA and the Program cooperators recognize that many captive breeding programs focus exclusively on the maintenance of neutral genetic diversity. Until large returns of anadromous fish back to the basin are observed, the primary concern of the Program has been the gene banking of sockeye salmon. The Program cooperators are also interested in the genetic quality of sockeye salmon and have plans to calculate additive and non-additive genetic variance and investigate adaptive differences with ***single nucleotide polymorphism***[15] genetic markers.

For additional information regarding approaches to minimizing genetic risks associated with the Program, see the response to Comment SHEA 0004-3.

[15] Single nucleotide polymorphism – refers to a sequence in the variation of DNA when a single nucleotide differs between members of the same biological species.

Response to Comment SHEA 0005-3

BPA and the Program cooperators believe that it is important to protect native *O. nerka* and bio-complexity. The Program is different in that the goal is to rebuild an extirpated wild component from a hatchery component instead of supplementing a wild component as is the case with other supplementation or integrated programs. The Program was implemented in 1991 as a means to safeguard the population from extinction. During the past 20 years, the captive component has been the only means to propagate the population because there were virtually no wild fish left in the population at the time of listing (a small residual component likely existed within Redfish Lake). Currently, the Program has no evidence that any outside or unknown genetic contribution exists within Redfish or Pettit Lakes. The allelic diversity within these lakes is similar to the allelic diversity within by the Program. Genetic monitoring of the Program indicates that spawners in the captive program represent the genetic diversity present within the ESU.

Each of the recovery lakes (Redfish and Pettit) supports different populations and life-histories. In the early 1960s, Pettit Lake received chemical treatments and unfortunately, all native *O. nerka* populations were replaced with a non-native resident kokanee population. However, in the early 2000s, the Program released anadromous adults to volitionally spawn and in some years, eyed-eggs in the egg box program. It appears that there may have been some residualization of Program fish within this lake. Currently, both non-native kokanee and residual sockeye salmon reside within the lake. In Redfish Lake, three life-histories , including two genetically distinct populations of sockeye salmon and resident kokanee are present. In Alturas Lake, a native kokanee population exists. In the Springfield Sockeye Hatchery Master Plan, a stepwise progression was outlined where monitoring and evaluation can guide adaptive management. Under the Proposed Action, the Program cooperators would continue to monitor and evaluate the interactions of sockeye salmon, residuals, and kokanee within the lakes with the goal of increasing bio-complexity and re-building locally adapted populations of *O. nerka* within the basin.

As noted previously, the natural adults (which are full-term hatchery adults released to volitionally spawn in the wild) have the highest smolt to SARs at 2.4% compared to the Alturas Lake kokanee SARs of 0.10%. It is difficult to quantify residual sockeye salmon SARs from Redfish Lake because Program cooperators have not been able to determine the proportion of smolts from residuals versus hatchery adults. However, the number of fish in the anadromous return that could have arisen from a wild, residual component was approximately 1% of the natural return.

While there is some uncertainty regarding the population's ability to establish self-sustaining numbers, as mentioned previously, implementation of the Proposed Action would allow the release of up to one million smolts. By combining this strategy with releasing the anadromous adults when they return, Program cooperators would employ the two best strategies for moving towards recovery of sockeye salmon. These two strategies increase the possibility of establishing a self-sustaining population and ultimately delisting this population.

As mentioned previously, the brood year 2006 naturally produced adult return (products of captive adult releases spawning naturally within Redfish Lake) SAR of 2.4% is at replacement for this population; this would indicate that recovery of these fish is possible with the current conditions found within the system. Currently, there are no Program data that would suggest that implementation of the Proposed Action would cause these survival rates to decrease. As mentioned earlier, data support that the release of smolts would likely maintain or increase smolt survival leaving the basin (safety-in-numbers theory) and using the increased adult returns (released to spawn naturally within Redfish Lake initially) should maintain SARs, which are currently at replacement levels.

As noted previously, under the Proposed Action, hatchery-produced smolts would be released within Redfish Lake Creek or within the Salmon River below the headwater rearing lakes. IDFG monitoring and evaluation data have identified the average travel time from Stanley Basin to Lower Granite Dam for hatchery-produced smolts, which is between 9 and 15 days each spring. Based on the available data, competition or density dependence effects would be minimal within the lakes from smolt releases. The available data also suggest that the ecological effects from competition and density dependence would be minimal with releases of up to one million smolts. For additional discussion on competition between hatchery-produced and native fish, please see the response to Comment SHEA 0004-7.

Response to Comment SHEA 0005-4

See the response to Comments SHEA 0004-05.

Response to Comment SHEA 0005-5

Program cooperators acknowledge that the Program has been operating since 1991 without a federal recovery plan in place. Even without such a document, the Program has continued to move forward with collaboration of scientists from state, federal and tribal entities to help guide maintenance and recovery efforts. IDFG developed the Springfield Sockeye Hatchery Master Plan, which is a three-phased recovery plan to serve to adaptively manage and guide future recovery actions.

Emphasis on the words “adaptive management” is important because Program cooperators continue to learn new information about Stanley Basin populations each year. Since the issuance of the Preliminary EA, new information has been gained about the native *O. nerka* population found within Alturas Lake. Because the IDFG believes in the need for biodiversity in all populations, the use of Alturas Lake as an outlet for Snake River sockeye recovery will be delayed (pending a formal recovery plan) to protect the diversity that is represented within this unique lake.

For additional information about addressing genetic risks and ecological interactions, please see the responses to Comments SHEA 0004-03 and 0004-04.

SHEA 0006 – Scott Levy/bluefish.org
redfish@bluefish.org

EA Assessment Team,

In the Appendix A: Snake River Sockeye HGMP of the Master Plan for the Snake River Sockeye Program (November 2010) we learn that: "A draft recovery plan containing strategies to address remaining key limiting factors is expected to be completed later in 2010." (page 29) In actuality, no recovery plan has been completed for Idaho's Sockeye Salmon. "NOAA Fisheries has not developed a recovery plan specific to Snake River sockeye salmon," (page 37) The problem being is that recruit-per spawner ratios are far too low to provide any reasonable expectation of recovery. "Once recruit-per spawner levels, and therefore adult return levels, needed to facilitate population recovery are met," (page 52) "The Department anticipates that releasing up to 1 million smolts could consistently return approximately 5,000 anadromous adults annually." (This represents a 0.5% SAR whereas 4% SAR is estimated to be necessary for recovery, Salmon Subbasin Plan).

With these facts in hand, it becomes apparent why this Springfield Hatchery is prudent even without a recovery plan in place. The Springfield Hatchery is prudent precisely because a recovery plan is not in place. Without a Sockeye Recovery Plan we need to do all that we might to get fish out of the hatchery and into the lakes. Last month's (12/19/11) Science Daily informs us that "Hatcheries Change Salmon Genetics After a Single Generation." Obviously, the preferred alternative would be to have a Sockeye Recovery Plan in place. Short of that, the Springfield Hatchery is a best option faced with the Do Nothing Alternative. Language to this effect would be worthwhile for decision-makers who might read the Environmental Assessment. The preliminary EA before me does not make this valid argument clear to the reader. Instead, on page 15 we are n left to investigate for ourselves when we come upon the statement, "The following comments were made during scoping. These topics have been addressed in appropriate sections in this EA: 1) The proposed Springfield Sockeye Hatchery Project is not prudent without a Sockeye salmon recovery plan in place. 2)…" 0006-1

Being straightforward would seem to be the best course of action. Thank you for taking time to consider my comments.

Sincerely,

Scott Levy,

host of www.bluefish.org

Response to Comment SHEA 0006-1

IDFG has recently received an update indicating that NOAA Fisheries expects to initiate consultation on the Sockeye Salmon Recovery Plan with Program cooperators in 2012 and is hoping to produce a draft product for review by late 2013. For additional information related to how the Program cooperators are operating in the absence of a formal recovery plan, please see the response to Comment SHEA 0004-1.

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