Springfield Sockeye Hatchery Project

Finding of No Significant Impact
Revision Sheet for the
Environmental Assessment
Mitigation Action Plan
Preliminary Environmental Assessment

May 2012

DOE/EA – 1913

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DOE/EA-1913
Bonneville Power Administration

May 2012

DEPARTMENT OF ENERGY

Bonneville Power Administration
Springfield Sockeye Hatchery Project
Finding of No Significant Impact

Summary

The Bonneville Power Administration (BPA) is announcing its environmental findings regarding the decision to fund the Springfield Sockeye Hatchery Project (Proposed Action). BPA is proposing to fund the Idaho Department of Fish and Game (IDFG) to modify and operate an existing hatchery facility located near the town of Springfield in Bingham County, Idaho. IDFG would convert this hatchery into a facility that would be capable of rearing up to 1 million Snake River sockeye salmon (*Oncorhynchus nerka*) smolts for release into the Sawtooth Basin.

BPA has prepared an environmental assessment (EA) (DOE/EA-1913) to evaluate the Proposed Action and its alternative. Based on the analysis in the EA, BPA has determined that, with the use of mitigation measures, the Proposed Action is not a major federal action that significantly affects the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an environmental impact statement (EIS) is not required, and BPA is issuing this Finding of No Significant Impact (FONSI) for the Proposed Action. Comments received on the Preliminary EA as well as the responses to the comments are provided in the Revision Sheet for the EA.

The attached Mitigation Action Plan (MAP) lists all of the mitigation measures that BPA and IDFG are committed to implementing as part of the Proposed Action.

Public Availability

The FONSI will be mailed directly to interested parties, a notification of availability will be mailed to potentially affected parties, and the FONSI will be posted on BPA's website.

Project Background

BPA is proposing to fund the IDFG to implement the Springfield Sockeye Hatchery Project, which IDFG is proposing to help promote the recovery of Upper Snake River sockeye salmon, an endangered species under the Endangered Species Act (ESA). The Proposed Action would involve converting the existing hatchery into a facility that would be capable of rearing up to 1 million Snake River sockeye salmon juveniles to the full-term smolt stage of development. These smolts would then be released in the Upper Salmon River subbasins and the Sawtooth Basin in Custer County and Blaine County, Idaho. The Proposed Action is part of the IDFG and National Oceanic and Atmospheric Administration (NOAA Fisheries) Snake River Sockeye Captive Broodstock Program (Program) and the subject of the 2010 *Springfield Sockeye Hatchery Master Plan for the Snake River Sockeye Program* (Springfield Master Plan).

BPA is directed by the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) to implement protection, mitigation, and enhancement actions for fish and wildlife, as well as their habitats, affected by the construction and operation of the Federal

Columbia River Power System (FCRPS) (16 United States Code [USC] 839b(h)(10)(A)). To assist in accomplishing this, the Northwest Power 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. The Springfield Sockeye Hatchery Project has been favorably reviewed by NPCC, and BPA's funding of the Proposed Action will help BPA meet its Northwest Power Act obligations. In addition, funding the Proposed Action will help BPA fulfill the conditional commitments outlined in the 2008 Columbia Basin Fish Accords Memorandum of Agreement with the State of Idaho (Idaho Fish Accords) and the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010.

Proposed Action

BPA is proposing to fund the modification of an existing IDFG trout hatchery near Springfield, Idaho, to provide a facility that would be capable of rearing up to 1 million Snake River sockeye salmon juveniles. Modifications would include demolishing several existing structures, constructing new hatchery facilities in the same footprint, constructing three new residences for hatchery personnel northwest of the hatchery site, and constructing up to six pumps at existing wellheads and a piping system to convey water to hatchery facilities. Recreational use of Crystal Springs Pond would continue, similar to existing conditions. Once the hatchery is operational, broodstock would continue to be collected at existing facilities as part of the ongoing Snake River Sockeye Captive Broodstock Program, and fertilized eggs would be transported to the Springfield Hatchery for rearing. Fish produced at the hatchery would be transported and released to lakes located in the Upper Salmon River Basin of central Idaho, including Redfish and Pettit lakes and their associated outfalls, each spring. As adult run size increases, the goal is to eliminate redundant facilities (e.g., those needed for captive broodstock) and determine when the Program should transition to the next phase of implementation.

No Action Alternative

Under the No Action Alternative, BPA would not fund the Springfield Sockeye Hatchery Project; therefore, the Proposed Action would most likely not be implemented. IDFG would continue to operate the Program without supplementing fish production at the Springfield Hatchery. Achieving the target of increasing production to between 500,000 and 1 million smolts, as established in the basin-wide guidance documents (FCRPS Biological Opinion, Idaho Fish Accords), would take longer. As a result, under the No Action Alternative, achieving the interim recovery criteria established by NOAA Fisheries in the Proposed Recovery Plan for Snake River Salmon would be delayed. Also, without additional space to expand the Program, there is an increased risk of domestication and a further loss of fitness in the sockeye population over time.

Significance of the Potential Impacts of the Proposed Action

To determine whether the Proposed Action or the No Action Alternative has the potential to cause significant environmental effects, the potential impacts of each alternative on human and natural resources were evaluated. This impact analysis for the Proposed Action is presented in Chapter 3 of the EA and summarized below. To evaluate potential impacts from construction, operation, and maintenance activities, four impact levels were used (i.e., high, moderate, low, and no impact). These impact levels are based on the considerations of context and intensity defined in the Council of Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1508.27). High impacts could be considered significant impacts, while moderate and low impacts would not. The Proposed Action would have no significant impacts.

The following discussion provides a summary of the Proposed Action's potential impacts and the reasons these impacts would not be significant.

Land Use and Recreation

Impacts on land use and recreation would be low to moderate.

- Recreationists at Crystal Springs Pond would be only temporarily disrupted during construction.
- Crystal Springs Pond water quality would be maintained for recreational fishing because IDFG would monitor water quality. Recreationists at American Falls Reservoir would not be disrupted because the hatchery discharge would be required to comply with the terms of IDFG's National Pollutant Discharge Elimination System permit.
- The proposed land uses are consistent with the surrounding land uses, applicable land use plans, and zoning and would not result in substantial long-term impacts on adjacent land uses.
- Land use or recreational opportunities at Redfish or Pettit lakes would not be disrupted because outstocking activities would occur over a period of a few weeks each year. Furthermore, additional recreational fishing opportunities could occur as adult sockeye salmon return to spawn.

Visual Resources

Impacts on visual resources would be low to moderate.

- Visual changes associated with construction equipment and activity would be temporary but may disproportionately affect recreationists at Crystal Springs Pond.
- Construction of the hatchery and associated staff residences would permanently change the visual resources at the site of the existing facility. However, the majority of the changes would not be visible to sensitive viewers, such as recreationists at Crystal Springs Pond or neighboring landowners.

Vegetation
Impacts on vegetation would be low.

- Permanent and temporary direct impacts would generally affect two vegetation communities: disturbed grassland areas and developed/disturbed lands. Direct impacts on native plant communities would be temporary and limited.
- Mitigation measures would address indirect impacts by reducing the spread of noxious weeds, erosion, and sedimentation.
- BPA consulted with the U.S. Fish Wildlife Service (USFWS) under Section 7 of the ESA regarding impacts of the Proposed Action on Ute ladies'-tresses. USFWS concluded that the Proposed Action would not adversely affect the orchid.

Water Quality and Quantity
Impacts on water quality and quantity would be low.

- Surface water and groundwater quality impacts from construction would be reduced by mitigation measures and best management practices.
- Crystal Springs Pond water quality would be maintained because water quality within the pond would be monitored, and water use at the hatchery would be modified to provide more flow if necessary.
- Disease outbreaks at the hatchery would be minimized and controlled, and no discharges to waters that support ESA-listed anadromous salmonids would occur.
- Groundwater drawdown would be localized, and the aquifer would recharge after the cessation of pumping each year.

Wetlands and Floodplains
Impacts on wetlands would be low to moderate; there would be no impacts on floodplains.

- All appropriate permits from the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) would be obtained, and all work would comply with the mitigation required by EPA and the Corps.
- Erosion control measures to avoid sedimentation in wetlands and streams would be used.
- Minor wetland loss may result around the edge of or along adjacent stream channels of Crystal Springs Pond if IDFG reduces inflow to the pond.

Soils and Geology
Impacts on soils and geology would be low.

- Erosion and sedimentation would be minor with the use of best management practices related to controlling erosion and the timing of the disturbance.
- Proper design of the proposed hatchery office building and the on-site residences would reduce potential impacts on soils.

Fish and Wildlife
Impacts on fish and wildlife would be low.

- Construction noise and increased human presence would be low, temporary, and limited to the construction area and immediately adjacent habitats. Noise, traffic, and human activities associated with hatchery operations could result in temporary wildlife displacement during high activity periods, such as during spring smolt outstocking. No special-status fish or wildlife species are located in proximity to the hatchery site.
- There would be no impacts related to competition for space and prey for any of the salmonid species in the Salmon, Snake, and Columbia rivers, including those that are federally listed under the ESA (i.e., Snake River Chinook fall run [*O. tshawytscha*], Snake River Chinook spring/summer run [*O. tshawytscha*], and Snake River steelhead summer run [*O. mykiss*]), nor would there be any impacts related to protected habitat (e.g., essential fish habitat or critical habitat) as a result of the proposed outstocking activities.
- Potential impacts associated with genetic interactions between anadromous fish species, including those that are listed under the ESA, would be addressed and reduced through the implementation of the Draft Genetic Hatchery Management Plan.
- Since the listing of Snake River sockeye salmon in 1991, IDFG has been authorized by NOAA Fisheries under an ESA Section 10 direct take permit (#1120) to operate the existing supplementation program and a Section 6 ESA permit to conduct associated research activities on Snake River sockeye salmon. Potential effects on bull trout (*Salvelinus confluentus*) associated with these activities are also covered under these permits.
- With respect to activities unique to the Proposed Action, BPA consulted with USFWS under Section 7 of the ESA regarding the impacts of the Proposed Action on bull trout and its critical habitat. USFWS determined that the Proposed Action would not adversely affect bull trout or its critical habitat. The proposed activities may enhance the bull trout population by re-establishing a historic prey item (Snake River sockeye salmon smolts) for the bull trout within the river, and returning adult salmon may incrementally add to the nutrient budget of Sawtooth Valley lakes.
- There would be no impacts on natural fall Chinook production in the Upper Snake or Salmon River basins because fall-run Chinook do not occupy the Upper Snake or Salmon River basins, and there is no designated critical habitat.
- There would be no significant impacts on natural spring/summer Chinook production in the Salmon, Snake, and Columbia rivers because sockeye smolts would migrate relatively quickly downstream after release. Returning adults would not adversely affect juvenile spring/summer Chinook during Chinook smolt migration because sockeye salmon smolts would be migrating at a different time of year.
- There would be no significant impacts on Snake River summer-run steelhead because the sockeye salmon smolts would migrate relatively quickly downstream after release. Competition or density-dependence effects would be minimal. Returning adults would not negatively affect juvenile summer-run steelhead during steelhead smolt migration because sockeye salmon smolts would be migrating at a different time of year.

Cultural Resources
Impacts on cultural resources would be low.

- No known resources that are eligible for listing in the National Register of Historic Places (NRHP) are located within the project area, and based on the inventories conducted, the likelihood of encountering additional unknown cultural sites is low.

Transportation
Impacts on transportation would be low.

- Daily traffic volumes on existing roadways would increase only temporarily during construction activities and would not substantially degrade traffic operations on the local roads.
- The transporting of sockeye salmon smolts to outstocking locations during hatchery operations would be limited to about 40 trips each spring. Additional trips related to hatchery operations would also be easily accommodated by the highways and roads in the area.

Noise and Public Health and Safety
Impacts from increased noise levels would be low to moderate.

- Although pipeline trenching activities during construction would be noticeable and potentially disruptive to recreational fisherman at Crystal Springs Pond, impacts would be temporary and consistent with state noise regulations.
- Potential health and safety risks due to construction activities would be minimized through the development and implementation of a safety plan prepared by the contractor.

Socioeconomics and Environmental Justice
Impacts related to socioeconomics and environmental justice populations would be low.

- Because construction activities would be temporary (several phases over a total of about16 months), it is not anticipated that construction would induce any permanent changes to the population in the study area.
- Although direct and indirect expenditures from project construction would be beneficial, expenditures would represent only a small proportion of the total annual income in the study area.
- Increases in sales tax revenue to the state from purchases by construction and hatchery workers would be minimal.
- Although there would be a potential increase in employment due to hatchery operations, it would not have a discernable long-term effect on the labor market in the study area.
- The economic well-being of people who are dependent on the fishing industry in the area could improve to the extent that the increased fish populations could improve the long-term health and resilience of Idaho's Snake River sockeye runs.
- Operation of the Proposed Action would be equally borne by all individuals within the surrounding area and would not disproportionately affect environmental justice populations. In addition, the Shoshone Bannock tribes would benefit from the increased production of fish.

Public Facilities and Energy
Impacts on public facilities and energy would be low.

- Increases in the level of demand for local law enforcement and emergency service providers during construction would most likely be low and within their service abilities.
- The amount of waste that would be generated by the project can be accommodated by local landfill sites and transfer stations.
- Impacts on water supply and water treatment services would be low because potable water would be provided via an existing artesian well, consistent with IDFG's water right; hatchery sewage would be treated via an on-site treatment and disposal system; and hatchery effluent would be treated on site prior to discharge, consistent with the requirements of the National Pollutant Discharge Elimination System permit.
- Energy consumption would be low relative to existing supply and would be further reduced through the implementation of energy-reducing measures.

Air Quality
Impacts on air quality would be low.

- Minor increases in emissions due to construction would be temporary and would occur in localized areas that are in compliance with the National Ambient Air Quality Standards.
- Small amounts of organic, potentially odorous wastes generated during hatchery operations would have a low potential to affect neighboring homes because the closest homes would be roughly 2,000 feet from the proposed hatchery.
- Forecast long-term greenhouse gas emissions generated by the project would be only a small fraction of the CEQ's evaluation threshold of 25,000 tons per year of carbon dioxide equivalent.
- Potential impacts on hatchery operations from future climate change would be low because the hatchery would have feasible options for compensating for potential decreases in water supply.

Determination

Based on the information in the EA, as summarized here, BPA has determined that the Proposed Action is not a major federal action that significantly affects the quality of the human environment, within the meaning of NEPA, 42 USC 4321 et seq. Therefore, preparation of an EIS is not required, and BPA is issuing this FONSI.

Issued in Portland, Oregon, on May 3, 2012.

/s/ F. Lorraine Bodi
F. Lorraine Bodi
Vice President
Environment, Fish, and Wildlife

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

1.4.1 Northwest Power Act

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.

[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.

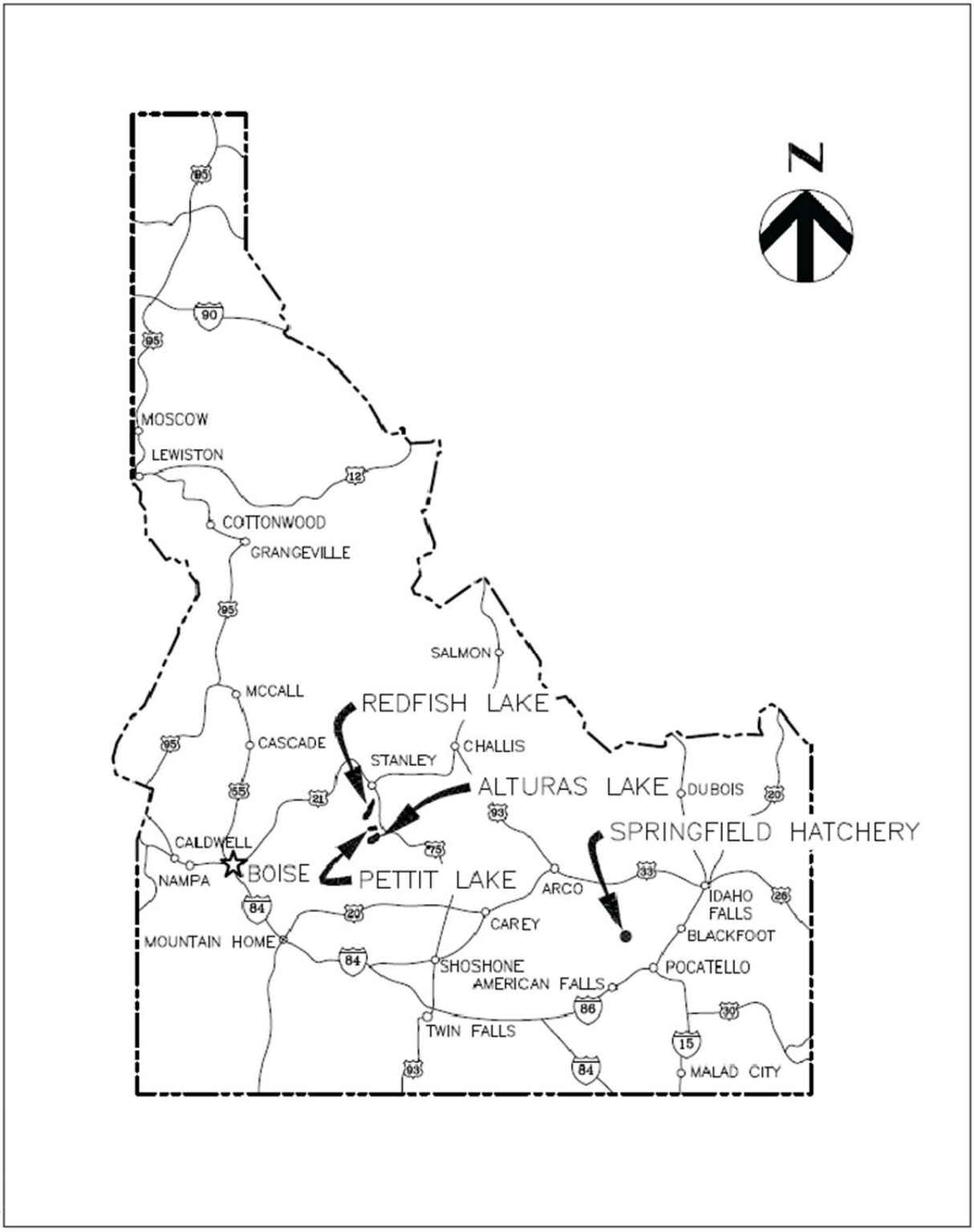

Figure 2-2
Proposed Outstocking Locations

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.

[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
2410 Gail Drive
Pocatello, ID 83201

81/18/2612 12:41 288--232- 6647

Kitty E. Griswold, PhD.
2410 Gail Drive
Pocatello, Idaho 83201

January 17, 2011

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). 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. 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). 0004-1 0004-2 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.

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.

0004-9 cont'd.

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

[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.

[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.

[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 (Araki 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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Mitigation Action Plan

for the

Springfield Sockeye Hatchery Project

DOE/EA-1913

Summary

This Mitigation Action Plan (MAP) is referenced in the Finding of No Significant Impact (FONSI) for the Springfield Sockeye Hatchery Project (Proposed Action) (Department of Energy Environmental Assessment-1913). This project involves modifying the existing Idaho Department of Fish and Game (IDFG) hatchery located near the town of Springfield in Bingham County, Idaho. With funding provided by the Bonneville Power Administration (BPA), IDFG would modify this hatchery so that it would be capable of rearing up to 1 million Snake River sockeye salmon.

This MAP includes all of the mitigation measures recommended in the Final Environmental Assessment (EA) to mitigate adverse environmental impacts. It includes some measures that are essential to render the impacts of the Proposed Action not significant and other measures that will decrease impacts that did not reach a level to be considered significant.

Mitigation has and will occur throughout the entire timeframe of the project. Mitigation has occurred during the planning and design phase, and it will continue during pre-construction planning, construction, and after construction is completed (when the site is being stabilized and revegetated). The purpose of this MAP is to explain how the mitigation measures were or will be implemented. It clearly identifies the components of each mitigation measure, as well as what time during the project they were or will be implemented, and who was or is responsible for implementation.

The implementation of this project will be overseen by IDFG and built by contractors. To ensure that the contractor will implement mitigation measures, the relevant portions of this MAP will be included in the construction contract specifications (the directions to the contractor) for the project. This will obligate the contractor to implement the mitigation measures that relate to their responsibilities during construction and post-construction.

If you have general questions about the project, contact the project manager, Jan Brady, at 503-230-4514 or jebrady@bpa.gov. If you have questions about the MAP, contact the environmental lead, Jenna Peterson, at 503-230-3018 or jepeterson@bpa.gov. This MAP may be amended if revisions are needed due to new information or if there are any significant project changes.

Consultation Related to Mitigation Measures

BPA consulted with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA). BPA submitted a Biological Assessment to USFWS on February 27, 2012, requesting concurrence with its determinations that the Proposed Action is not likely to affect bull trout or its designated critical habitat or the Ute ladies'-tresses adversely and the action would have no effect on the Canada lynx. USFWS concurred with BPA on April 3, 2012, and determined that the Proposed Action is not likely to affect bull trout, bull trout critical habitat, or Ute ladies'-tresses adversely. No ESA-listed anadromous species are present within the hatchery site. Impacts on these species during the incidental capture and subsequent handling activities associated with outmigration sampling are covered under a separate ESA consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries.

As part of the Section 106 consultation process under the National Historic Preservation Act, a cultural resources assessment of the potential for the study area to support historic, archaeological, and Native American resources was completed in July 2011. The cultural resources assessment was based on a review of known archaeological resources within a 1-mile radius of the study area, as inventoried at the Idaho State Historic Preservation Office (SHPO), Boise, Idaho. BPA also provided information and requested input on the Proposed Action from the following tribes during development of the EA: the Shoshone Bannock Tribes of the Fort Hall Reservation, the Shoshone Paiute Tribes of the Duck Valley Reservation, the Fort McDermitt Paiute-Shoshone Tribe, the Burns Paiute Tribe, and the Nez Perce Tribe of Idaho. Consultation with these tribal organizations was initiated on July 12, 2011.

BPA received concurrence on the area of potential effect (APE) from the SHPO on August 5, 2011. No responses were received as a result of tribal consultation. A pedestrian survey and shovel testing of the study area was completed in August 2011. A report detailing the results of this work and a determination of no historic properties affected was submitted to the consulting parties in early November 2011. In early December, the SHPO requested that BPA submit additional information, including updated historic properties site forms, which BPA did in mid-February 2012. In late February 2012, the SHPO provided its response, containing a determination that the Proposed Action would have an adverse effect on historic properties. Because of this discrepancy in effects determination, BPA hired an architectural historian to conduct further analysis of the age of the hatchery buildings and the role the buildings played in the development of fish rearing in southern Idaho.

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. Minimal maintenance activities and upgrades had taken place since its original construction. As a result, the facility is run-down. These structures do not meet the 50-year age threshold for listing in the National Register of Historic Places (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. Therefore, these structures are not considered historic properties under the National Historic Preservation Act, and the Proposed Action would have no adverse effect on historic properties.

Mitigation Measures

The following minimization and mitigation measures have been identified to reduce potential impacts associated with the Proposed Action.

Environmental Resource	Mitigation
Land Use and Recreation	• Obtain appropriate permits from Bingham County to allow for new residences to be constructed in a heavy manufacturing zone. • Develop and distribute a schedule of construction activities to potentially affected landowners near the construction site to inform residents when they may be affected by construction activities; advertise the construction schedule in local newspapers and post it in public places, those customarily used for public notices, such as libraries, post offices, and local government buildings, and also at Crystal Springs Pond to inform recreationists of construction activities. • Conduct a preconstruction public meeting and invite landowners to meet with contractors and IDFG staff responsible for project implementation to receive information and discuss concerns. • Provide appropriate contact information for contractor liaisons and IDFG staff to local residents for any concerns or complaints during construction.
Visual Resources	• Restore disturbed vegetation as soon as possible after construction is completed. • To the extent possible, design of the wellhead structures will include the use of non-reflective materials and downward-facing lighting.
Vegetation	• Restrict activity and traffic to construction areas to limit unnecessary disturbance of native plant communities and reduce the spread of non-native species and noxious weeds. • Identify clearing limits on all construction drawings. Use high-visibility construction fencing to demarcate the limits of construction and vehicle operation to prevent disturbance from occurring outside allowable areas. • Revegetate temporarily disturbed areas with appropriate native species. Use seed mixes that meet the requirements of federal, state, and county noxious weed control regulations and guidelines. • If any previously undiscovered rare, threatened, or endangered plant species is observed before or during project implementation, fence off and avoid these individuals. • If individuals of Ute ladies'-tresses are observed before or during project implementation and impacts cannot be avoided, implement compensatory mitigation as determined by USFWS. • Implement a noxious weed control program prior to and during construction. This control program will include the following elements: o Treat known infestations before ground disturbance begins by scheduling appropriate weed treatments, such as mowing, hand pulling, and use of approved herbicides. o Map and flag areas of noxious weed populations for construction crews so these populations can be avoided when possible. o Ensure equipment brought into the construction area is free of weeds and weed seeds. o Work from relatively weed-free areas into the infested areas rather than vice-versa. o Clean equipment and vehicles of mud, dirt, and plant parts after working in infested areas. o Maintain weed-free staging areas. o Apply herbicides according to labeled rates and recommendations to ensure protection of surface water, ecological integrity, and public health and safety. o Implement and periodically schedule post-construction control of noxious weeds on an as-needed basis.

Environmental Resource	Mitigation
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; ensures 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, ensures that contractors will be trained to contain the spill immediately, eliminate the source, and deploy appropriate measures to clean 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.~~

Environmental Resource	Mitigation
	• 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.
Wetlands	• Locate roads and other design features to avoid or minimize impacts on wetlands and streams whenever possible. • When working next to wetlands (including their buffer areas) and waterbodies, limit disturbance to the minimum necessary to achieve construction objectives; minimize habitat alteration and the effects of erosion and sedimentation. • Flag or stake wetland boundaries in the vicinity of construction areas so that wetlands and streams can be avoided during construction. • Do not place machinery, construction vehicles, or equipment within ~~100~~ 200 feet of any stream or wetland unless placement is authorized by a permit or is on an existing road. • Refuel machinery and store it a minimum of ~~150~~ 200 feet from wetlands and waterways and inspect it regularly for leaks. • If temporary roads are built in wetlands, underlay temporary fill with geotextile fabric or portable pads, remove all fill, and revegetate with appropriate native wetland plant species in compliance with required permits. • Design and implement any construction activities to minimize unavoidable impacts, coordinate with the U.S. Army Corps of Engineers to obtain a Section 404 permit for any fill placed in wetlands, and work with the Idaho Department of Environmental Quality to obtain Section 401 water quality certification for this permit (see Section 4.3). • 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 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. • ~~Implement an erosion control and sedimentation plan, which will include sedimentation and erosion control measures, such as silt fences, straw bales, and jute matting to prevent sediment from entering waterways and wetland habitats.~~ • Revegetate temporarily disturbed areas with appropriate native species. Use seed mixes that meet the requirements of federal, state, and county noxious weed control regulations and guidelines. • 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.

Environmental Resource	Mitigation
Geology and 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 <u>within 200 feet of streams, other waterbodies, and wetlands; manage sediment as specified in a Stormwater Pollution Prevention Plan</u> 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.
Fish and Aquatic Species	• <u>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.</u> ~~• 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.

Environmental Resource	Mitigation
Wildlife	• Explain wildlife-related mitigation measures to construction contractors and inspectors during a preconstruction meeting covering environmental requirements. • Avoid clearing native habitats during the avian breeding season (March through July). If clearing cannot be avoided during these times, survey the clearing zone prior to activity to determine whether any active nests of migratory birds are present. If active nests are detected, develop a plan to avoid impacts until young have fledged.
Cultural Resources	• Use appropriate BMPs, 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.
Transportation	• Provide appropriate contact information for contractor liaisons and IDFG staff to local residents for any concerns or complaints during construction. • Keep construction activities and equipment clear of residential driveways to the greatest extent possible. • Employ traffic control flaggers and post signs along roads warning of construction activity and merging traffic for temporary interruptions of traffic where needed.
Noise and Public Health and Safety	• Limit noise emissions from the wellhead water supply pumps to no more than 69 A-weighted decibels (dBA) at a 50-foot reference distance. • Limit outdoor noise emissions from the proposed hatchery's water recirculation pumps and mechanical water chillers to no more than 73 dBA at a 50-foot reference distance. • Limit outdoor noise emissions from the backup diesel generator to no more than 73 dBA at a 50-foot reference distance. • Employ a liaison who would be available to provide information, answer questions, and address concerns during project construction. • Schedule all construction work during daylight hours. • Locate stationary construction equipment as far away from noise-sensitive receptors as possible. • Require sound control devices on all construction equipment powered by gasoline or diesel engines that are at least as effective as those originally provided by the manufacturer. • Operate and maintain all construction equipment to minimize noise generation.
Public Facilities and Services	• Coordinate with local law enforcement, fire protection, and other emergency responders to ensure they are prepared to address any emergencies that may arise during construction and operation. • Coordinate the routing and scheduling of construction traffic with the relevant county and state road staff to minimize interruptions to local traffic.
Energy	• Where possible, use high-efficiency light fixtures (e.g., LED, compact fluorescent, high-efficiency fluorescent bulbs). • Where possible, install automatic lighting controls, including occupancy sensors and lighting control panels. • Use skylights, windows, and/or opaque wall panels for natural lighting of the large early rearing room and occupied spaces. • Use chilled water energy recovery via water-to-water heat exchangers. • Use premium efficiency pump motors on process water systems and heating, ventilation, and air-conditioning (HVAC) units.

Environmental Resource	Mitigation
	• Use artesian well water flow for the proposed hatchery water supply to the greatest degree practical. • Install low-flow plumbing fixtures for domestic uses to reduce well pumping. • Install a central flow monitoring and control system.
Air Quality	• Transport all vegetation or other debris associated with construction clearing to an approved landfill. (Burning of all such material will not be done; some small-scale vegetation burning may be done for weed control on access roads.) • Use water trucks to control dust during construction as needed. • Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions. • Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions. • Implement vehicle idling restrictions. • Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions. • Locate staging areas in previously disturbed or graveled areas where practicable to minimize soil and vegetation disturbance. • Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel that would not be necessary. • Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable. • Reduce electricity use in the construction office by using compact fluorescent bulbs and turning off computers and other electronic equipment every night. • Recycle or salvage nonhazardous construction and demolition debris where practicable.

Springfield Sockeye Hatchery Project

Preliminary Environmental Assessment

December 2011

DOE/EA – 1913

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Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
ASFD	Aberdeen/Springfield Fire District
BEA	Bureau of Economic Analysis
BMPs	best management practices
BPA	Bonneville Power Administration
BSRFD	Blackfoot/Snake River Fire District
Bureau	U.S. Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CO_2	carbon dioxide
CO_2e	CO2 equivalents
Corps	U.S. Army Corps of Engineers
CVM	Center for Veterinary Medicine
dBA	A-weighted decibels
DOE	United States Department of Energy
DPS	distinct population segment
EA	Environmental Assessment
EDRR	Early Detection Rapid Response
EIRMC	Eastern Idaho Regional Medical Center
EIS	Environmental Impact Statement
EMTs	emergency-medical technicians
EPA	U. S. Environmental Protection Agency
ESA	Endangered Species Act
ESPA	East Snake Plain Aquifer
ESU	evolutionarily significant unit
FCRPS	Federal Columbia River Power System

FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FILT	fee in lieu of taxes
FONSI	Finding of No Significant Impact
GHGs	greenhouse gases
gpm	gallons per minute
hazmat	hazardous materials
HSRG	Hatchery Scientific Review Group
HVAC	heating, ventilation, and air conditioning
Idaho 39	Idaho State Highway 39
Idaho 75	Idaho State Highway 75
Idaho Fish Accords	2008 Columbia Basin Fish Accords Memorandum of Agreement
IDFG	Idaho Department of Fish and Game
IDWR	Idaho Department of Water Resources
IHN	Infectious Hematopoietic Necrosis
IHOT	Integrated Hatchery Operation Team
kW	kilowatt
Master Plan	Springfield Sockeye Hatchery Master Plan
mg/L	milligrams per liter
MPG	major population group
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northwest Power and Conservation Council
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PM10	particulate matter less than 10 micrometers in size
PM2.5	particulate matter less than 2.5 micrometers in size
RV	recreational vehicle
S/cm	Siemens per centimeter
SBSTOC	Stanley Basin Sockeye Technical Oversight Committee

7SHPO	State Historic Preservation Office
SPCC Plan	Spill Control, Containment and Countermeasures Plan
SWPP Plan	Stormwater Pollution Prevention Plan
TMDL	total maximum daily load
TSS	total suspended solids
US 93	U.S. Route 93
USC	U.S. Government Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Chapter 1
Purpose of and Need for Action

1.1. INTRODUCTION

The Bonneville Power Administration (BPA) is proposing to provide funding to the Idaho Department of Fish and Game (IDFG) for the proposed Springfield Sockeye Hatchery Project (Proposed Action). The Proposed Action would involve modification of IDFG's existing hatchery located near the town of Springfield in Bingham County, Idaho, (Figure 1-1). With funding provided by BPA, IDFG would convert this hatchery into a facility capable of rearing up to 1 million Snake River sockeye salmon (*Oncorhynchus nerka*) ***evolutionarily significant unit*** (ESU) [1] ***smolts***. Smolts raised at the Springfield Hatchery would be ***outplanted*** in the Upper Salmon River Basin to supplement natural populations of sockeye salmon. The Springfield Sockeye Hatchery Project would help IDFG and the National Oceanic and Atmospheric Administration (NOAA) Fisheries expand their existing Captive Broodstock Project.

This Environmental Assessment (EA) was prepared by BPA pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 U.S. Government Code [USC] 4321 et seq.), which requires federal agencies to assess the impacts their actions may have on the environment. Major federal actions significantly affecting the quality of the human environment must be evaluated in an Environmental Impact Statement (EIS). BPA prepared this EA to determine if its Proposed Action of providing funding to IDFG for its project would cause effects of a magnitude that would warrant preparing an EIS, or whether it is appropriate to prepare a Finding of No Significant Impact (FONSI).

Pursuant to 40 Code of Federal Regulations (CFR) 1501.6, the U.S. Environmental Protection Agency (EPA) has agreed to serve as a cooperating agency in the development of this EA to support its consideration of a new source National Pollutant Discharge Elimination System (NPDES) permit application for the Proposed Action.

This chapter of the EA discusses BPA's need for taking action at this time and the purposes that BPA seeks to achieve in addressing this need, provides the background information on BPA's responsibilities and the Snake River Sockeye Captive Broodstock Program, and identifies the decisions to be made and public input on the proposal that has been received to date.

1.2. NEED FOR ACTION

BPA needs to decide whether to provide funding to IDFG for its proposal to modify its existing hatchery so that it can produce sockeye salmon in the Upper Snake River Subbasin. Upper Snake River sockeye salmon are declining and considered a priority for recovery, having been listed as an endangered species under the Endangered Species Act (ESA) since 1991. Current production of Snake River sockeye salmon is restricted by capacity limitations.

[1] Terms defined in Chapter 6, Glossary, are shown in bold, italicized typeface the first time they are used.

Figure 1-1
Project Location Map

1.3. PURPOSES

Purposes are goals or objectives that BPA seeks to achieve in addressing the need for agency action. BPA will use the following purposes to evaluate the alternatives considered in the EA:

- Act consistently with all applicable laws, regulations, and policies that guide the agency;
- Support efforts to mitigate for effects of the Federal Columbia River Power System (FCRPS) on fish and wildlife in the mainstem Columbia River and its tributaries pursuant to the Pacific Northwest Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 *et seq.*);
- Assist in carrying out obligations related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement (Idaho Fish Accords)—specifically, those related to IDFG (Appendix A) (Bonneville Power Administration et al. 2008);
- Seek to fulfill commitments to implement the pertinent Reasonable and Prudent Alternatives listed for Snake River sockeye salmon in the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010 (National Oceanic and Atmospheric Administration Fisheries 2008, 2010);
- Minimize environmental impacts; and
- Act in a cost-effective manner.

1.4. BACKGROUND

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 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 2001). 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 reviews the proposed projects as they move from one stage of the process to the next.

In addition to Northwest Power Act obligations, BPA, as a federal agency, also must comply with the 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 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 in response to the decline of anadromous returns to the Sawtooth Valley in central Idaho. The Captive Broodstock 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.

The Captive Broodstock 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 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 plan, entitled the *Springfield Sockeye Hatchery Master Plan for the Snake River Sockeye Program* (Springfield Master Plan) (Idaho Department of Fish and Game 2010) 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, 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.

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.

1.5. DECISIONS TO BE MADE

1.5.1. Bonneville Power Administration

The decision to be made by BPA for this Proposed Action is whether BPA will provide funding to IDFG for its proposal to modify an existing hatchery for Snake River sockeye production. Prior to making this decision, BPA is required under NEPA to assess the potential environmental effects related to BPA's funding of the Proposed Action. If, based on the analysis in this EA, BPA determines that these impacts are not significant, BPA would issue a FONSI for this proposal. If, however, BPA determines that any of these potential impacts are significant, BPA would proceed with preparation of an Environmental Impact Statement (EIS) for the proposal. At the conclusion of the NEPA process – either issuance of a FONSI or completion of the EIS process – BPA would make its decision on whether to provide the requested funding.

1.5.2. U.S. Environmental Protection Agency

As the NPDES permitting authority in the state of Idaho, EPA would require issuance of a NPDES permit prior to implementation of the Proposed Action. New effluent limitation guidelines and new source performance standards for the Concentrated Aquatic Animal Production Point Source Category were promulgated on September 7, 2004, and became effective on September 22, 2004. Aquaculture facilities constructed or replaced after promulgation of these new source performance standards are considered new sources under 40 CFR 122.29. In accordance with Section 511(c)(1) of the Clean Water Act and EPA's regulations for implementing the procedural provisions of NEPA at 40 CFR Part 6, the issuance of NPDES permits for new sources is considered a major federal action subject to NEPA review.

EPA has determined that the modifications, replacement of facilities, and new construction associated with the Proposed Action would render it a new source facility under 40 CFR 122.29. As a new source, issuance of a NPDES permit for the facility would be subject to NEPA review. To fulfill its obligations under NEPA, as well as pursuant to 40 CFR 1501.6 and 40 CFR 6.202, EPA has agreed to participate as a cooperating agency in the preparation of this EA. EPA will independently evaluate the analyses and conclusions of the EA and either prepare a FONSI or, if impacts are determined to be significant, an EIS and Record of Decision.

1.6. ISSUES IDENTIFIED DURING SCOPING

BPA conducted public outreach for the Proposed Action through various means, including public notice of the Proposed Action, the environmental process, and opportunities to comment. On May 27, 2011, BPA sent a letter to people potentially interested in or affected by the Proposed Action, including adjacent landowners, public interest groups, local governments, tribes, and state and federal agencies. The letter explained the proposal, the environmental process, and how to participate.

BPA held a public scoping meeting to describe the Proposed Action and solicit comments. The public meeting was held in Pocatello, Idaho, on June 14, 2011. The public comment period began on May 27, 2011, and closed on July 14, 2011.

Comments received during the comment period, both written and oral, were considered in the environmental analysis of the Proposed Action. Comments received after the comment period ended were also considered in the environmental review. In addition, BPA created a web page specifically for the Proposed Action, with information about it and the EA process (see http://efw.bpa.gov/environmental_services/Document_Library/Springfield_Sockeye_Hatchery/).

The following comments were made during scoping. These topics have been addressed in appropriate sections in this EA.

- The proposed Springfield Sockeye Hatchery Project is not prudent without a Sockeye salmon recovery plan in place.
- Questions regarding whether proposed residences would be consistent with Bingham County land use zoning.

- Questions regarding whether use of the full water right for the property would adversely affect neighboring wells.
- Questions regarding how the proposed Springfield Sockeye Hatchery Project would affect water quality within Crystal Springs Pond, thereby affecting associated plant growth and waterfowl.
- Questions regarding the degree of collaboration with the Shoshone Bannock tribes.
- Questions regarding whether the Proposed Action would result in economic improvement within the area.
- Concern regarding whether global climate change is causing warming of water within the property.
- Concern regarding whether water quality within Boom Creek and Crystal Springs Pond would be maintained.

Chapter 2
Alternatives Description

This chapter describes the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed study. This chapter also provides a summary comparison between the Proposed Action and the No Action Alternative.

2.1. PROPOSED ACTION

The Proposed Action is for BPA to provide funding to IDFG for its proposed Springfield Sockeye Hatchery Project. Under the Springfield Sockeye Hatchery Project, IDFG would modify an existing hatchery to provide a facility capable of rearing up to 1 million Snake River sockeye salmon (*Oncorhynchus nerka*) ***juveniles*** to the ***full-term smolt*** stage of development for release in the Upper Salmon River Basin in Custer County and Blaine County, Idaho. The proposed hatchery site represents a major step forward in the Snake River Sockeye Captive Broodstock Program. Objectives for furthering this program and facilities necessary to achieve them are described in detail in the Master Plan (Idaho Department of Fish and Game 2010) and are not only those of IDFG, but also its long-time partner, NOAA Fisheries.

The Springfield Sockeye Hatchery Project would require demolition of several existing structures, construction of new hatchery facilities in the same footprint, and construction of three new residences to the northwest on the proposed hatchery site. New construction would include a containment and delivery system to supply water for hatchery operations. The proposed layout is shown in Figure 2-1.

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, 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

Demolition

The Proposed Action would require demolition of the existing concrete raceways (approximately 30,000 square feet), the original hatchery house (approximately 3,600 square feet), and a small shop (approximately 1,200 square feet) (Figure 2-3). The existing concrete raceways are currently in poor condition and are not serviceable. Although the existing shop is serviceable, the west wall is located on the property line and would be rebuilt to be located completely on IDFG property.

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Figure 2-1
Proposed Facilities Map

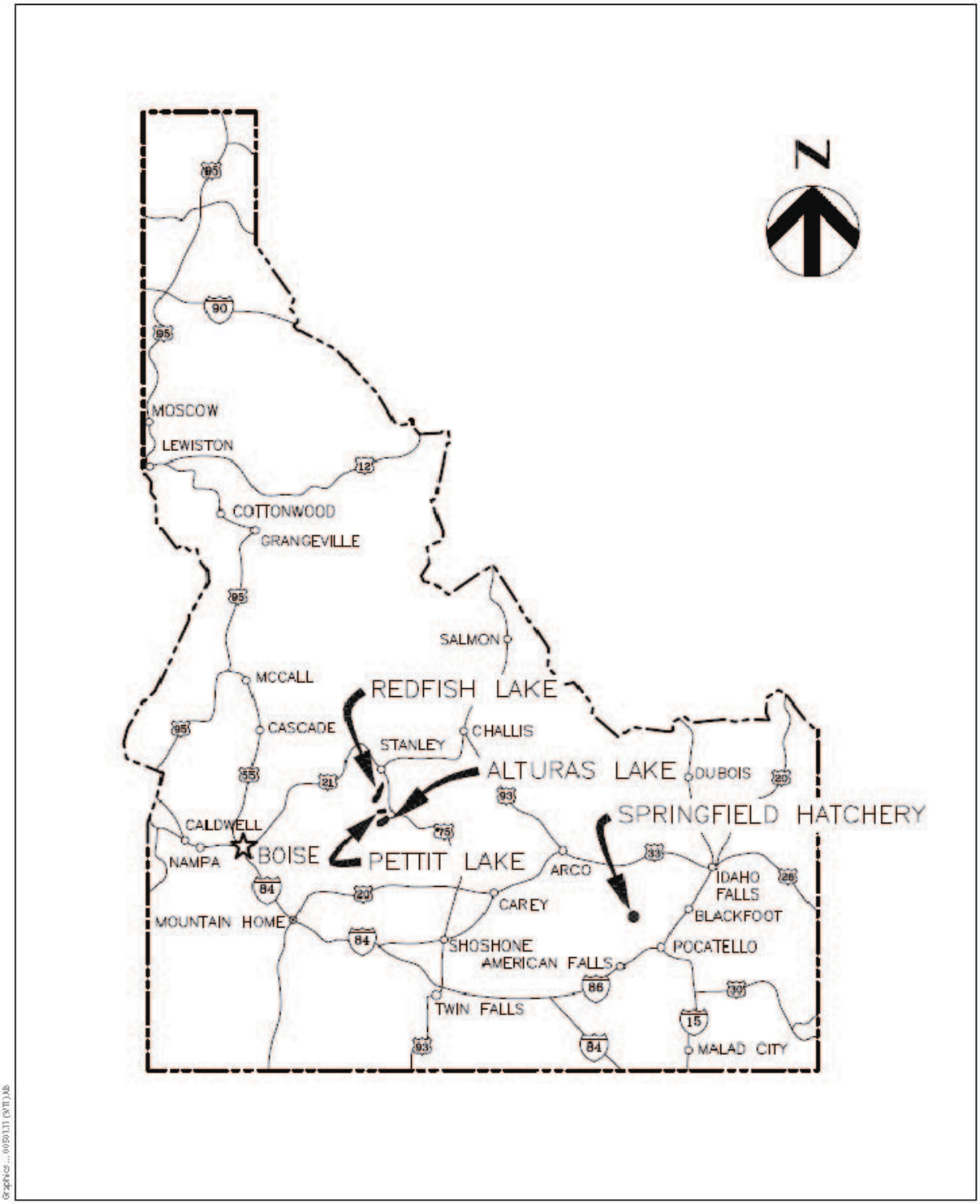


Figure 2-2
Proposed Outstocking Locations

Figure 2-3
Demolition Plan

To the extent possible, materials from the existing facilities, such as crushed concrete from existing raceways, would be salvaged and reused. Demolished materials from the existing buildings would be hauled away to the Power County Landfill or an appropriate recycling center near Pocatello, Idaho.

Construction of New Facilities

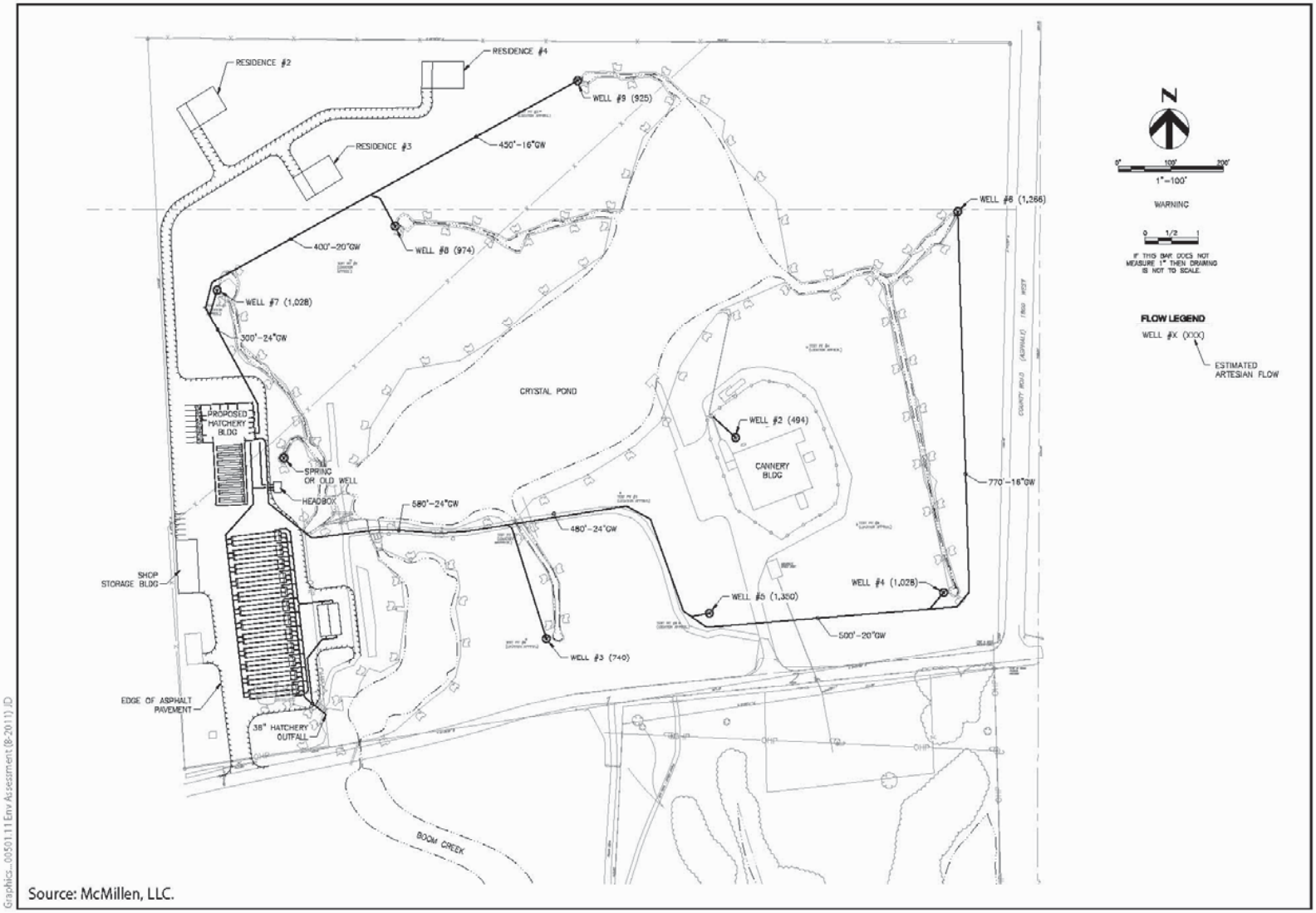
Several new facilities would be constructed to accommodate operation of the hatchery (Figure 2-4). The main facility would be a new hatchery building with offices, a lab, restrooms, chemical storage, incubation and early rearing tanks, mechanical/electrical rooms, and a chiller/degassing ***headbox*** room. The new hatchery building would be located just north of the existing facilities and would comprise approximately 13,600 square feet. Chemicals to be stored would include those used in operations such as ***iodophor***, ***formalin***, and antibiotics. The incubators would be configured in four tray stacks with ***isolation baffles*** in between each stack. The early rearing troughs would be located in a room adjacent to the incubation area and would consist of 18 troughs.

Outdoor facilities would include water supply well improvements, degassing headboxes, juvenile rearing raceways, and effluent treatment ponds. The rearing raceways would be located on the site of the existing raceways. It is estimated that 22 raceways would be required to meet the production goal of 1 million smolts at nine fish per pound. Two extra raceways are planned to provide some flexibility in fish-handling operations. The 24 raceways would be arranged in 12 pairs, with a 6-foot-wide aisle between each pair. The rearing area of each raceway would be 80 feet long and 8 feet wide, with an average water depth of 4 feet and a volume of 2,560 cubic feet. An 8- to 10-foot-long quiescent zone would be provided at the downstream end of each raceway to allow settleable solids to separate from the water column.

Wastes from the early and juvenile rearing facilities would be removed using a piped vacuum system that would convey the concentrated wastes (primarily fish feces and un-eaten feed), to a dual cell off-line settling pond. Each of the two settling pond cells would be approximately 15 feet wide by 40 feet long by 4 feet deep. This would provide capacity to treat the peak cleaning waste flow from the facility and would allow one cell to be dewatered and cleaned out without interrupting normal hatchery operations. The settling ponds would meet guidelines of the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency for confined animal feeding operations (40 CFR 122.24).

Three new residences would be constructed on the northern end of the property with new paved access roads to connect to the hatchery facilities. Access to the well heads would be provided by existing roads that would likely be graveled, but not widened. Some additional roadways may need to be constructed. These roadways would be 12 feet wide and may also be graveled.

Utility system and service improvements would also be completed as part of the Proposed Action. These improvements would include extension of power to the facilities via a new pad-mounted transformer and a three-phase underground electrical system. A diesel generator would provide standby power. Telephone and Internet service would be extended to the new hatchery building and residences. One of the existing ***artesian wells*** would be fitted with a medium pressure well pump and pressure tank system to meet domestic water demands.



Source: McMillen, LLC.

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Figure 2-4
Proposed Facilities

Wastewater would be treated by septic systems for each of the residences and hatchery. Runoff from the newly developed portions of project area would be directed into ***filter strips*** or ***bioswales*** for treatment before discharging into the existing surface drainage system.

Water Supply System

Water is currently supplied to the existing hatchery via nine artesian wells. A 50-cubic-feet-per-second (cfs) water right was perfected by the former trout hatchery and would be used for the sockeye hatchery. Under the Proposed Action, water would be supplied for proposed hatchery operations primarily by gravity flow. During peak months (November through April), up to four of the highest producing wells likely would need to be pumped to meet water supply demand.

Plumbing improvements would be made at each of the nine wells. ***Low head***, high-volume pumps would be installed at up to six of the existing wells. Four of the pumps would supply normal duty peak demand with the two remaining pumps for standby duty. Each pump would have a preliminary design point of approximately 3,200 gallons per minute, at 60 feet of total ***dynamic head***. Each pump (two total) would be connected to an emergency generator to reduce the risk of interruptions to the hatchery water supply. When not in use, the wells would continue to supply flow via the existing channels to Crystal Springs Pond.

Construction of a piping system (Figure 2-2) would convey groundwater to the hatchery. This system would ensure that high-quality groundwater was provided to minimize the risk of disease from surface waters.

Hatchery Operations and Effluent Treatment

Eyed eggs would be delivered to the hatchery each November. The eggs would be disinfected with iodophor in small batches and then loaded into incubator trays. Excess iodophor would be disposed of by land application or stored in a pump-out tank for periodic remote disposal.

Because of concerns about diseases transmission, the incubators would be configured in four tray stacks with isolation baffles in between each stack. Pathogen-free groundwater would be provided at a flow rate of 4 to 5 gallons per minute (gpm) to each stack. Both chilled and ambient groundwater supplies would be provided at each incubator. Overflow water from the incubators would fall through gratings into the floor trenches that convey the water into the hatchery drain system. Adequate dilution flow would be maintained through the hatchery drain system to avoid exceeding chemical concentration limits at the hatchery outfall.

Beginning in February, ***swim up fry*** would be transferred from the incubator into early rearing troughs located in an adjacent room. In late May or early June, sockeye juveniles would be transferred into the large outdoor rearing raceways. Up to 540 gpm of groundwater would be supplied to the upstream end of each raceway. The overflow drain from each raceway would be piped into a common drain that would discharge into the wetland that forms the headwaters of Boom Creek. Discharge from the trout facilities was factored into the 2006 total maximum daily load (TMDL) allocations established for the American Falls Subbasin Assessment (IDEQ et al. 2006). A new TMDL would be in place for Springfield Hatchery prior to operation allocating a maximum loading of 347 tons annually of suspended sediment, and 1.63 tons per year phosphorous.

A separate cleaning waste vacuum piping system would be used to collect settled solids for each raceway and convey the concentrated wastes to an off-line settling pond. As described above, the settling ponds would be designed to meet guidelines of the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency for confined animal feeding operations (40 CFR 122.24).

Once fish reached maturity, they would be released into Redfish, Pettit, and Alturas lakes and the associated outflow streams. 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.

Recreational Use of Crystal Springs Pond

The 4-acre public fishing pond at Crystal Springs Pond (and associated public access areas/outhouse) would continue to be maintained with IDFG funds as addressed in current land purchase agreements. Under the Proposed Action, IDFG would continue to monitor water quality in the pond to ensure the recreational use would continue.

2.1.2. Construction Activities

The majority of the construction would be isolated to existing (disturbed) areas; the exception would be the construction of the three residences in the northwest area of the proposed hatchery site. Construction would begin in spring 2012 and continue for approximately 16 months.

Construction equipment would include the use of excavators, dozers, heavy trucks tractors, and backhoes for demolition. Construction would involve use of equipment such as cranes, trenchers, loaders, cement mixers, and pavers. Staging areas would be located in previously disturbed areas, and vegetation within temporarily disturbed areas would be restored.

2.2. NO ACTION ALTERNATIVE

Under the No Action Alternative, IDFG would continue to operate the Snake River Sockeye Program without supplementing fish production at the Springfield Hatchery. Currently, broodstock is collected at a 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. Fish are produced at Eagle Fish Hatchery (Ada County, Idaho), Sawtooth Fish Hatchery (Custer County, Idaho), Manchester Research Station (Kitsap County, Washington), Burley Creek Fish Hatchery (Kitsap County, Washington), and Oxbow Fish Hatchery (Multnomah County, Oregon).

Fish are released in May of each year. This typically requires approximately 30 truck trips over a 2-week period. Smolts are released to the following locations.

- 50,000 eyed-eggs planted in egg boxes in Pettit Lake
- 100,000 pre-smolts planted in Redfish, Alturas, and Pettit Lakes (combined release)

- 150,000 smolts planted at the outlet of Redfish Lake and in the Salmon River upstream of the Sawtooth Hatchery
- 400 full-term captive brood hatchery adults planted in primarily Redfish Lake

IDFG would continue to maintain the aging, non-functional aquaculture facility and have a caretaker on site, but no improvements would be implemented. The shop currently located on the property line would also remain. Failure to repair and/or modify the existing structures likely would result in the loss of the associated water rights for the property because well modifications and infrastructure improvements are required to put existing water rights to beneficial use. Crystal Springs Pond and its associated public access areas and outhouse would continue to be maintained with IDFG funds as addressed in current land purchase agreements.

2.3. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

IDFG has worked closely with BPA over the past several years to identify a suitable location for a facility capable of producing up to 1 million full-term sockeye salmon smolts annually. The target for between 500,000 and 1 million smolts has been established for in the basin-wide guidance documents (FCRPS Biological Opinion, Idaho Fish Accords). Production of a smaller number of fish at Springfield would take longer to achieve recovery goals set forth in these documents and would not substantially reduce environmental impacts associated with the proposed hatchery operations. For these reasons, no alternatives to produce fewer fish were considered further in this document.

Site-selection criteria included specific biological, environmental, and infrastructure requirements considered to be paramount to the successful culture of sockeye salmon. These criteria included water quantity, water temperature, and water source/quality considerations. Additionally, property size, geography, accessibility, proximity to the Stanley Basin, and suitability for capital investments were considered.

The results of an initial site review completed in 2008 identified potential candidates in the Lost River Trout Hatchery near Mackay, Idaho; the Springfield Hatchery; and the Crystal Springs Hatchery near American Falls, Idaho. Magic Valley hatchery locations were considered but ruled out primarily as a result of high water temperatures and steelhead rearing commitments. The Lost River Trout Hatchery was found to be the most suitable location; however, attempts to secure the Lost River site failed in 2009 when the property was purchased as a result of a prior ***Right of First Refusal*** contract held with a private party. Since that time, IDFG has continued to investigate alternative properties that would meet the specific biological, environmental, and infrastructure needs of this program. As a result of this continuing investigation, IDFG and BPA continued to evaluate four hatchery locations as candidates. These included:

- American Falls State Fish Hatchery, American Falls, Idaho;
- Grace State Fish Hatchery, Grace, Idaho;
- Mackay State Fish Hatchery, Mackay Idaho; and
- Springfield Hatchery, Springfield, Idaho.

Both the American Falls State Fish Hatchery and Grace State Fish Hatchery were eliminated from further consideration because both facilities had higher than desirable water temperatures that would require costly water chilling. In addition, the property at the American Falls State Fish Hatchery was insufficient to support the proposed new sockeye salmon smolt production facility.

Both the Mackay State Fish Hatchery and the Springfield Hatchery were determined to have desirable water temperature profiles and ample water rights to rear juvenile sockeye salmon. Although the Mackay State Fish Hatchery is located slightly closer to the Stanley Basin, it is currently operated at or near production capacity and represents a significant portion of IDFG's resident species rearing capability. Selection of the Mackay State Fish Hatchery would have resulted in unacceptable interruptions to production and would also have required reprogramming for use as a sockeye salmon smolt rearing facility. The time and cost to update the Springfield Hatchery to accept production transferred from the Mackay State Fish Hatchery likely would exceed the costs of directly developing the Springfield Hatchery as a sockeye smolt rearing facility. For these reasons, development of the Springfield Hatchery was selected as the location for the Proposed Action and none of the alternative locations were carried forward for further analysis. (Schriever pers. comm.)

2.4. COMPARISON OF ALTERNATIVES

Table 2-1 compares how well the alternatives meet the project purpose as defined in Chapter 1, Purpose of and Need for Action. Detailed analysis of the environmental impacts is presented in Chapter 3.

Table 2-1. Comparison of How the Proposed Action and No Action Alternative Respond to the Project Purpose

Purpose	Proposed Action	No Action Alternative
Better achieve production objectives from the 2008 FCRPS Biological Opinion	The Proposed Action would substantially contribute to the production objectives of the 2008 FCRPS Biological Opinion by providing an operating a facility capable of rearing 1 million Sockeye salmon smolts. Production of this amount would be required to reach an average adult ***escapement*** of 2,000 fish over two generations.	The No Action Alternative would not contribute to any increases in Sockeye salmon production above existing conditions because supplementation of natural populations would continue at current levels. As a result, it would take longer to achieve the production objectives set forth in the 2008 FCRPS Biological Opinion.
Satisfy commitments made in the Idaho Fish Accords	The Proposed Action is one of the projects specifically committed to by BPA in the Idaho Fish Accords. Specifically, the Proposed Action would satisfy the call to produce between 500,000 and 1 million sockeye smolts annually.	The No Action Alternative would not be consistent with the commitments made in the Idaho Fish Accords because it would not result in increased production of sockeye salmon as called for by the Idaho Fish Accords.

Purpose	Proposed Action	No Action Alternative
Maintain long-term fitness of the target species and minimize effects on non-target species	The Proposed Action would contribute to maintaining the long-term fitness of Sockeye salmon by increasing species numbers while minimizing adverse impacts on non-target species. The Proposed Action would contribute to long-term fitness of sockeye by enabling the production of up to 1 million smolts to supplement natural populations with the goal of achieving an average adult escapement of 2,000 fish over two generations. As indicated further in the analysis presented in Chapter 3, Affected Environment, Environmental Consequences, and Mitigation Measures, construction and operation of the proposed hatchery would have primarily low impacts on other environmental resources, including non-target species, through implementation of BMPs and the mitigation measures listed in Chapter 3. For example, hatchery operations, including ongoing broodstock collection would be conducted in a manner to minimize adverse impacts on other fish species.	The No Action Alternative would not result in any adverse impacts on non-target species, but would also not contribute to long-term fitness of Sockeye salmon. The ongoing Snake River Sockeye Captive Broodstock Program would continue; however, additional supplementation of natural populations would not occur. Therefore, the No Action Alternative would not contribute to long-term population fitness compared with the Proposed Action.

Chapter 3
Affected Environment, Environmental Consequences, and Mitigation Measures

3.1. INTRODUCTION

This chapter evaluates the potential impacts of the Proposed Action Alternative and No Action Alternative on human and natural resources to determine whether either alternative has the potential to cause significant environmental effects. For each resource, the chapter describes the existing environment that could be affected by the alternatives, the potential environmental impacts of the alternatives, and ***mitigation***.

Four impact levels were used—high, moderate, low, and no impact to describe impacts from construction and operation and maintenance activities. High impacts are considered to be significant impacts. Typically, low impacts can be largely mitigated. Moderate impacts can usually be partially mitigated.

Cumulative impacts are also evaluated. Cumulative impacts are impacts that could occur when considered in addition to other past, present, and reasonably foreseeable future actions. Other such actions in the project vicinity that are considered in the cumulative impact analysis, including actions being conducted or proposed by IDFG in addition to the proposed hatchery, are identified and discussed in Appendix A.

Impacts of the No Action Alternative are discussed in each resource section. Table 3.1-1 summarizes the impacts for the Proposed Action and the No Action Alternative. This table represents the level of impact that would be expected to result after implementation of appropriate mitigation, listed in each resource section.

Table 3.1-1. Summary of Potential Impacts of the Proposed Action and No Action Alternative

Environmental Resource	Proposed Action	No Action Alternative
Land Use and Recreation	During construction, recreational uses at Crystal Springs Pond may be temporarily disrupted causing some recreationists to relocate to other areas of the pond or to leave entirely. These impacts would be temporary, would vary in magnitude, and would be **low to moderate** depending on the extent and duration of the disruption. During operation, IDFG would monitor water quality in Crystal Springs Pond to ensure water quality is maintained for recreational fishing. Impacts on water quality at American Falls Reservoir would also be **low** because the hatchery	No improvements to the existing facilities would occur, but some maintenance activities would result in **low and temporary** impacts on land use and recreation, including localized noise and dust, a slight traffic increase, and some disruption of recreation activities similar in nature to those described for the Proposed Action. However, the extent and degree of the impacts would be less than those under the Proposed Action. Outstocking activities would also continue to occur over a period of a few

Environmental Resource	Proposed Action	No Action Alternative
	discharge would be required to comply with the terms of the NPDES permit and would not noticeably affect recreational uses of these waters. Implementation of the Proposed Action would be consistent with surrounding land uses, applicable land use plans, and zoning, and would not result in any substantial, long-term impacts on adjacent land uses. Land use impacts would be **low**. Outstocking activities would occur over a period of a few weeks each year and would not represent a significant disruption to existing recreational opportunities in Redfish, Pettit, and Alturas lakes. Over time, it would be expected that stocked fish would survive and increase populations to the point where fish that return to spawn in these areas could represent additional recreational fishing opportunities within these lakes. Although beneficial, these impacts would be **low**.	weeks in the spring of each year and would not represent a significant disruption to existing recreational opportunities at the outstocking locations.
Visual Resources	During construction, visual changes associated with construction equipment and activity would be **low**. However, because construction associated with the water supply improvements would represent a temporary increase in noise and would disrupt the scenic quality at Crystal Springs Pond, construction impacts on recreationists would be **moderate**. Permanent visual changes would be associated with the proposed hatchery, located primarily on the site of existing facilities, and the three new residences to be located in the northwest corner of the proposed hatchery site. Visual impacts would be **low** either because the visual changes would be minor or would largely not be visible to sensitive viewers.	No improvements would be made under the No Action Alternative. Facilities not being used, such as the concrete raceways, would continue to degrade. Minor sources of lighting associated with the existing residence would continue to be used. Therefore, there would be some **low** visual impacts associated with the No Action Alternative.

Environmental Resource	Proposed Action	No Action Alternative
Vegetation	Permanent and temporary direct impacts would mostly affect two vegetation communities: disturbed grassland areas and developed/disturbed lands. Although the Proposed Action has the potential to directly affect native plant communities, these impacts would primarily be temporary and limited so the direct impacts on vegetation of the Proposed Action would be **low**. Because vegetation in the study area is already largely disturbed and measures would be taken to reduce the spread of noxious weeds and reduce erosion and sedimentation, the potential indirect impacts of the Proposed Action would be **low**. No rare, threatened, and endangered plant species were identified in the study area. Potential impacts could range from **low to high** depending on the extent of the disturbance or impact. **High** impacts could occur if individual plants were crushed or killed. Potential impacts that indirectly affect these species, or that can largely be mitigated, would range from **low to moderate**, depending on the extent of the disturbance and the ability to adequately mitigate.	There would be no impacts associated with construction of the new facilities or improvements to the existing facilities. Similar to existing conditions, there would be some **low** impacts on vegetation associated with maintenance activities including ongoing weed management.
Water Quality and Water Quantity	Implementation of the proposed mitigation measures and BMPs would ensure potential impacts on surface water and groundwater quality from construction would be **low**. The potential for water quantity impacts on Crystal Springs Pond would also be **low** because water use at the hatchery would be modified to provide more flow through to the pond if deemed necessary. The proposed hatchery would be managed to minimize and control disease outbreaks and would not discharge to waters that support ESA-listed anadromous salmonids. Therefore, there would be **no impact** on water quality.	Some water quality impacts would occur as a result of maintaining the recreational and existing hatchery facilities. There would be **low** effects on groundwater because it is assumed the water rights would be lost if no infrastructure improvements are made. Some minimal use of groundwater would continue at the onsite residence and for maintenance activities.

Environmental Resource	Proposed Action	No Action Alternative
	Increased groundwater withdrawal from pumping would have a **low** impact on groundwater because the drawdown would be localized, and the ***aquifer*** would recharge after the cessation of pumping each year (SPF Water Engineering 2010). Similarly, cumulative effects on groundwater would be **low** because the drawdown would be localized and would not result in permanent measurable effects on the aquifer because of high ***transmissivity*** and relatively low water demand given the size of the aquifer.	
Wetlands	The Proposed Action would result in up to 0.91 acre of permanent wetland loss and 0.24 acre of temporary disturbance. Implementation of the measures required in Section 404 Clean Water Act permit would ensure that wetland impacts would be **low**. Indirect impacts on wetlands could occur through sedimentation and erosion from construction activities or through damage to vegetated buffers along wetlands, including increased risk of spreading noxious weeds. Because disturbance to wetland buffers from construction activities would be minimized through BMPs and mitigation measures and temporary, the indirect impacts on wetlands and wetland buffers would be **low**. IDFG would also monitor and maintain water quality in Crystal Springs Pond by managing a certain inflow of water into the pond. However, some amount of water may be lost and could result in loss of wetlands within the stream channels and around the edges of the pond. Depending on the extent of these impacts, the impacts on wetlands would be **low to moderate**.	There could be minimal and temporary impacts on wetlands under the No Action alternative associated with maintenance activities. These impacts would be similar in nature to those under the Proposed Action and would also be **low**.

Environmental Resource	Proposed Action	No Action Alternative
Floodplains	There would be **no** impacts on floodplains associated with construction activities or the placement of new structures in a designated floodplain.	There would be **no** impacts on floodplains and no increased risk of flooding associated with the No Action Alternative.
Geology and Soils	Because the appropriate seismic criteria would be incorporated into the design and subject to design review and permitting by Bingham County, impacts from seismic ground shaking would be **low**. During construction, direct impacts on geology and soils could occur as a result of direct soil disturbance, leading to loss of soils and increased sedimentation. Indirect impacts on geology and soils could occur as a result of temporary vegetation removal and grading that could lead to increased erosion over time. With the implementation of BMPs that would be implemented as a requirement of the NPDES permit, impacts on soils and geology would be **low**. The proposed hatchery office building and the onsite residences would be located on loamy soils, which are of limited use for septic systems. With the implementation of proper design considerations, the potential impact would be **low**.	Because no improvements would be made to the existing structures, they would continue to degrade over time and represent a potential risk of exposure to seismic hazards. There could be some low impacts on geology and soils associated with maintenance activities, which would be similar in nature to those under the Proposed Action; however, the extent of the disturbance would be less because there would be no construction associated with the proposed residences or improvements to existing facilities.
Fish and Wildlife	The overall potential for impacts on fish and wildlife from construction noise and increased human presence would be **low**, temporary, and limited to the construction area and immediately adjacent habitats. The Proposed Action is expected to have **no impact** on competition for space and prey for any of the salmonid species in the Salmon, Snake, and Columbia rivers. Also, impacts of the Proposed Action on ESA-listed fish species would be **low** and beneficial for those species that prey on Sockeye salmon. Potential impacts associated with genetic interactions would be **low** through the implementation of the Draft Genetic Hatchery Management Plan.	Sockeye salmon recovery could be slower under the No Action Alternative because supplementation of existing populations would occur at current levels. Additional time would likely be required to plan and permit a replacement hatchery. The No Action Alternative would have **low** potential impacts on fish and wildlife limited to minor disturbance from recreational use and periodic maintenance activities**.**

Environmental Resource	Proposed Action	No Action Alternative
	Human activities, noise, and traffic associated with operation of the proposed hatchery would result in **low** impacts on wildlife. Some temporary wildlife displacement could occur during high activity periods, such as during spring smolt outstocking.	
Cultural Resources	No known resources eligible for listing the National Register of Historic Places (NRHP) are located within the project area. Based on the inventories conducted, the likelihood of encountering additional unknown cultural sites is low. Therefore, the potential impacts on cultural resources would be low.	There would be **no impacts** on cultural resources under the No Action Alternative because there would be no ground disturbance associated with ongoing activities currently taking place at the hatchery.
Transportation	The temporary increase in construction-related traffic on adjacent roadways would represent a minor increase in daily traffic volume compared with existing roadway use and is not expected to substantially degrade traffic operations on the local roads. Therefore, transportation impacts during construction would be **low**. Because of the limited number of the trips (about 40 trips annually) for transporting smolts to the outstocking locations and the relatively higher volume of traffic on area highways, operational traffic impacts would be **low**. Because there is capacity to accommodate additional traffic in the area and because the additional trips for transporting commuters to/from the proposed hatchery site and waste from the office and residences would be minimal, transportation impacts during operations would also be **low**.	Under the No Action Alternative, outstocking under the current Snake River Captive Broodstock Program would continue, requiring approximately 30 truck trips annually each spring. Compared with the relatively higher traffic volume of traffic on the area highways, these impacts would be **low**. Some very minor traffic to and from the proposed hatchery site would continue, and thus, impacts on transportation would be **low**. There would be **no** impacts on transportation associated with improvements of the existing facilities.
Noise and Public Health and Safety	It is unlikely the temporary construction noise would be discernible at the closest off-site residences. As a result, noise impacts on residents would be **low**. Construction noise levels during pipeline trenching activity along the south shoreline of Crystal Springs Pond	There would be no noise or public health and safety impacts under the No Action Alternative associated with construction. Minor noise and slight exposure to hazardous materials would continue from ongoing maintenance, which could result in low impacts on noise and public health and safety.

Environmental Resource	Proposed Action	No Action Alternative
	would be noticeably elevated above existing conditions and potentially disruptive to recreational fishermen; however, these impacts would be temporary and limited to localized areas near the trenching activity. Therefore, the temporary noise impacts on recreationists during construction would be **low to moderate** depending on the location and the extent of the disturbance. Proposed Action-related truck traffic volumes on public roads close to existing residences would be a small fraction of the background traffic volumes, so the Proposed Action would cause only a small increase in roadway noise. Therefore, the permanent noise impacts during operation would be **low**. After implementing a Stormwater Pollution Prevention Plan and a Spill Control, Containment and Countermeasures Plan, the public health and safety risk from exposure from spills would be **low**.	
Socioeconomics and Environmental Justice	Because construction activities associated with the Proposed Action would occur in phases over approximately 16 months, it is not anticipated that the duration of construction work would be long enough to induce any permanent changes to population in the study area; impacts on population and housing would be low. The direct and indirect expenditures from construction of the Proposed Action would represent a small proportion of the total annual income in the study area, and the impact would be temporary and **low**. The Proposed Action may generate a small increase in sales tax revenue to the state from purchases by construction and hatchery workers, which would be a **low** impact	Because there would be no improvements made under the No Action Alternative, there would be **no** impact on population and housing or government tax revenue. The caretaker would continue to live on site and maintain the property, but no additional jobs would be created. Therefore, the socioeconomic impacts would be **low**. Ongoing operation and maintenance activities would likely result in **low** socioeconomic impacts and **low** impacts related to environmental justice, which would not disproportionately affect environmental justice populations.

Environmental Resource	Proposed Action	No Action Alternative
	During operation, the increase in employment would not have a discernable long-term effect on the labor market in the study area, but would represent a positive impact for those people who receive jobs. The potential for this impact, while beneficial, would be **low**. To the extent that the increased fish populations improve the long-term health and resilience of Idaho's Snake River Sockeye runs, the Proposed Action could improve the economic wellbeing of people who care about their continued survival. While the socioeconomic impacts would be beneficial, they would be **low**. Operation of the Proposed Action would be equally borne by all individuals within the surrounding area and would not disproportionately affect ***environmental justice populations***. In addition, the Shoshone Bannock tribes would benefit from the increased production of fish.	
Public Facilities and Energy	There would be a low likelihood for construction activities to result in increases in demand for local law enforcement and emergency service providers and would be within the abilities of these service providers to respond. Potential impacts on emergency service response would be **low**. Local landfill sites and transfer stations are currently not at capacity and would be able to handle additional waste. Therefore, impacts from waste disposal would be **low**. Potable water would be provided via one of the existing artesian wells consistent with IDFG's water right. Sewage associated with the proposed hatchery would be treated via onsite treatment and disposal systems. Water treatment associated with proposed hatchery effluent would be treated on site prior to	Some operation and maintenance activities could result in **low** impacts on public facilities and services, similar to the potential impacts that would occur under the Proposed Action. Energy use would continue similar to existing conditions and would be met by existing energy supplies; thus, the impacts on public facilities and energy would be **low**.

Environmental Resource	Proposed Action	No Action Alternative
	discharge. Potential impacts on the provision of services associated with water supply and water treatment would be **low**. Energy consumption would be **low** compared with existing supply and would be further reduced through the implementation of energy-reducing measures.	
Air Quality	Air quality impacts would be **low** because construction emissions would be temporary and occur in localized areas. Operational emissions would also be relatively small compared with current emissions levels, and the project area is in compliance with the National Ambient Air Quality Standards. Small amounts of organic, potentially odorous wastes would be generated during operation of the proposed hatchery. The closest neighboring homes are roughly 2,000 feet from the proposed hatchery, so odor impacts during operation would likely be **low**. The forecast long-term greenhouse gas (GHG) emissions from the Proposed Action (including initial "soil carbon" emissions from ground disturbance, initial construction activity, long-term operational activity, and indirect emissions from electricity purchases) are only a small fraction of the Council on Environmental Quality's (CEQ) evaluation threshold (25,000 tons per year of CO_2e). Therefore, the potential impacts on GHG emissions, worldwide GHG concentrations, and climate change are considered to be **low**. Because the proposed hatchery has feasible options to compensate for potential future decreases in water supply caused by climate change, the potential impacts of future climate change on the Proposed Action are considered **low**.	Under the No Action Alternative, there would be no emissions associated with the improvement of existing facilities. Ongoing maintenance activities would continue and would result in **low** air quality impacts. There would be no construction-related GHG emissions under the No Action Alternative. Some minor emissions related to ongoing maintenance activities would continue, but the overall contribution to climate changes would be **low**.

3.2. LAND USE AND RECREATION

3.2.1. Affected Environment

The study area for land use and recreation includes the area within a 0.25-mile radius of the proposed hatchery site and the outstocking locations, which includes Redfish, Pettit, and Alturas lakes and their associated outfalls.

Land Use

Agriculture is Bingham County's dominant land use. About 32% of land is agricultural use, 47% is rangeland, and 15% of the land is in barren land use (Bingham County 2005). Forest land and urban land represent only a small percentage of the County's total land area.

Currently, the proposed hatchery site is zoned for heavy manufacturing and has historically been operated as a trout hatchery with an associated cannery facility. Although the hatchery is not in operation, one residence exists and is occupied by an IDFG caretaker. In addition, IDFG maintains recreational fishing on site at Crystal Springs Pond. The remaining land in the land use study area is zoned for agriculture. Nearby there are some private residences also on agriculturally zoned land.

Recreation

Recreational areas are located throughout the study area. In general, there are several county and local parks, undeveloped campgrounds, and picnic areas, within Bingham County.

Crystal Springs Pond
Adjacent to the existing hatchery is the 4-acre public fishing site known as the Crystal Springs Pond (Figure 1-1). The pond is supplied by artesian flows from the existing wells, from shallow groundwater, and to a lesser extent by surface water runoff. IDFG periodically stocks the pond with rainbow trout. Visitors also use the pond and surrounding area for floating, swimming, picnicking, bird watching, and other outdoor recreation activities. Data are unavailable to estimate the number of visitors to Crystal Springs Pond each year.

American Falls Reservoir

Downstream from Crystal Springs Pond is American Falls Reservoir, formed by American Falls Dam (a Bureau of Reclamation facility). When full, this 56,000-acre reservoir is the largest on the Snake River. It offers a variety of recreational opportunities, including swimming, boating, fishing, camping, water sports, and wildlife viewing (National Recreation Reserve Service 2011).

Redfish, Pettit, and Alturas Lakes

Redfish Lake is located in Custer County. This lake offers numerous recreational opportunities, including boating, fishing, horseback riding, swimming, mountain climbing, and hiking. Public and private facilities around the lake offer lodging, outfitting, food, and rental services.

Pettit and Alturas lakes are located in Blaine County. These lakes provide recreational opportunities including camping, hiking, boating, fishing, and swimming.

3.2.2. Environmental Consequences—Proposed Action

Land Use

The proposed hatchery facility and continued recreational use of Crystal Springs Pond would be a ***conforming use*** under Bingham County's zoning ordinance with the existing heavy industrial zoning of the proposed hatchery site (Jensen and Davis pers. comm.). Although the existing residence is allowed and would not require further county permits, IDFG would be required to obtain the appropriate permits to allow construction of the proposed residences within a heavy manufacturing zone, as indicated in the mitigation measures described below. Bingham County is currently updating its zoning code. This process would have no direct effect on the Proposed Action. Therefore, there would likely be no impacts associated with land use consistency.

The Proposed Action is also unlikely to affect existing land uses in the study area, and would not result in the conversion of current land uses to other uses. Although there may be minor traffic disruptions associated primarily with construction, there would be no direct loss or conversion of agricultural lands or disruption to residents associated with the Proposed Action.

In addition, pumping during the winter months to accommodate peak demand would result in a localized decrease in the ***hydraulic head*** in the vicinity of the wells to between 30 and 40 feet below ground surface. However, as discussed in Section 3.5, Water Quality and Water Quantity, the Proposed Action is not expected to have a noticeable long-term effect on the underlying ***aquifer*** because the aquifer would recharge during the remaining months of the year when pumping does not occur. ***Artesian flows*** to the wells would also be restored once pumping has stopped (SPF Water Engineering 2010). This is not anticipated to affect irrigation practices because the drawdown would last only during the period of pumping, would be limited to the vicinity of the wells, and would occur during the winter months when irrigation is not typically occurring. Therefore, there would be no impacts associated with conflicts to existing land uses. Potential impacts associated with recreational uses are discussed in greater detail below.

Recreation

Crystal Springs Pond

During construction, recreational uses at Crystal Springs Pond may be temporarily disrupted by noise, construction traffic, or dust. These impacts could adversely affect the quality of recreation and cause some users to relocate to other areas of the pond or to leave the facility entirely. These impacts would be temporary, would vary in magnitude during the 16-month period of construction and would be low to moderate depending on the extent and duration of the disruption.

During operation, the Proposed Action would divert artesian flows that currently supply Crystal Springs Pond for use in the proposed hatchery. As discussed in Section 3.5, Water Quality and Water Quantity, there is a potential for the Proposed Action to affect water quality and quantity in Crystal Springs Pond. Because there also appears to be upwelling spring flow entering the pond (probably from a separate shallower aquifer), this reduction in flow may be adequately

mitigated. Regardless, as part of the Proposed Action, IDFG would monitor water quality and quantity in Crystal Springs Pond and ensure adequate water quality is maintained for fishing. Potential operational impacts on recreation at Crystal Springs Pond would be low.

American Falls Reservoir

Construction and operation of the Proposed Action could affect water quality downstream of the proposed hatchery site as discussed in greater detail in Section 3.5, Water Quality and Water Quantity. As indicated in that analysis, BMPs and mitigation would ensure potential construction-related impacts on water quality would be low. In addition, effluent from hatchery operations would be treated appropriately before being discharged to Boom Creek, which runs from the hatchery into American Falls Reservoir. Because hatchery effluent would be required to meet NPDES permit requirements and operation would be required to be within existing TMDL waste load allocations, discharge of treated effluent would not have an adverse effect on recreational uses in American Falls Reservoir as a result of the Proposed Action.

Redfish, Pettit, and Alturas Lakes

Outstocking activities would occur over a period of a few weeks each year and would not represent a major disruption to existing recreational opportunities in Redfish, Pettit, and Alturas lakes. Over time, it would be expected that stocked fish would survive and increase populations to the point where fish that return to spawn in these areas could represent additional recreational fishing opportunities within these lakes. Although the increase in the number of Sockeye salmon would result in a beneficial impact on recreational fisheries, the effect would be low.

3.2.3. Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG would implement the following mitigation measures to avoid or minimize impacts on land use and recreation.

- Obtain appropriate permits from Bingham County to allow for new residences to be constructed in a heavy manufacturing zone.
- Develop and distribute a schedule of construction activities to potentially affected landowners near the construction site to inform residents when they may be affected by construction activities; advertise the construction schedule in local newspapers and post it in public places, those customarily used for public notices, such as libraries, post offices, and local government buildings, and also at Crystal Springs Pond to inform recreationists of construction activities.
- Conduct a preconstruction public meeting and invite landowners to meet with contractors and IDFG staff responsible for project implementation to receive information and discuss concerns.
- Provide appropriate contact information for contractor liaisons and IDFG staff to local residents for any concerns or complaints during construction.

3.2.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

During construction, potential unavoidable impacts would consist of minor increases in local traffic in the project vicinity, short-term generation of noise and dust in or near residential or recreation areas, and possibly short-term interference with agricultural activities, such as disruption of farm equipment traveling on local roadways or conflicts with construction-related traffic. These short-term impacts would cease once construction is completed and are considered low.

3.2.5. Cumulative Impacts—Proposed Action

Other activities in the study area, including the Fort Hall Habitat Restoration project, Salmon River Habitat Restoration project, the Crystal Springs Hatchery project, and agricultural activities, have resulted in impacts on land use and recreation in the respective study areas, such as the conversion of existing land uses. Because the impacts of the Proposed Action on land use and recreation would be low, the Proposed Action would not measurably contribute to a cumulative impact on land use or recreation.

As discussed in Section 3.5, Water Quality and Water Quantity, groundwater levels in the ESPA have been historically declining and could continue to decline by up to 15 feet over the next 20 years independent of the Proposed Action (SPF Water Engineering 2010). This decline would likely occur as a result of climatic change and increased irrigation efficiency (SPF Water Engineering 2010). In the event the aquifer levels decline, some additional pumping at the hatchery during non-peak periods of hatchery water demand (May through December) may be needed. However, modeling has shown that, under these future conditions, all but one well could be closed off to limit the artesian flow, which would provide an adequate pressure to supply water to the hatchery during the low-demand summer months without additional pumping (SPF Water Engineering 2010). Therefore, it is not anticipated the Proposed Action would contribute to a cumulative impact on the surrounding land uses, including the ability for adjacent landowners to use groundwater for irrigation.

3.2.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, no improvements to the existing hatchery would be made; the existing facilities would remain in their current state. Maintenance activities would continue to result in low and temporary impacts on land use and recreation, including very limited localized noise and dust; slight traffic increases, primarily associated with outstocking trips occurring during the spring of each year from the existing Snake River Sockeye Broodstock Collection Program; and minor disruption of existing land uses, similar to the impacts described above.

3.3. VISUAL RESOURCES

3.3.1 Affected Environment

The study area for visual resources includes the vicinity of the proposed hatchery site, land within 0.25 mile of the proposed hatchery site, and surrounding areas (including roadways) with views of the proposed hatchery.

Visual Setting

The study area is located north of American Falls Reservoir in eastern Idaho. Land uses in and around the study area are primarily agricultural and rural residential. The surrounding area includes distant views of the mountain and foothills, but the immediate views closer to the project area are primarily of flat agricultural land. There are a few scattered buildings, mostly associated with farm operations and the existing hatchery.

Much of the existing hatchery site is open space grown over with various grasses and shrubs, and several stands of Russian olive trees. The existing hatchery buildings include an office/hatchery building, a small shop, a cannery/processing plant with offices, a feed-storage silo, and a single-family residence. The existing facilities also include concrete raceways, which are primarily located below ground and contain weedy species.

The main visual resource in the study area is Crystal Springs Pond, a 4-acre public fishing pond maintained by IDFG for recreational fishing. There is a public parking area and access trail to the pond immediately west of the former cannery building. There are no scenic byways or designated vistas in the study area.

Sensitive Viewers

Sensitive viewer groups in the study area include motorists driving by the project area, residents with views of the project area, and recreationalists at the Crystal Springs Pond. Typical views experienced by these sensitive viewer groups are discussed in greater detail below.

The nearest roads to the project area include Edwards Road (to the south) and Judge Road (to the east). The existing office/hatchery building and the cannery/processing plant are intermittently visible from both roadways. Other views from these roadways are mainly of agricultural land. With the exception of the existing residence in the project area, which is currently occupied by an IDFG employee, it is unlikely that other private residences in the visual resources study area have clear views of the project area. Recreationalists at Crystal Springs Pond have the clearest views of the project area. However, much of the view of the existing hatchery facilities is screened by large trees along the perimeter of the pond.

3.3.2 Environmental Consequences—Proposed Action

The Proposed Action would result in both temporary and permanent visual changes in the study area. Temporary visual changes would result from the presence of construction equipment and construction activities. Permanent visual changes would occur primarily where new facilities would be constructed in locations where none previously existed. Permanent visual impacts would primarily be associated with construction of the new residences on the northwest corner of the project area.

During construction, visual changes associated with construction equipment and activity would be visible temporarily. These visual changes would include views of the facilities as they were being demolished, grading and vegetation removal, trenching, stockpiling of construction materials, and the presence of heavy construction equipment. Construction activities would be

concentrated in the western portion of the project area with the exception of construction associated with the wellheads and pipeline, which would occur at the existing wellhead sites around Crystal Springs Pond.

Permanent visual changes would be associated with the new hatchery facilities, located primarily on the site of existing facilities, and the three new residences to be located in the northwest corner of the project area. Because there are existing hatchery facilities in place, visual changes in this location would be less pronounced. The new residences to the northwest and the accompanying roadway would be located in an area that is currently undeveloped; these modifications would represent a more dramatic visual change. Some minor loss of vegetation would also be associated with new roadways constructed to access the wellheads for ongoing maintenance. These roads would be approximately 12 feet wide and graveled. Some access dirt roads already exist around Crystal Springs Pond, so the proposed access roads are not likely to represent a substantial visual change.

Views of construction activities and the new facilities would be intermittently visible to motorists passing by on Edwards Road and Judge Road. However, because motorists are likely to be focused on the roadway and because the existing visual characteristics of the study area are already largely developed, visual impacts on motorists from construction would be low.

Views of the construction activities and new facilities would be visible to the three proposed residences, including the existing residence. Any onsite residents would be employees of IDFG who would be working at the hatchery; therefore, their sensitivity to these changes would be lower than if they were private residents. None of the residents in the surrounding area are likely to have views of the proposed facilities. The residences to the east and northwest of the study area could have blocked views of both hatchery operations and construction activities because of distance and the presence of Russian olive tree stands. Therefore, visual impacts on residents would be low.

Visitors to Crystal Springs Pond would also be exposed to views of construction activities. Most of their views of construction activities to the west and northwest (associated with the hatchery buildings and residences) would be screened by the large trees along the perimeter of the pond. Construction activity associated with water supply improvements—such as trenching, vegetation clearing for roadway access, and wellhead improvements—would be more visible. During construction, some of the views of these areas would be screened by the large trees around the perimeter of the pond; however, construction noise and visual changes could temporarily disrupt the scenic quality and the enjoyment of those fishing at the pond. Noise impacts and impacts on recreation are discussed in greater detail in 3.12, Noise and Public Health and Safety, and Section 3.2, Land Use and Recreation. Even though construction associated with the water supply improvements would represent a temporary increase in noise, it would disrupt the scenic quality at the pond. Therefore, construction impacts on recreationalists would be moderate.

Once the construction in these areas was complete, permanent changes associated with the wellheads and roadways would be visible from some locations at the pond. Vegetation clearing associated with the roadways is anticipated to be limited to approximately a 12-foot-wide corridor and would be similar to existing dirt roadways already present in the project area. Changes at the wellheads may involve construction of small buildings around up to six of the wellheads. However, these buildings would be designed to minimize visual impacts through the use of non-reflective materials and downward-facing lighting. In addition, the wellheads already

exist and represent manmade modifications in the viewshed. Modifications to other parts of the hatchery site, such as the new residences on the northwest portion, are unlikely to interfere with recreation users' views of Crystal Springs Pond. For these reasons, visual impacts associated with the operation of the Proposed Action would be low.

3.3.3 Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG would implement the following mitigation measures to avoid or minimize impacts on visual resources.

- Restore disturbed vegetation as soon as possible after construction is completed.
- To the extent possible, design of the wellhead structures would include the use of nonreflective materials and downward-facing lighting.

3.3.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

If the Proposed Action is implemented, residents, recreational users, and motorists would be exposed to some views of construction activities. Although these views would be temporary, visual impacts associated with construction would be unavoidable. These impacts would be low to moderate. In addition, some permanent visual changes to the proposed hatchery could make it more visible in the landscape; however, these changes would be located largely in areas that are already developed or disturbed and would represent improvements over many of the existing structures, which have been abandoned. Although there would be some changes in areas that were not previously developed or that may be slightly modified, views of these changes would be intermittent or largely screened. Therefore, permanent visual impacts would be low.

3.3.5 Cumulative Impacts—Proposed Action

There are no major construction projects or other development planned in the immediate vicinity of the project area that would be visible to the same sensitive viewer groups. Therefore, the contribution of the Proposed Action to cumulative visual impacts would be low.

3.3.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no improvements made to the existing facilities. The existing facilities would be maintained to an extent but would likely degrade over time. Minor sources of lighting associated with the existing residence would continue to be used. Crystal Springs Pond and the associated public access areas would continue to be maintained by IDFG for recreation users as per existing IDFG contractual language. Therefore, there would be some low visual impacts associated with the No Action Alternative from existing sources of light and degradation of the remaining facilities.

3.4. VEGETATION

3.4.1. Affected Environment

The study area for vegetation includes the proposed hatchery site and a 100-foot buffer surrounding the proposed hatchery. Reconnaissance-level botanical surveys of the study area were conducted on July 11 and 12, 2011. Protocol-level surveys for rare, threatened, and endangered plant species were conducted on September 7, 2011.

Vegetation Communities

Seven vegetation communities were found to occur within the study area and are presented in Figure 3.4-1.

- Disturbed grassland,
- Wildrye grassland,
- Rabbitbrush shrubland,
- Big sagebrush shrubland,
- Russian olive woodland,
- Developed/disturbed land, and
- Wetlands and other waters.

Each of the vegetation communities observed in the study area is briefly described below.

Disturbed Grassland

Disturbed grassland was the most common ***vegetation community*** observed in the study area (Figure 3.4-1). Disturbed grassland is dominated by ***non-native*** grass and forb species such as cheatgrass (*Bromus tectorum*), quackgrass (*Elymus repens*), bulbous bluegrass (*Poa bulbosa*), tall tumblemustard (*Sisymbrium altissimum.*), small tumbleweed mustard (*Sisymbrium loeselii*), herb sophia (*Descurainia sophia*), musk thistle (*Carduus nutans*), burningbush (*Kochia scoparia*), and Giant sumpweed (*Cyclachaena* (*Iva*) *xanthifolia*), which was the most commonly observed native forb in disturbed grassland. Native grasses, including beardless wildrye (*Leymus triticoides*), foxtail barley (*Hordeum jubatum*), and basin wildrye (*Leymus cinereus* var. *cinereus*), were also observed sporadically in the disturbed grassland vegetation community.

Wildrye Grassland

Wildrye grassland consists primarily of dense basin wildrye (*Leymus cinereus* var. *cinereus*), a native grass species. Other species observed in this vegetation community include cheatgrass, beardless wildrye, scattered tall tumblemustard, and small tumbleweed mustard. This vegetation community was observed in only one location in the northwestern portion of the study area.

Figure 3.4-1. Vegetation Communities

ICF

Figure 3.4-1
Vegetation and Wetland Types

Rabbitbrush Shrubland

Rabbitbrush shrubland consists predominantly of an overstory of native shrubs including rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), greasewood (*Sarcobatus vermiculatus*), and scattered sagebrush (*Artemisia* sp.). Grass and forb species commonly observed in the understory of this vegetation type include cheatgrass, basin wildrye, quackgrass, tall tumblemustard, small tumbleweed mustard, musk thistle, and herb sophia.

Big Sagebrush Shrubland

Big sagebrush shrubland was observed in the northeast corner of the study area. Big sagebrush (*Artemisia tridentata*) was the dominant plant species in this community. Scattered rubber rabbitbrush shrubs were also observed. Cheatgrass was the dominant species in the understory.

Russian Olive Woodland

This vegetation type consists predominantly of a relatively open to dense overstory of Russian olive (*Elaeagnus angustifolia*). Russian olive, a non-native shrub to small tree, was commonly planted for use as wind breaks, erosion control, and bank stabilization in southeast Idaho. Non-native grass and forb species such as cheatgrass, musk thistle, herb sophia, and quackgrass, were commonly observed in the understory of this vegetation type.

Developed/Disturbed Land

Developed/disturbed areas include roads, buildings, landscaped areas around buildings, driveways, and other areas of relatively bare ground. These areas are typically either devoid of vegetation or consist of ***ruderal*** or ornamental vegetation.

Wetlands and Other Waters

Four types of wetland features were observed in the study area and are also shown in Figure 3.4-1.

- Emergent wetland,
- Forested wetland,
- ***Open water***, and
- Stream channels.

Characteristics of these features, including a description of observed vegetation, are discussed in Section 3.6, Wetlands.

Rare, Threatened, and Endangered Plant Species

The Idaho Native Plant Society maintains a list of rare plants in Idaho. Four plant species on the Idaho Rare Plant List (Idaho Native Plant Society 2007)—iodinebush (*Allenrolfea occidentalis*), meadow milkvetch (*Astragalus diversifolius*), red glasswort (*Salicornia rubra*), and spotted Joe pyeweed (*Eupatorium maculatum*)—are known to occur or have historically occurred in Bingham County, Idaho (NatureServe 2011). Additionally, one federally listed threatened

species, Ute ladies'-tresses (*Spiranthes diluvialis*) has the potential to occur in Bingham County, Idaho (U.S. Fish and Wildlife Service 2011a). Based on a review of literature and habitat requirements, meadow milkvetch, red glasswort, spotted Joe pyeweed, and Ute ladies'-tresses have the potential to occur in the study area.

No individuals of meadow milkvetch, red glasswort, spotted Joe pyeweed, or Ute ladies'-tresses were observed during field surveys in July 2011 and September 2011. Only marginally potential habitat for meadow milkvetch, spotted Joe pyeweed and Ute ladies'-tresses was observed during field surveys.

Noxious Weeds

Sixty-four plant species are designated as ***noxious weeds*** by Idaho state law (Idaho State Department of Agriculture 2011). These weeds are divided into three levels of concern.

- **Statewide Early Detection Rapid Response (EDRR) List**. The Statewide EDRR List includes weeds designated for eradication.
- **Statewide Control List.** The Statewide control list includes weeds designated for control and/or eradication.
- **Statewide Containment List.** The Statewide Containment List includes weeds for which infestations should be contained or reduced and new growth eliminated.

Four Idaho State-listed noxious weeds were observed in the study area: Canada thistle (*Cirsium arvense*), puncturevine (*Tribulus terrestris*), perennial pepperweed (*Lepidium latifolium*), and musk thistle. Canada thistle, puncturevine, and perennial pepperweed are on the Statewide Containment List and musk thistle is on the Statewide Control List. Canada thistle was observed scattered throughout the study area, primarily in disturbed grassland and near emergent wetlands and artesian wells. Puncturevine was only observed in developed/disturbed areas near the hatchery office building. Perennial pepperweed was observed in the abandoned raceways. No dense infestations of Canada thistle were observed. Musk thistle was scattered throughout the study area and was observed in virtually all vegetation types. Relatively heavy infestations of musk thistle were also observed in several locations in the study area.

3.4.2. Environmental Consequences—Proposed Action

Vegetation Communities

Construction of the Proposed Action would have direct temporary and permanent impacts on vegetation communities in the study area. Direct impacts would occur through the removal of or disturbance to existing vegetation during grading, demolition activities, and construction of new facilities, including the installation of the water supply system.

Temporary impacts are short-term impacts associated with the removal or disturbance of vegetation that could persist for several years after construction activities occur, i.e., until vegetation is reestablished. Permanent impacts are long-term impacts that result from the permanent removal of existing vegetation associated with the construction of new facilities or associated with vegetation management from ongoing maintenance.

Permanent and temporary direct impacts on vegetation types are presented in Table 3.4-1. As indicated in the table, the two vegetation communities that would be most affected would be disturbed grassland areas and developed/disturbed lands. These communities consist of ruderal, non-native vegetation or lack vegetation altogether. Most of the species in the disturbed grassland communities are non-native. Although the Proposed Action has the potential to directly affect native communities (e.g., wildrye grassland, rabbitbrush shrubland, and big sagebrush shrubland), these impacts would primarily be temporary and limited. Therefore, direct impacts on vegetation of the Proposed Action would be low.

Table 3.4-1. Direct Impacts on Vegetation Communities under the Proposed Action

Vegetation Community	Temporary Impacts (acres)	Permanent Impacts (acres)
Disturbed grassland	3.90	1.77
Wildrye grassland	0.10	0.24
Rabbitbrush shrubland	0.63	0.00
Big sagebrush shrubland	<0.001	0.00
Russian olive woodland	1.51	0.25
Wetlands and other waters[1]	0.24	0.91
Developed/disturbed lands	0.67	1.70
Total	**7.05**	**4.87**

[1] Impacts on wetlands are discussed further in Section 3.6, Wetlands.

The Proposed Action could also indirectly affect vegetation through the spread of non-native plants and noxious weeds from ground-disturbing activities and dispersal from construction equipment and personnel. Non-native plants and noxious weeds can alter the integrity of vegetation communities. Erosion and sedimentation from construction activities could also indirectly affect vegetation communities.

Much of the study area already consists of highly modified vegetation communities that include the presence of non-native plants and noxious weeds. Because the vegetation is already largely disturbed and measures would be taken to reduce the spread of noxious weeds (as indicated below) and reduce erosion and sedimentation (as indicated in Section 3.5, Water Quality and Water Quantity), the potential indirect impacts on vegetation from the Proposed Action would be low.

Rare, Threatened, and Endangered Plant Species

The Proposed Action could directly affect populations of rare, threatened, and endangered plant species through 1) mortality of individuals from trampling by construction equipment or personnel or 2) removal of individuals or habitat or degradation of habitat through ground-disturbing activities. Indirect impacts on these species could occur through the spread and colonization of noxious weeds, degradation of habitat downstream of construction activities through erosion and sedimentation, or through hydrological changes in the study area.

There are no known occurrences of rare, threatened, or endangered species in the study area. Marginally potential habitat was observed for two state-listed species, meadow milkvetch and spotted Joe pyeweed. Potentially suitable habitat for one federally listed species, Ute ladies'-tresses, was also observed during the July 2011 field visit. Therefore, although there is marginally potential habitat, it is unlikely that these three species occur in the study area.

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. 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 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.

3.4.3. Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG will implement the following measures to avoid or minimize impacts on vegetation communities; rare, threatened, and endangered plant species; and noxious weeds. Additional mitigation measures for impacts on wetlands are discussed in Section 3.6, Wetlands.

- Restrict activity and traffic to construction areas to limit unnecessary disturbance of native plant communities and reduce the spread of non-native species and noxious weeds.
- Identify clearing limits on all construction drawings. Use high-visibility construction fencing to demarcate the limits of construction and vehicle operation to prevent disturbance from occurring outside allowable areas.
- Revegetate temporarily disturbed areas with appropriate native species. Use seed mixes that meet the requirements of federal, state, and county noxious control regulations and guidelines.

- If any previously undiscovered rare, threatened, or endangered plant species is observed before or during project implementation, fence-off and avoid these individuals.
- If individuals of Ute ladies'-tresses are observed before or during project implementation and impacts cannot be avoided, implement compensatory mitigation, as determined by the U.S. Fish and Wildlife Service.
- Implement a noxious weed control program prior to and during construction. This control program will include the following elements:
  - Treat known infestations before ground disturbance begins by scheduling appropriate weed treatments, such as mowing, hand pulling and use of approved herbicides.
  - Map and flag areas of noxious weed populations for construction crews so these populations can be avoided when possible.
  - Ensure equipment brought into the construction area is free of weeds and weed seeds.
  - Work from relatively weed-free areas into the infested areas rather than vice-versa.
  - Clean equipment and vehicles of mud, dirt, and plant parts after working in infested areas.
  - Maintain weed-free staging areas.
  - Apply herbicides according to labeled rates and recommendations to ensure protection of surface water, ecological integrity, and public health and safety.
  - Implement and periodically schedule post-construction control of noxious weeds on an as-needed basis.

3.4.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Under the Proposed Action there would be some permanent impacts on vegetation as described in Section 3.4.2. Although these impacts may not be able to be fully mitigated, the potential for these impacts would be low because the impacts would be relatively minimal and would primarily be associated with vegetation communities that are already highly disturbed.

In the event that rare, endangered, or threatened plant species were affected by the Proposed Action, the mitigation measures described above would help to reduce the impacts. However, direct loss of these plant species likely could not be fully compensated; thus, impacts on rare, endangered, or threatened plant species would remain low to moderate.

3.4.5. Cumulative Impacts—Proposed Action

Ongoing agricultural activities, continued recreational use of Crystal Springs Pond, and habitat restoration activities have all affected vegetation within and surrounding the study area. Ongoing agricultural activities of the Proposed Action would continue to limit the extent of native vegetation communities in the project vicinity. Habitat restoration activities at Fort Hall include fencing off riparian areas and installing native wetland and riparian plant species and sagebrush plugs. While the restoration activities at Fort Hall have a low potential to affect rare, threatened, and endangered plant species, including Ute ladies'-tresses that occur in the project vicinity (Davis 2005), activities being implemented are likely to improve habitat for these species. Activities at Fort Hall will increase the extent of native vegetation communities near the study area.

As discussed above, the Proposed Action would result in some impacts on vegetation associated with direct and indirect disturbance to vegetation communities and potential loss or disturbance of rare, endangered, and threatened plant species in the proposed hatchery site. However, impacts on vegetation communities in general would be low and would not significantly contribute to a cumulative impact on those vegetation communities. With implementation of mitigation measures, impacts on rare, endangered, and threatened plant species would be low to moderate and no significant contribution to cumulative impacts would occur. Therefore, cumulative impacts on rare, endangered, and threatened plant species would be low.

3.4.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative there would be no ground-disturbing activities associated with improving the existing facilities. Maintenance of the existing facilities would continue, as would recreational fishing at Crystal Springs Pond. Similar to existing conditions, there would be low impacts on vegetation associated with ongoing activities (i.e., maintaining existing vegetation conditions to provide access to the existing wells and Crystal Springs Pond and controlling weeds on the property). Vegetation management includes mechanical and chemical methods of removal but could include limited periodic burning. Because there would be no ground-disturbing activities under the No Action Alternative, the potential for disturbance to vegetation and the spread of noxious weeds would be low compared with the Proposed Action.

3.5. WATER QUALITY AND WATER QUANTITY

3.5.1. Affected Environment

The study area for water quality and water quantity consists of groundwater resources hydraulically contiguous to the proposed hatchery site, and surface waters including Crystal Springs Pond, Boom Creek, American Falls Reservoir, and the outstocking locations.

Groundwater

Groundwater in the study area exists both as shallow groundwater and water in the deeper confined East Snake Plain ***Aquifer*** (ESPA). Regionally, groundwater flows toward the west-southwest. In the study area, groundwater flows toward American Falls Reservoir, a hydraulic low point. Within the study area, the static level of groundwater is estimated to be at 6 to 8 feet above ground surface, providing for the artesian flow from the existing wells (SPF Water Engineering 2010).

East Snake Plain Aquifer

The ESPA is one of the largest confined aquifers west of the Continental Divide (occupying 10,800 square miles), and was designated as a sole source aquifer by EPA in 1991. A wide variety of uses, including drinking water, agriculture, food processing, aquaculture, and fish and wildlife habitat, are dependent on the ESPA. The ESPA is also critical to the maintenance of flows in the Snake River, which support hydropower, recreation, and fisheries (Idaho Department of Water Resources 2009).

Regional trends with respect to water level in the ESPA indicate a decline, prompting the state of Idaho to prepare a comprehensive management plan to improve and stabilize the water supply from the ESPA (Idaho Department of Water Resources 2009). As part of the evaluation of the proposed hatchery, SPF Water Engineering (2010) conservatively estimated that the aquifer water levels could drop an average of 15 feet over the next 20 years. Groundwater declines have resulted from complex combinations of decreased recharge incidental to irrigation conveyance and application, increased use of groundwater for irrigation and domestic use, and conversion of land from irrigated agriculture to urban and suburban uses.

The ***artesian wells*** at the existing hatchery tap the ESPA, which has a water-bearing stratum of sand and gravels approximately 45 feet thick (Clearwater Geosciences 2008). The nine artesian wells, with an average depth of 265 feet, were drilled over a period of 10 years, starting in 1989 and ending in 1999. The total flow from the nine wells was measured at 17.79 cfs in 2007. The total flow from all sources, including the wells and springs contributing to Crystal Springs Pond was 23.75 cfs (Engineering Science and Construction 2007). The average temperature at seven of the wells in November 2010 was 10.2 degrees Celsius (°C) (50.4 degrees Fahrenheit [°F]). Specific conductance averaged 575 Siemens per centimeter (S/cm) in 2010. There were no detectable metals in the well water tested, and total nitrogen was less than 2 milligrams per liter (mg/L) (SPF Water Engineering 2010). Several key water quality parameters that were measured during aquifer testing activities in November 2010 can be found in Appendix C.

Shallow Groundwater

Shallow groundwater also exists in the study area and was found to vary seasonally at depths from 2.5 to 6.5 feet below ground surface level (Engineering Science and Construction 2007; Idaho Department of Fish and Game 2010). This shallow groundwater is found in shallow subsurface soils that are characterized as mainly sandy silts 2 to 3 feet thick, underlain by sands, silty sands, clayey sands and clays.

Surface Water

Crystal Springs Pond

The nine artesian wells flow into Crystal Springs Pond, which is approximately 4 acres in size. Crystal Springs Pond is also fed by the surrounding shallow groundwater and provides good water quality and high value habitat for terrestrial and resident aquatic species (Idaho Department of Fish and Game 2010). The pond also supports a small recreational fishery for stocked trout.

Boom Creek

Crystal Springs Pond overflows at the south perimeter of the existing hatchery to form Boom Creek (also known as Boone Creek). A 48-inch-diameter corrugated metal culvert conveys the water under Edwards Road to become the source water for Boom Creek. When the existing hatchery was in operation, its raceway water discharged through the outfall and combined with the overflow from Crystal Springs Pond into Boom Creek. Boom Creek flows southwesterly 2 to 3 miles and enters the Snake River at American Falls Reservoir (Idaho Department of Fish and Game 2010).

The *American Falls Reservoir Subbasin Total Maximum Daily Load Plan*, which was completed in 2006 (Idaho Department of Environmental Quality 2006) and updated in 2009 (Idaho Department of Environmental Quality 2009), acknowledged Crystal Springs as contributing nutrient loads to American Falls Reservoir. Crystal Springs is effectively Boom Creek since the overflow from Crystal Springs Pond and the existing hatchery formed Boom Creek. Total phosphorus and suspended sediment load allocations are currently being revised, but were allocated at 1.22 and 61.1 tons/year, respectively for the hatchery within both the 2006 and the 2009 TMDL reports (Idaho Department of Environmental Quality 2006, 2009).

Flow measurements were made in the Crystal Springs from April 1985 through June 1988. The average daily flow was 41 cfs, the maximum flow recorded was 93 cfs on April 18, 1987, and the minimum flow recorded was 19 cfs on June 27, 29, and July 1 through 5, 1985 (SPF Water Engineering 2010). The U.S. Geological Survey (USGS) reported that the flow in Boom Creek was affected by irrigation return flow (SPF Water Engineering 2010).

American Falls Reservoir

American Falls Reservoir is the largest reservoir in Idaho with a surface area of 56,055 acres at a ***pool elevation*** of 4,354.4 feet (Idaho Department of Environmental Quality 2006). The primary function of the reservoir is to store water for irrigation. Reservoir refill typically starts in October and continues through winter and early spring. The irrigation season begins in June and the reservoir is drawn down as consumptive use exceeds inflow. The ***hydrograph*** for the downstream region is now highly modified: spring flows are reduced while summer flows are increased for water delivery to downstream irrigators. Water fluctuations in the reservoir can vary widely depending on weather conditions each year and irrigation demand. Other sources of water for the reservoir are the Snake and Portneuf rivers and spring-fed creeks between the city of Blackfoot and the Fort Hall Bottoms (Idaho Department of Environmental Quality 2009).

Beneficial uses of the reservoir, as designated in the *Idaho Water Quality Standards*, are coldwater aquatic life, salmonid spawning, primary contact recreation, and agricultural and domestic water supply. ***Secondary contact recreation*** is also an existing beneficial use. American Falls Reservoir was included on the list of impaired waters in 1998, as required under ***Section 303(d) of the Clean Water Act,*** because of low dissolved oxygen and high levels of nutrients and sediment, which affect beneficial uses of the water body (Idaho Department of Environmental Quality 2006, 2009). The reservoir has a history of algae problems associated with increased nutrient levels in the reservoir. The TMDL identified sources of nutrients to the reservoir as tributaries, springs, and drains; waterfowl; and internal recycling of phosphorus.

3.5.2. Environmental Consequences—Proposed Action

Groundwater

Initial construction work for the proposed hatchery would require demolition of the existing hatchery facilities, grading of some portions of the area, and trenching for placement of the pipelines, which would convey the groundwater from the wells to the proposed hatchery. These ground-disturbing activities could result in impacts on shallow groundwater quality through accidental fuel or lubricant spills from the construction equipment, and increased infiltration of stormwater in areas where vegetation would be removed. Activities that could expose shallow

groundwater to contaminants would be limited to where construction equipment would be operated or stored and the risk would be temporary. Accidental releases of pollutants are rare, and BMPs would be specified in the construction NPDES permit for use and refueling of the equipment during construction to minimize the potential for spills. In the unlikely event of an accidental spill, prompt cleanup would be required by a Spill Prevention, Control, and Countermeasures Plan; therefore, the potential for impacts on shallow groundwater quality would be low. The ESPA is a much deeper, confined aquifer and, for all practical purposes, the potential for impacts on the deeper aquifer resulting from construction activities would be low.

Operation of the proposed hatchery would require the use of high-quality groundwater, which would be provided by the existing artesian wells. As stated previously, the total flow from the nine wells was measured at 17.79 cfs in 2007 (SPF Water Engineering 2010). The ESPA productivity has decreased significantly in recent years, which has probably decreased flows at the wells (Engineering Science and Construction n.d.). These declines are likely related to multi-year drought conditions and increased irrigation efficiency (SPF Water Engineering 2010).

In an average water year, artesian flows would be adequate to meet hatchery demand for at least 6 months (May through October); however, during the peak months (November through April) up to four of the highest-producing wells likely would need to be pumped to meet water supply demand during peak fish-rearing periods. The project hatchery demand is shown in Table 3.5-1. When equipped with pumps, the existing artesian wells would be able to produce the required peak month hatchery supply of 28.6 cfs even if deep groundwater levels lowered. For planning purposes, it has been suggested that because of ESPA's downward trend, a corresponding increase in pumping lifts should be included in the final proposed hatchery design plan to ensure that adequate supply could be met (SPF Water Engineering 2010).

Increased groundwater withdrawal from pumping to meet hatchery demand has limited potential to result in direct local impacts on the ESPA. Although preliminary analysis indicates the hydraulic head could be drawn down in the vicinity of the wells on the order of 30 to 40 feet below ground surface (assuming pumping over a 4-month period during peak pumping [SPF Water Engineering 2010]), the drawdown is anticipated to last only during the period of pumping.

The amount of water that would be required by the hatchery is relatively small compared to the size of the ESPA. For example, a maximum pumping rate of 28.6 cfs over 4 months is equivalent to approximately 6,800 acre-feet of water per year. The irrigation use in the ESPA during the same period has been estimated at approximately 500,000 acre-feet, with annual withdrawal rates upwards of 7.5 million acre-feet (Contor *et al*. 2004). Additionally, within the project vicinity, the ESPA exhibits relatively high ***transmissivity***, the rate at which groundwater travels horizontally (approximately 500,000 gallons per day per foot), which allows for the relatively free movement of water. As shown in Table 3.5-1, even after the period of peak pumping demand (12,855 gallons per minute in April), sufficient transmissivity exists to allow for water levels to return to pre-pumping conditions with relatively little lag time, after which the wells would overflow once again under artesian pressure. As mentioned previously, artesian flow would be sufficient to supply hatchery demand for the remainder of the year under current conditions.

For these reasons, impacts on the regional groundwater supply resulting from the Proposed Action would be localized, would not result in permanent changes in water levels, and would, therefore, be low.

Table 3.5-1. Projected Hatchery Water Demand

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cfs	19.2	21.2	22.6	28.6	3.2	4.4	3.7	7.7	9.5	12.1	14.4	16.0
gpm	8,628	9,533	10,126	12,855	1,455	1,967	3,009	3,456	4,426	5,439	6,463	7,181

Source: SPF Water Engineering 2010.

Surface Water

Construction of the Proposed Action would require demolition of the existing hatchery facilities, grading, and trenching for placement of the water supply pipelines between the wells and the proposed hatchery. These ground-disturbing activities would expose bare soils and could lead to increased erosion and sedimentation of nearby surface water.

Construction work within waterways or wetlands could result in direct impacts on water quality associated with increased turbidity from erosion and sedimentation. Indirect impacts on water quality could occur if sediment-laden runoff from construction work areas enters streams or other surface waters. Several factors would minimize the potential for water quality impacts during construction. Since the proposed hatchery site is relatively flat, most construction would occur during the dry season, and sediment control BMPs would be implemented to minimize the potential for runoff to enter surface waters. Because of these conditions, the potential for temporary impacts on surface water quality from construction would be low.

Crystal Springs Pond

Diversion of the artesian well water for proposed hatchery operations could decrease water flows through Crystal Springs Pond leading to an increase in ***water residence time***. A decreased turnover rate in pond water would allow additional surface water warming to occur over time with the potential to adversely affect aquatic life beneficial uses. As a condition of the proposed hatchery property purchase, IDFG agreed to maintain Crystal Springs Pond as a public fishing site. While diversion of artesian spring water from the pond to the proposed hatchery would reduce this source of water, there also appears to be upwelling spring flow entering the pond (probably from a separate shallower aquifer), and therefore, reductions in flow may be adequately mitigated. Additionally the presence of shallow groundwater detected in the proposed hatchery site is likely to contribute significantly to inflow to Crystal Springs Pond. Water inflow changes to the pond are not expected to compromise trout populations or recreational uses. As required by the terms of the property purchase agreement, pond water quality would be monitored, and changes in hatchery water use would be made to provide more flow through the pond if determined necessary (Idaho Department of Fish and Game 2010). Therefore, the potential for this impact would be low.

Operation of the proposed hatchery also has the potential to indirectly affect downstream waters from increased turbidity and sedimentation. Data on sand production during 2010 pump testing of three of the artesian wells indicate sand content of up to 0.05% within the water over the last 15 minutes of each ***step down***. Therefore, increased groundwater discharge has the potential to release increased levels of sand to Boom Creek and American Falls Reservoir.

The sediment in the proposed hatchery source water would not be beneficial; however, the pumps would be designed and operated to minimize sediment in the proposed hatchery supply water, which eventually discharges to Boom Creek. Remedies could include flushing waste upon pump start up for up to 1 hour and incorporating sand traps to contain sand prior to entry into the proposed hatchery facilities. The future wells could also be constructed with well screens and filter packs to eliminate or significantly reduce sand production. Furthermore, sand production likely will decrease significantly during continuous pumping. For example during well tests water from wells 4 and 6 was visually cloudy after the initial startup but became clear at the end of the last step (SPF Water Engineering 2010).

Crystal Springs Trout Farm, the previous hatchery located in the proposed hatchery site, used the existing artesian wells, and was found to not be a significant source of sediment to downstream waters (Idaho Department of Environmental Quality 2009). The estimated average total suspended solids (TSS) concentrations in the Crystal Springs Trout Farm effluent was well below their NPDES permit maximum concentration limit or the target concentration of 60 mg/L (Idaho Department of Environmental Quality 2006). The Proposed Action would use the same water source as the source used for Crystal Springs Trout Farm operations, supporting the efficacy of hatchery management and operations in preventing increased sedimentation in Boom Creek and American Falls Reservoir.

Boom Creek

Without appropriate management, the Proposed Action would have the potential to directly affect water quality in Boom Creek and subsequently American Falls Reservoir from the discharge of hatchery effluent. Hatchery effluent could contain organic solids, such as uneaten food, fecal matter, algae, parasitic microorganisms, or dissolved solids, all of which have the potential to affect downstream water quality and biological resources dependent on aquatic environments. The discharge of the proposed hatchery effluent could be problematic in environments suitable for salmonids and other species, such as aquatic insects, which are highly sensitive to water quality impairments; it could also result in degradation of the downstream aquatic environment.

Although proposed hatchery effluent discharge could result in impacts on downstream water quality, impacts would be avoided by adhering to applicable water quality standards established for the protection of the specific aquatic environments in Boom Creek and American Falls Reservoir. The proposed hatchery would also be required to meet NPDES requirements and wasteload allocations under the current 2009 TMDL report. In addition, the facility would be required to be operated in compliance with all Idaho Department of Water Resources (IDWR) discharge and monitoring requirements including the dissemination of all monthly, quarterly, and annual discharge and monitoring reports as required by law and/or permitting. Permits and compliance reports (current and historical) would be available upon request (Idaho Department of Fish and Game 2010: Appendix A).

The potential release of suspended and dissolved organic solids into Boom Creek and subsequently American Falls Reservoir is a concern because American Falls Reservoir is 303(d) listed for nutrients, sediments, and low dissolved oxygen. Increased nutrients could lead to ***eutrophication***, which in turn, could cause algae blooms and aquatic plant growth, and related depletion of dissolved oxygen, plant decay odors, and reduced water clarity. This could affect aquatic species' abilities to sight-feed and obtain oxygen. Furthermore, recreation and general aesthetic appeal of water bodies could be affected by reduced water clarity.

Several water quality standards apply to water bodies in the American Falls Subbasin, such that, when met, beneficial uses are supported. Ultimately, the goal of water quality standards and a TMDL plan is to support beneficial uses in Idaho lakes and streams. Some water quality numeric standards are more directly applicable to conditions in the American Falls Subbasin. These include standards for dissolved oxygen, temperature, turbidity, and bacteria. Standards also exist for other pollutants that are generally not a problem in American Falls Subbasin such as pH, toxic substances, and ammonia (Idaho Department of Environmental Quality 2009).

The waste load allocations for the *American Falls Reservoir Subbasin Total Maximum Daily Load Plan* were established for total phosphorous, total nitrogen, and suspended sediment and based on target concentrations chosen such that attainment of the target would result in meeting beneficial uses for the reservoir. Although IDEQ determined that phosphorus is the primary nutrient causing growth of algae in American Falls Reservoir, waste load targets for tributaries to the reservoir were established for both total phosphorus and total nitrogen at 0.05 and 0.85 milligrams per liter (mg/L), respectively, within the 2006 TMDL report (Idaho Department of Environmental Quality 2006). In the 2009 TMDL report the target for total phosphorus was set at 0.05 mg/L for tributaries and point sources to the reservoir, with an interim total phosphorus target of 0.07 mg/L to be achieved in the short term and until the 0.05 mg/L target is reevaluated. Load allocations for nitrogen were not established in the 2009 report; however, IDEQ recommended maintaining current levels of nitrogen (Idaho Department of Environmental Quality 2009). In addition, both the 2006 and 2009 TMDL reports included an average suspended sediment target concentration not to exceed 60 mg/L over a 14-day period. Targets for dissolved oxygen were not recommended as it was assumed that control of nutrients and subsequent reduction in algal densities would lead to observance of water quality standards for dissolved oxygen in the reservoir (Idaho Department of Environmental Quality 2006). Both estimated phosphorus and nitrogen concentrations from the existing hatchery discharges were below these target concentrations (Idaho Department of Environmental Quality 2006, 2009).

Based on waste load allocations in the 2009 *American Falls Reservoir Subbasin Total Maximum Daily Load Plan*, specific discharge allocations were established for the Crystal Springs Trout Farm. The allocations were 1.22 tons/year of phosphorus, 6.7 tons/year of nitrogen, and 61.1 tons/year of suspended sediment (Idaho Department of Environmental Quality 2006, 2009). These values were used in establishing the daily discharge limitations implemented within the Crystal Springs Trout Farm NPDES permit under the effluent limitations for American Falls Reservoir of 6.6, 36.9 and 334.8, lbs/day net total phosphorus, nitrogen, and net TSS, respectively (U.S. Environmental Protection Agency 2006: Appendix E). Preliminary calculations indicate that the nutrient and sediment loads in the proposed hatchery's effluent would be far below the TMDL allocation limits, and therefore, would require no load reductions (Idaho Department of Fish and Game 2010: Appendix A).

To further ensure that effluent from the proposed hatchery would not detrimentally affect surface waters, discharge water quality would be compared to applicable water quality standards and guidelines, such as those included in the NPDES permit, the Integrated Hatchery Operation Team (IHOT), and the Pacific Northwest Fish Health Protection Committee. Discharge water quality would also be compared with pertinent state of Idaho water quality plans related to temperature, nutrient loading, and chemicals (Idaho Department of Fish and Game 2010: Appendix A). Additional NPDES permits may be required for proposed hatchery operations if production reaches the regulated level specified by the general permit (Idaho Department of Fish and Game 2010: Appendix A).

Under the Proposed Action, solids (feces and uneaten food) would be collected from the raceways and settled in two sedimentation ponds for eventual disposal at an off-site location. Specifically, wastes from early rearing and juvenile rearing raceways would be cleaned and settled solids would be removed using a piped vacuum system that would convey the concentrated wastes to a dual-cell off-line settling pond located next to the raceways. In addition, an 8- to 10-foot-long quiescent zone would be provided at the downstream end of each raceway to allow settleable solids to separate from the water column. A separate cleaning waste vacuum piping system would be used to collect settled solids for each raceway and convey the concentrated wastes to the off-line settling ponds (Idaho Department of Fish and Game 2010).

The two settling pond cells would be sized to treat the peak cleaning waste flow from the facility and would allow one cell to be dewatered and cleaned out without interrupting normal hatchery operations. The settling ponds would be designed to meet guidelines of the IDEQ and EPA (CFR 122.24) for confined animal feeding operations. Preliminary sizing indicates that two side-by-side cells, measuring 15 feet wide by 40 feet long by 4 feet deep, would allow hatchery operators to vacuum clean at least two raceways at a time, with a vacuum flow of 100 gpm each; this safety factor is four times the IDFG-recommended minimum size. Because of these measures, the potential for increased turbidity and sedimentation in downstream waters due to the release of organic solids associated with the proposed hatchery operations is considered to be low (Idaho Department of Fish and Game 2010).

Hatchery effluent could contain water treatment chemicals, therapeutic chemicals, and vaccines used to treat specific parasite or disease conditions of the cultured fish or prevent the formation of detrimental fungal or bacterial conditions. Chemicals commonly used in sockeye hatcheries include iodophor, argentine, formalin, oxytetracycline, florfenicol, and erythromycin. The use and subsequent release of treatment chemicals and therapeutic chemicals at hatcheries has the potential to adversely affect the quality of receiving waters and uses if the concentrations exceed ambient water quality standards or otherwise adversely affect aquatic biota such that indirect effects occur on aesthetic appeal or recreational opportunities. The use of therapeutic chemicals within hatcheries is regulated under EPA's *Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category,* which establishes narrative limitations for aquaculture chemicals. Because the use of these therapeutic chemicals would follow accepted standard practices, treatment applications would be applied only when necessary and typically would be of short duration, and thus, the potential impacts on receiving water quality would be low.

To ensure that the proposed hatchery facilities operate in compliance with all applicable fish health guidelines and facility operation standards and protocols, annual reports indicating level of compliance with applicable standards and criteria along with periodic audits indicating level of compliance would be performed (Idaho Department of Fish and Game 2010: Appendix A). All chemical handling, application, and disposal would adhere to U.S. Department of Agriculture (USDA), U.S. Food and Drug Administration (FDA) Center for Veterinary Medicine (CVM) regulations and other state and federal regulations to protect human and environmental health.

A document describing BMPs for the proposed hatchery has been completed that would be updated as management and programmatic needs change. In addition staff would be trained in the proper use, transport, handling, and storage of all chemicals to minimize dangers of over-exposure or accidental release to the environment. Appropriate safety equipment would be provided, and chemicals would be stored in areas designed to contain chemicals in the event of a leak or accidental spill. Any used absorbent materials containing controlled chemicals would be disposed consistent with the applicable federal, state, and local regulations.

In the proposed hatchery environment, stress associated with the captivity and close proximity of rearing conditions would increase fish vulnerability to infection and thus, the opportunity for disease transmission. This, in turn, may result in pathogen amplification, followed by the release of these aquatic pathogens in hatchery effluents. The potential for hatchery effluents to serve as a vehicle for pathogen transfer could affect downstream aquatic organisms. All sockeye smolts produced at the hatchery would be transported to the Sawtooth basin for release in targeted recolonization areas. IDFG would use therapeutic chemicals to prevent disease spread and transmission at the outstocking sites. The proposed hatchery would not discharge to waters that support ESA-listed anadromous salmonids, which would prevent potential viral and bacterial pathogens from proposed hatchery operations entering streams that support ESA-listed populations (Idaho Department of Fish and Game 2010). Therefore, the potential impacts from disease transmission would be low.

Fish health would be observed daily for feeding response, external condition, behavior, and initial indicators of problems. In particular, fish culturists would look for signs of lethargy, spiral swimming, side swimming, jumping, flashing, unusual respiratory activity, body surface abnormalities, or unusual coloration. Presence of any of these behaviors or conditions would be immediately reported to the program fish pathologist for appropriate action (Idaho Department of Fish and Game 2010: Appendix A).

The proximity of the Crystal Springs Pond public fishing area creates potential disease vectors (birds and fish), particularly for the transmission of the Infectious Hematopoietic Necrosis (IHN) virus into the rearing facilities. Fish health protocols used in the captive broodstock program follow accepted, standard practices. Protocols conform to the fish health requirements detailed in ESA Section 10 Propagation Permit Number 1120 for IDFG rearing of ESA-listed Snake River sockeye salmon. Additionally, considerable coordination was carried out between NOAA and IDFG fish health experts, as well as participants at the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC). When required, the captive broodstock rearing program has used various disinfectants, antibiotics, vaccinations, and antifungal treatments to control pathogens, which would continue at the proposed hatchery (Idaho Department of Fish and Game 2010: Appendix A). Furthermore juveniles, pre-smolts and smolts, would be sampled (60 fish sample) 45 to 60 days before release. All transport permits would be approved before juveniles

were transferred. All mortality from captive reared adult release groups would be sampled and analyzed. This disease history would be used to obtain approval before transfer and release (Idaho Department of Fish and Game 2010: Appendix A). For these reasons, potential impacts associated with increased risk of disease are low.

Outstocking activities would involve transporting up to 1 million sockeye salmon smolts to the existing outstocking locations at the outlets of the targeted Sawtooth Valley lakes over a period of approximately 2 to 3 weeks each spring. These smolts would be at a size and condition where they would be expected to volitionally migrate downriver to the sea almost immediately. When the adults return 2 years later, many would be collected for broodstock; however, as the program matured, many adults would enter the targeted lakes, spawn naturally and die. Sockeye salmon carcasses, like the carcasses of other anadromous salmonids, provide nutrients that support primary and secondary production, which in turn supply food for future juvenile salmon and other native fish species. Currently, the Sawtooth Valley lakes are starved of nutrients, which were contributed by the larger salmon runs that historically existed in the basin. Overall, eventual contributions of nutrients from naturally spawned sockeye salmon carcasses to these lake systems would be beneficial.

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 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 water bodies, 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.
- 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 storage of fuel and other potential pollutants in a secure location at least 150 feet away from streams, water bodies, and wetlands; that ensures spill containment and cleanup materials are readily available on site and restocked within 24 hours, if used; and that, in the event of a spill, contractors are trained to immediately contain the spill, eliminate the source, and deploy appropriate measures to clean and dispose of spilled materials in accordance with federal, state, and local regulation.

- 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, and pipes), at least 150 feet from streams, water bodies, 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 feet away from any stream, water bodies, and wetlands.
- Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.
- Reseed disturbed areas after construction and regrading are complete, at the appropriate time period for germination.
- Monitor germination of seeded areas and 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.
- 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.

3.5.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Although there is the potential for temporary and localized impacts on water quality during construction, these impacts would not be permanent or long term and would be localized. Implementation of the mitigation measures described above would reduce these impacts but would not completely eliminate them.

Water quality discharges during operation would be required to comply with the NDPES permit. Some low impacts associated with stocking fish in Redfish, Pettit, and Alturas lakes and their associated outfalls would remain.

The Proposed Action could result in some low, temporary impacts on groundwater supply during pumping, which would remain after mitigation.

3.5.5. Cumulative Impacts—Proposed Action

Regional groundwater levels in the ESPA have exhibited declining trends over time, which have been associated with both drought conditions through the late 1990s and increased agricultural irrigation efficiency (SPF Water Engineering 2010). Several actions in the project vicinity have had and will continue to have an effect on regional groundwater levels. In addition to the proposed hatchery operations, current agricultural and domestic water use and continued development are expected to increase the demand for groundwater over time, which would also draw from the ESPA. For planning purposes, it is appropriate to consider that the historic declines in the regional aquifer could result in water level declines by 15 feet over the next 20 years (SPF Water Engineering 2010). Potential future declines would be offset to some extent by implementation of the ESPA Comprehensive Aquifer Management Plan, which establishes a long-term plan for water supply management and demand in the ESPA (Idaho Department of Water Resources 2009).

In the event that groundwater levels were to decline by 15 feet over time, preliminary modeling suggests that some pumping to supply the proposed hatchery from mid-summer through April may be necessary (SPF Water Engineering 2010). However, the hatchery water demands during non-peak periods (May through December) after the smolts have been transported off site would be substantially less than the peak period (January through April) and would not likely result in substantial drawdown of the groundwater levels. Even with continuous pumping year-round, it is estimated that groundwater levels would be drawn down on the order of 3 additional feet (SPF Water Engineering 2010). As discussed above, it is anticipated artesian flow would return once pumping has stopped because of high transmissivity and relatively low water demand given the size of the ESPA. Therefore, the potential cumulative impacts of the Proposed Action on water quantity would be low.

Several actions in the project vicinity have also had and will continue to have an effect on water quality. Periodic pumping during peak demand at the hatchery would result in an additional discharge into American Falls Reservoir and, as discussed above, temporary, localized decreases. Based on the water quality evaluations within American Falls Reservoir (Idaho Department of Environmental Quality 2009), the extent of water quality and quantity disturbances associated with the Proposed Action would only contribute a minor amount to cumulative water quality impacts within the subbasin. Therefore, cumulative impacts on water quality would be low.

3.5.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no impacts associated with improvement of the existing facilities. Site activities and current groundwater usage would continue unchanged from existing conditions. Currently, less than 100 gallons of water per day are used (associated with the existing residence). Similar to existing conditions, no pumping would occur, and the existing wells would continue to overflow. Because no infrastructure improvements would be made, it is anticipated that the existing water rights would eventually be lost. Therefore, potential effects on groundwater under the No Action Alternative would be low.

Crystal Springs Pond (and associated public access areas/outhouse) would continue to be maintained with IDFG funds as addressed in existing land purchase agreements. Some low water quality impacts, associated with increased nutrients from biomass related to stocked fish and increased phytoplankton, would occur as a result of maintaining the recreational and existing hatchery facilities.

3.6. WETLANDS

3.6.1 Affected Environment

The study area for wetlands includes the proposed hatchery site. Reconnaissance-level wetland surveys were conducted in the study area on July 11 and 12, 2011. These surveys included general mapping of wetland features that may be subject to U.S. Army Corps of Engineers (Corps) jurisdiction pursuant to Section 404 of the Clean Water Act. Four types of wetland features were observed in the study area and are discussed in greater detail below.

- Emergent wetland,
- Forested wetland,
- Open water, and
- Stream channel.

Emergent Wetland

Emergent wetlands were observed in several locations in the study area including along the margins of stream channels and open water, and in areas previously used as raceways and sediment basins for the existing hatchery (Figure 3.4-1). Typical species observed in emergent wetlands along the edges of stream channels and open water include cattail (*Typha latifolia*), bulrush (*Scirpus acutus*), yellow monkeyflower (*Mimulus guttatus*), rabbitsfoot grass (*Polypogon monspeliensis*), water speedwell (*Veronica anagallis-aquatica*), watercress (*Nasturtium officinale*), quackgrass (*Elymus repens*), and various sedge (*Carex* sp.) species.

Species commonly observed in the two emergent wetlands previously used as sediment basins included cattail, bulrush, stinging nettle (*Urtica dioica*), and fringed willowherb (*Epilobium ciliatum*). Scattered Russian olive trees were observed in the sedimentation basin wetlands and in the emergent wetlands along the edges of stream channels and open water in the proposed hatchery site.

Species commonly observed in the emergent wetlands located in the old raceways included yellow monkeyflower, water speedwell, curly dock (*Rumex crispus*), fringed willowherb, lesser Indian paintbrush (*Castilleja minor* ssp. *minor*), alkali bulrush (*Schoenoplectus* [*Bolboschoenus*]) *maritimus*), various sedge and rush (*Juncus* sp.) species, and scattered cattail.

Forested Wetland

Forested wetlands were observed along the southeastern edge of Crystal Springs Pond. Russian olive was the dominant species observed in forested wetlands. Stinging nettle, rabbitsfoot grass, and Kentucky blue grass (*Poa pratensis*), and climbing nightshade (*Solanum dulcamara*) were also observed in the understory of forested wetland. Cattail and bulrush commonly occurred on the margins of the forested wetland.

Open Water

In the study area, open water was observed associated with artesian wells, Crystal Springs Pond, and the confluence of water flowing from the abandoned raceways and Crystal Springs Pond.

Stream Channel

Stream channels in the study area include artificially constructed stream channels associated with the artesian wells, a constructed concrete outlet at the southwest end of Crystal Springs Pond, and water flowing from the eastern raceway which runs through a culvert to join the Crystal Springs Pond overflow stream. The combined flow from the eastern raceways and Crystal Springs Pond leaves the study area via a 48-inch culvert under Edwards Road where it forms Boom Creek just south of the study area.

3.6.2 Environmental Consequences—Proposed Action

Direct impacts on wetlands under the Proposed Action would occur from disturbance by construction equipment and placement of temporary or permanent fill within wetlands for construction of the proposed hatchery facilities. Work within wetlands would also result in trampling, breaking, and crushing wetland vegetation.

Permanent impacts are long-term impacts that result in the permanent loss of wetland features. Temporary impacts are short-term impacts that would persist for several years after construction activities occur until wetland vegetation and hydrology is reestablished. The Proposed Action would result in up to 0.91 acre of permanent wetland loss affecting emergent wetlands (Table 3.6-1). Impacts would occur from construction of the proposed hatchery facilities and the water supply system. Construction of access roads for the water supply system could also affect wetlands; however, final placement of these access roads would be sited to avoid wetlands whenever possible. Temporary disturbance associated with construction could affect up to 0.24 acre of wetlands (Table 3.6-1). In areas of temporary disturbance, some wetland functions would be lost or impaired during and after construction until the area was revegetated. Prior to any construction activities, IDFG would be required to obtain a permit pursuant to Section 404 of the Clean Water Act for impacts on wetlands under the jurisdiction of the Corps. Implementation of the measures required in the permit would likely include purchasing credits at an approved wetland mitigation bank, thereby ensuring that wetland impacts would be adequately mitigated. Therefore, potential direct impacts on wetlands would likely be low.

Table 3.6-1. Direct Impacts on Wetland Features under the Proposed Action

Wetland Feature	Temporary Impact (acres)[1]	Permanent Impact (acres)[1]
Emergent wetland	0.07	0.91
Forested wetland	0.03	0.00
Open water	0.07	0.00
Stream channel	0.07	0.00
Total	**0.24**	**0.91**

[1]Acres of impacts on wetland features are approximations based on reconnaissance-level surveys conducted on July 11 and 12, 2011.

Indirect impacts on wetlands could occur through sedimentation and erosion from construction activities. Indirect impacts could also occur through damage to vegetated buffers along wetlands, including increased risk of spreading noxious weeds. Vegetated wetland buffers perform important functions, such as, filtering and removing sediment and other contaminants that could enter wetlands. Impacts on buffers would be minimized at construction areas within 100 feet of wetlands through the implementation of mitigation described below and in Section 3.4, Vegetation. Silt fences would enclose as much of the wetland and buffer area as possible to restrict the area where work would be performed. This will minimize the removal of wetland buffer vegetation and decrease the potential for construction-related runoff and erosion sediment from entering wetlands. Because disturbance to wetland buffers from construction activities would be minimized and temporary (with the exception of minor soil compaction), the indirect impacts on wetlands and wetland buffers would be low.

As discussed in Chapter 2, Project Alternatives, six of the nine existing artesian wells would be fitted with pumps to provide water supply during peak months. Additional indirect impacts on wetlands associated with the stream channels and the margins of Crystal Springs Pond could occur when water is captured by the wellhead improvements and piped directly to the hatchery instead of being allowed to overflow. The interruption of water flow could alter the hydrology of the stream channels and the extent of emergent wetlands along the edges of the stream channels. Water levels in Crystal Springs Pond could also be affected by this interruption of water flow, which could impact emergent and forested wetlands along the margins of the pond, as well as the outlet stream, and potentially Boom Creek.

Pumped water from the six wells for the proposed hatchery facilities is anticipated to be needed only during peak demand, which is estimated to occur from November through April. This time of year is generally wetter and some natural precipitation may offset potential indirect impacts. Additionally, 5 to 6 cfs enters the pond directly via sub-surface springs (Idaho Department of Fish and Game 2010), which would also help offset potential impacts. Overflow from three remaining undeveloped wells would provide additional base flow into the pond. IDFG would also monitor and maintain water quality in Crystal Springs Pond by managing inflow of water into the pond. However, some amount of water may be lost and could result in loss of wetlands within the stream channels and around the edges of Crystal Springs Pond. Depending on the extent of these impacts, they would be low to moderate.

3.6.3 Mitigation—Proposed Action

As mentioned previously, IDFG will be working with the Corps to obtain a permit pursuant to Section 404 of the Clean Water Act prior to construction. IDFG will comply with the terms of the permit, including specific mitigation requirements. In addition to those requirements, if the Proposed Action is implemented, IDFG will implement the following mitigation measures to minimize impacts on wetlands.

- Locate roads and other design features to avoid or minimize impacts on wetlands and streams, whenever possible.
- When working next to wetlands (including their buffer areas) and water bodies, limit disturbance to the minimum necessary to achieve construction objectives, minimize habitat alteration and the effects of erosion and sedimentation.
- Flag or stake wetland boundaries in the vicinity of construction areas so that wetlands and streams can be avoided during construction.
- Do not place machinery, construction vehicles, or equipment within 100 feet of any stream or wetland unless placement is authorized by a permit or is on an existing road.
- Refuel machinery and store it a minimum of 150 feet from wetlands and waterways and inspected regularly for leaks.
- If temporary roads are built in wetlands, underlay temporary fill with geotextile fabric or portable pads, remove all fill, and revegetate with appropriate native wetland plant species in compliance with required permits.

- Design and implement any construction activities to minimize unavoidable impacts; 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 for this permit (see Section 4.3).
- Implement an erosion control and sedimentation plan, which will include sedimentation and erosion control measures, such as silt fences, straw bales, and jute matting to prevent sediment from entering waterways and wetland habitats.
- Revegetate temporarily disturbed areas with appropriate native species.
- Monitor water quality at Crystal Springs Pond to ensure maintenance of water quality parameters including but not limited to temperature, dissolved oxygen, and chlorophyll a concentrations.

3.6.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

Up to 0.91 acre of emergent wetland could be permanently affected under the Proposed Action. These permanent impacts would be associated with wetlands that have formed in the abandoned raceways, which would be removed and new raceways would be constructed in their place. Although almost an acre of wetland could be permanently lost, these wetlands formed artificially and although some native vegetation occurs, they are dominated by non-native species. Less than 0.25 acre of wetland could be temporarily affected under the Proposed Action. Unavoidable impacts on wetlands, after implementation of the mitigation measures would be considered low.

3.6.5 Cumulative Impacts—Proposed Action

Past and present actions in the project vicinity have resulted in cumulative impacts on wetlands through conversion and degradation from agricultural and rural development and road construction. Impacts on wetlands also likely occurred through construction of the American Falls Dam and Reservoir, which flooded portions of the Snake River and adjacent landscape. Construction of the existing hatchery also likely resulted in impacts on wetlands in the immediate area, although the extent is not known. Future development and road construction are likely to affect wetlands.

The Proposed Action would contribute to cumulative impacts on wetlands through the permanent removal and temporary disturbance of wetlands. However, implementation of the mitigation measures described above would reduce these impacts. In addition, because many of these wetlands were likely artificially created and contain largely non-native plant species, cumulative impacts on wetlands from the Proposed Action would be low.

3.6.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no ground-disturbing activities and the existing hatchery would not be improved or modified. Existing maintenance activities and recreational use of Crystal Springs Pond would continue in a manner similar to existing conditions. There would be very minimal temporary impacts on wetlands under the No Action alternative associated with maintenance activities. These impacts would be low.

3.7. FLOODPLAINS

3.7.1. Affected Environment

The study area for ***floodplains*** includes the project area and surrounding IDFG property. As discussed in Section 3.5, Water Quality and Water Quantity, Crystal Springs Pond and Boom Creek are located in the study area. These bodies of water are fed by artesian flow from the existing wells, by shallow groundwater, and to a much lesser extent by stormwater runoff associated with snowmelt and rain.

The Federal Emergency Management Agency (FEMA) identifies areas with a 1% chance of being flooded during a given year as 100-year floodplains as Class A. The study area is not located within a 100-year floodplain, but FEMA has mapped it as Class C (Federal Emergency Management Agency 1979). Class C areas are defined as areas with little chance of flooding. The closest 100-year floodplain, associated with the American Falls Reservoir, is located approximately 0.9 mile south of the study area (Federal Emergency Management Agency 1979).

3.7.2. Environmental Consequences—Proposed Action

Because the study area is not located in a floodplain, the risk of flooding in the study area is considered low. Therefore, there would be no impacts on floodplains associated with construction activities or the placement of new structures in a designated floodplain.

As described in Section 3.5, Water Quality and Water Quantity, water discharges from the proposed hatchery to Boom Creek are not anticipated to increase the flow of Boom Creek beyond existing high flows. Therefore, the potential exposure of structures or people to flooding would remain low. There would be no impact on floodplains and no increased risk of flooding associated with the Proposed Action.

3.7.3. Mitigation—Proposed Action

Because the Proposed Action would have no impact on floodplains and no increased risk of flooding, no mitigation would be required.

3.7.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

There would be no unavoidable impacts on floodplains and no increased risk of flooding.

3.7.5. Cumulative Impacts—Proposed Action

Because the Proposed Action would have no impact on floodplains and no increased risk of flooding, it would not contribute to a cumulative impact.

3.7.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing hatchery would not be improved. The existing facilities would continue to be maintained but would degrade over time. Crystal Springs Pond and the associated public access areas would continue to be maintained by IDFG for recreational users but would not result in any impacts on floodplains. Therefore, there would be no impacts on floodplains and no increased risk of flooding associated with the No Action Alternative.

3.8. GEOLOGY AND SOILS

3.8.1. Affected Environment

The study area for geology and soils is the existing hatchery boundary, which encompasses the area that could be affected by seismic impacts, soil erosion, and slope-stability impacts. Regional geology within the Snake River Plain is also considered as part of the geology and soils assessment.

Regional Geology

The study area is within the ***alluvial plain*** of the Snake River. USGS identifies the regional geological unit in the Snake River Plain as "Qs ***quaternary surficial*** cover, ***fluveolian*** cover on Snake River Plain, ***alluvial fans*** (Snake River Group)" (Idaho State University 2011a).

Seismic Faults

Although the mountains surrounding the Snake River Plain are seismically active, there are few known faults that could affect the study area. Policy G3 Seismic Activity of the Bingham County General Plan states "The major portion of the county lies in the Snake River Plain, which serves to deaden shocks from fault movement in other locations; therefore, the county as it involves population centers is considered relatively aseismic" (Bingham County 2005).

The closest active ***seismic faults*** to the proposed hatchery are the Idaho Rift System Faults within the Snake River Valley, the closest of which is 30 miles west of the proposed hatchery. The closest fault in the surrounding mountains is the East Side Sublette Range Fault, which is roughly 40 miles southwest of the proposed hatchery.

Local Surface Soils

The study area includes four types of loamy surface soil (Natural Resources Conservation Service 2011): fia, fingal loam; Fr, Firth sandy loam; Ld and La, LaJara sandy loams. These loamy soils exhibit the following soil properties:

- **Moderately susceptible to wind erosion.** Susceptibility to wind erosion is quantified by the Natural Resources Conservation Service (NRCS) Wind Erodability Group. The loamy soils found within the study area vary from being the "least susceptible" to "moderately susceptible" to wind erosion (Natural Resources Conservation Service 2011).

- **Relatively unsusceptible to water erosion.** Soils within the study area range from "least susceptible" to "moderately susceptible" to water erosion (Natural Resources Conservation Service 2011).
- **Very limited for design of septic tank absorption fields, due to slow water movement through the soil** (Natural Resources Conservation Service 2011)**.** This characteristic does not affect construction of pipelines or structures.

Steep Slopes

The study area is generally level, except for the sidewalls of Crystal Springs Pond and the Boom Creek channel. The portions of the study area where new construction activity is proposed are level, with no areas of steep unstable slopes.

3.8.2. Environmental Consequences—Proposed Action

The Bingham County Comprehensive Plan acknowledges that although there are active seismic faults in the region, the alluvial soils within the Snake River Plain further reduce potential seismic impacts by serving to deaden any potential seismic activity. Regardless of the low likelihood for seismic activity, the Proposed Action would be designed to handle suitable ground shaking caused by potential earthquakes. Bingham County has adopted the 2009 International Building Code, which would be followed in the design and construction of the Proposed Action. The County would specify seismic design criteria that must be used to construct buildings and structures at the proposed hatchery. Because the appropriate seismic criteria would be incorporated into the design and subject to design review and permitting by Bingham County, impacts from seismic ground shaking would be low.

The Proposed Action could result in direct and indirect impacts on soils from construction-related activities. Direct impacts could occur as a result of direct soil disturbance, leading to loss of soils or soil compaction. Indirect impacts could occur as a result of temporary vegetation removal and grading that could lead to increased erosion over time. The loamy surface soils in the study area are moderately susceptible to wind erosion and water erosion. Loss of plant cover and movement of soil could disrupt biological functions, including nutrient retention and recycling, and thus could reduce productivity, at least temporarily.

Indirect impacts from project construction could include minor ***sheet erosion*** and the creation of some small channels. If soils were left bare or were slow to revegetate, minor gullying and other erosion could occur. Eroded soils could enter nearby surface waters and degrade water quality. The risk of erosion would be highest on areas with relatively steeper slopes and during heavy rainfall. With the implementation of BMPs through the NPDES permit, and mitigation discussed below, indirect impacts would be low.

Wastewater disposal from the proposed hatchery office building and the onsite residences would be disposed of by expanding the existing septic system and constructing new septic systems. However, the loamy soil at these areas is of limited use for septic systems. Therefore, the septic system would be designed in accordance with Bingham County guidelines to accommodate the marginal soil conditions. With the implementation of proper design considerations, the potential impact on geology and soils would be low.

3.8.3. Mitigation—Proposed Action

NPDES regulations require the facility to implement an Erosion and Sedimentation Control Plan. Bingham County construction codes 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 regulatory-required BMPs, if the Proposed Action is implemented, IDFG will 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 with a sediment fence, straw wattles, or a similar method that meet the NPDES 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 has achieved stabilization (defined as at least 70% cover by native or acceptable non-native species) is achieved; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate re-vegetation 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.

3.8.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Although implementation of construction BMPs and mitigation would reduce the potential for increased erosion, some increased levels of temporary erosion would be expected during and immediately after construction. Long-term impacts remaining after mitigation would be limited to normal sedimentation from paved surfaces, soil compaction, some erosion of formerly vegetated ground, and loss or elimination of natural biological functions in the very few and

isolated areas that were formerly undeveloped but would be converted to access roads. Impacts on soils would be low during and shortly after construction, and would remain at a low level as disturbed areas re-vegetate.

3.8.5. Cumulative Impacts—Proposed Action

The principal past, ongoing, and future activities that can be expected to cumulatively affect geology and soils in the project vicinity are farming and grazing. Because implementation of regulatory BMPs and mitigation measures described above would ensure that impacts of the Proposed Action would be low, the contributions to cumulative geology and soil impacts would also be low.

3.8.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no improvements to the existing facilities, which would continue to degrade over time. Because no improvements would be made, some of the facilities would represent a potential risk of exposure to seismic hazards. Ongoing maintenance activities would have the potential to result in low impacts on geology and soils associated with ground disturbance activities, similar to those described above; however, the extent of the disturbance would be less given that no improvements would be made.

3.9. FISH AND WILDLIFE

3.9.1. Affected Environment

Fish and Aquatic Species

The study area for fish and aquatic species includes all streams, ponds, and wetlands within the existing hatchery and up to and including the American Falls Reservoir. Because fish species present at the outstocking locations also have the potential to be affected by the Proposed Action, fish species with the potential to be present in the Upper Salmon River Basin are also considered in this analysis. As discussed in Section 3.5, Water Quality and Water Quantity, surface waters in the immediate vicinity of the proposed hatchery include Crystal Springs Pond, Boom Creek, and the American Falls Reservoir. The outstocking locations include Redfish, Alturas, and Pettit lakes and their associated outfalls within the Upper Salmon River Basin.

Crystal Springs Pond is stocked annually with rainbow trout (*Oncorhynchus mykiss;* Idaho Department of Fish and Game 2011). Other species that are present in the America Falls Reservoir may also be present in Boom Creek and Crystal Springs Pond. Species known to inhabit American Falls Reservoir include black bullhead (*Ameiurus melas*), black crappie (*Pomoxis nigromaculatus*), brown trout, common carp (*Cyprinus carpio*), cutthroat trout, fathead minnow (*Pimephales promelas*), longnose dace (*Rhinichthys cataractae*), mountain sucker (*Catostomus platyrhynchus*), mountain whitefish (*Prosopium williamsoni*), rainbow trout, redside shiner (*Richardsonius balteatus*), sculpin (*Cottus* sp.), speckled dace (*Rhinichthys osculus*), Utah chub (*Gila atraria*), Utah sucker (*Catostomus ardens*), whitefish (*Prosopium* sp.), yellow perch, and Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*) (Idaho Department of Fish and Game 2011).

Redfish, Pettit, and Alturas lakes are relatively small, pristine, high-elevation, coldwater lakes. Fish that inhabit these lakes include brook trout (*Salvelinus fontinalis*), bull trout (*Salvelinus confluentus*), spring-run Chinook salmon (*Oncorhynchus tshawytscha*), kokanee salmon (landlocked *Oncorhynchus nerka*), sculpin (various *Cottus* sp.), sockeye salmon (anadromous *Oncorhynchus nerka*), steelhead (anadromous *Oncorhynchus mykiss*), sucker (various *Catostomus* sp.), and Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*). IDFG has also stocked the following species into these lakes over the last 5 years: rainbow trout in Pettit Lake and Alturas Lake and sockeye salmon (smolts or eggs) in Redfish Lake, Redfish Lake Creek, Pettit Lake, and Alturas Lake.

Fish species that have the potential to occur within the study area that are listed for protection under the ESA are presented in Table 3.9-1. Of these species, none are located in the area of the proposed hatchery. All of these species may be found in the Upper Salmon River Basin near the broodstock collection facilities and at the outstocking locations.

Table 3.9-1. ESA-Listed Fish Species in the Study Area

Common Name	Scientific Name	ESA status	Location Of Known And Expected Habitat
Columbia River Bull Trout	*Salvelinus confluentus*	Threatened	Bull trout are not known to occur in the Snake River within at least 80 miles downstream of the proposed hatchery. Bull trout occupy the proposed smolt outstocking locations. These areas are located within designated critical habitat for bull trout.
Snake River Sockeye Salmon	*Oncorhynchus nerka*	Endangered	Snake River sockeye are not found in the immediate vicinity downstream of the proposed hatchery. They are located within the Snake River upstream of the Salmon River, but hundreds of miles downstream of the hatchery site. Snake River sockeye occupy the proposed smolt outstocking locations. The Salmon River, Redfish Lake, Pettit Lake, and Alturas Lake are designated critical habitat for this species.
Snake River Chinook Fall Run	*Oncorhynchus tshawytscha*	Threatened	Snake River fall-run Chinook do not occupy the Upper Snake or Salmon River basins, and no critical habitat is designated in these basins.
Snake River Chinook Spring\Summer Run	*Oncorhynchus tshawytscha*	Threatened	Snake River spring-/summer-run Chinook are not found in the immediately vicinity downstream of the proposed hatchery. They are known to occupy the Salmon River downstream of the confluence of Redfish Lake Creek. Snake River spring-run Chinook occupy the proposed smolt outstocking locations. The Salmon River is designated critical habitat for Snake River spring-run Chinook salmon.

Common Name	Scientific Name	ESA status	Location Of Known And Expected Habitat
Snake River Steelhead Summer Run	*Oncorhynchus mykiss*	Threatened	Snake River summer-run steelhead do not occupy the Upper Snake or Salmon River basins and are not located within the vicinity of the proposed hatchery, and no critical habitat is designated in these basins. Snake River summer-run steelhead occupy the proposed smolt outstocking locations. The Salmon River, Redfish Lake, Pettit Lake, and Alturas Lake are designated critical habitat for this species.

Sources: USFWS 2011a, BPA Et Al 2011.

In the study area, ***critical habitat*** is designated within the Salmon River for Snake River Chinook spring-/summer-run and Columbia River bull trout. Redfish, Pettit, and Alturas lakes are designated critical habitat for Snake River steelhead summer-run, and Columbia River bull trout. The Upper Salmon River Basin is ***essential fish habitat*** for Chinook salmon (see Section 4.2.3).

Boom Creek, Crystal Springs Pond, and its associated wetlands also provide potential breeding or rearing habitat for several amphibian species. Based on the habitat requirements and known distribution of amphibian species in Idaho (Idaho State University 2011b), the following species could occupy the area of the proposed hatchery: tiger salamander (*Ambystoma tigrinum*), western toad (*Bufo boreas*), great basin spadefoot toad (*Scaphiopus intermontanus*), boreal chorus frog (*Psuedacris maculata*), and northern leopard frog (*Rana pipiens*). Amphibians that could occupy the lakes or streams and associated with the smolt outstocking locations include the following species: long-toed salamander (*Ambystoma macrodactylum*), tailed-frog (*Ascaphus truei*), western toad, Pacific treefrog (*Psuedacris regilla*), and Columbia spotted frog (*Rana luteiventris*). There are no ESA-listed amphibian species present in Idaho.

Wildlife

The study area for terrestrial wildlife species includes all areas at the proposed hatchery site affected by ground-disturbing activities (e.g., demolition sites, proposed hatchery facilities, water supply system and pipelines, new residences, roads), and a 0.25-mile-wide buffer surrounding these areas to account for potential noise impacts on wildlife. Because the broodstock collection and outstocking activities have very little potential to affect terrestrial wildlife, those areas are not included in the study area and are not discussed further in this analysis.

Information on wildlife in the study area was obtained from IDFG personnel, as well as from available literature and databases. A reconnaissance-level survey of the study area was conducted in July 2011, to evaluate biological resources, including the presence of wildlife and wildlife habitats.

Much of the surrounding landscape supports intensively farmed and irrigated agricultural lands, or is used for livestock grazing. Crops grown in the project vicinity include hay, wheat, barley, sugar beets, and potatoes (Idaho Department of Fish and Game 2010). The study area itself has

been extensively modified by a variety of land uses, including the existing hatchery and past cannery operations, agriculture, livestock grazing, recreational fishing, and road construction to provide access for these land uses.

Common vegetation community types as described in Section 3.4, Vegetation, include disturbed grasslands, Russian olive woodlands, and rabbitbrush shrubland. Non-native grasses and weeds, including cheatgrass, quackgrass, tumble mustard, musk thistle and herb Sophia, are abundant in these cover types. Russian olive, an invasive non-native tree, is prevalent throughout much of the study area. As a consequence, these habitats generally provide lower-quality habitat for wildlife. Other less common upland habitats that provide better-quality wildlife habitat includes wild rye grasslands and big sagebrush shrubland. Common wildlife species observed or expected to be found in these upland habitats include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), mountain cottontail (*Sylvilagus nuttallii*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), western kingbird (*Tyrannus verticalis*), western rattlesnake (*Crotalus viridis*), gophersnake (*Pituophis catenifer*), and western skink (*Eumeces skiltonianus*), among others.

As mentioned above and discussed in greater detail in Section 3.5, Water Quality and Water Quantity, open water, riparian, and wetland habitats are associated with Crystal Springs Pond, the artesian well and spring overflow channels that flow into the pond, and Boom Creek that flows from the pond. Wildlife expected to use these habitats include a variety of waterfowl, shorebirds, swallows, numerous other birds, raccoon (*Procyon lotor*), muskrat (*Ondatra zibethicus*), mule deer, and boreal chorus frog (*Pseudacris maculate*), among others. Waterfowl, including mallard (*Anas platyrhynchos*), teal (*Anas discors, Anas crecca*) and Canada goose (*Branta canadensis)*, loaf and feed on and adjacent to Crystal Springs Pond, especially during spring and fall migration periods (Engemann pers. comm. 2011). Great blue heron (*Ardea herodias*) were observed feeding along shallow shorelines and in emergent wetlands. Osprey (*Pandion haliaetus*) are occasionally observed perched near Crystal Springs Pond, and are presumed to nest in suitable riparian areas along the nearby Snake River and American Falls Reservoir (Engemann pers. comm. 2011). A wide variety of birds were observed in the riparian/wetland areas, including red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), yellow warbler (*Dendroica petechia*), bank swallow (*Riparia riparia*), cedar waxwing (*Bombycilla cedrorum*), American robin (*Turdus migratorius*) and ring-necked pheasant (*Phasianus colchicus*). Many bird species would be expected to use both riparian/wetland habitats and adjacent upland habitats for feeding, nesting, and cover.

No wildlife species classified as threatened or endangered by USFWS or IDFG are reported to occur in Bingham County, or would be expected to occur in the study area. USFWS identified two candidate species for federal listing that may occur in Bingham County: greater sage-grouse (*Centrocercus urophasianus*) and yellow-billed cuckoo (*Coccyzus americanus*). Greater sage-grouse are not expected to occur in the study area because of the extensive conversion of sagebrush rangeland to agriculture. The yellow-billed cuckoo is an extremely rare migrant and summer resident of southeastern Idaho found in cottonwood riparian woodlands with a dense understory of willow and dogwood (Idaho State University 2011c; Reynolds and Hinckley 2005). Suitable cottonwood-willow habitat does not occur in the study area.

3.9.2. Environmental Consequences—Proposed Action

Fish and Aquatic Species

Construction

Fish and other aquatic species in the study area could be affected by changes in water quality, water quantity, and physical habitat. Potential effects could result during construction activities from temporary disturbance or loss of habitat, increased noise, and temporary decreases in water quality associated with accidental spills or increased erosion.

Construction activities with the potential to affect aquatic habitat would be limited to the areas around the well heads and at the proposed hatchery outfall. Underwater noise would be minimal because the extent of the construction would be limited and temporary. Although there would be some minor modifications to habitat during construction, these changes would be minimal and would not substantially reduce the area of available aquatic habitat. Therefore, there would be a low impact from construction on aquatic species.

Operation

As described in Section 3.5, Water Quality and Water Quantity, the Proposed Action is not expected to significantly affect water quantity or quality in Crystal Springs Pond during operation. Crystal Springs Pond receives substantial inflow from shallow groundwater, in addition to overflow discharge from several artesian wells. Therefore, there would be low impacts on fish and other aquatic species related to changes in water quantity in Crystal Springs Pond.

The Proposed Action has the potential to directly affect fish in Boom Creek and subsequently American Falls Reservoir from the discharge of proposed hatchery effluent during the peak fish rearing period (November through April). During peak production, the discharge to Boom Creek is expected to increase since a greater volume of water would be used in the proposed hatchery than is currently discharged from the artesian wells. The flow gage directly below the hatchery recorded flows from January through April in 2010 and 2011 as 21 to 25 cfs and 23.6 to 26.3, respectively. Because the flow rate in Boom Creek is not expected to substantially increase beyond the range of natural variability for that stream, no increase in streambank erosion is expected. Even in the event that the full 50 cfs water right is periodically realized, discharges of this volume would occur only for short periods every few years and would be similar to the periodic high flows associated with a typical storm event. Furthermore, as discussed in Section 3.5, Water Quality and Water Quantity, the potential impacts of the proposed hatchery effluent in the receiving water quality would be low. Based on this analysis there would be a low potential for the proposed hatchery discharge to affect fish.

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). 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. 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 IHN 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. A study of predation in Redfish and Alturas lakes conducted in 1993 indicated that the stomach contents of bull trout from these lakes contained 79% *O. nerka* (sockeye or kokanee) (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 outmigration resulting from the Proposed Action. This would be a beneficial impact on bull trout.

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. 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 hatchery genetic management plan to work with NMFS to address potential impacts from genetic interactions (Idaho Department of Fish and Game 2010). 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 hatchery genetic management plan includes performance standards, indicators of performance and monitoring and evaluation requirements. 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. 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.

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, 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.

Wildlife

Construction and operational activities associated with the Proposed Action could result in direct and indirect impacts on wildlife resulting from the loss, modification, and degradation of habitats. Clearing of vegetation and other site-preparation activities may cause direct wildlife mortality or may displace wildlife into adjacent habitats where they would compete with other wildlife for limited resources. In addition, increased noise and human activity could result in the displacement of some wildlife from portions of the study area.

Loss of wildlife is often an unavoidable consequence whenever development removes or modifies suitable habitat that supports local wildlife populations. About 4.9 acres of wildlife habitat would be permanently removed under the Proposed Action, with another 7.1 acres temporarily disturbed as discussed in Section 3.4, Vegetation (Table 3.4-1). Most (87.5 %) of these impacts would involve previously developed land or habitat with lower wildlife value due to prior land uses (i.e., disturbed grassland, Russian olive woodland, rabbitbrush shrubland). Impacts on habitats with a higher wildlife value would be limited to small areas of wetland (0.9 acre permanent, 0.2 acre temporary) and wildrye grassland (0.2 acre permanent and 0.1 acre temporary) cover types. Temporarily disturbed areas would be revegetated using native species, again providing habitat for wildlife once these areas have been restored.

Construction

Degradation of wildlife habitat could occur if noxious weeds are allowed to establish in areas disturbed by construction. Non-native plants generally provide poorer quality forage and lower overall habitat suitability for native wildlife species. Numerous weedy and invasive plant species known to be regionally problematic (including cheat grass, Canada thistle, musk thistle, and Russian olive) are documented in the study area. Appropriate weed control measures would be undertaken to minimize the spread of these species in the construction zone and would ensure potential impacts associated with degradation of habitat were low.

During any clearing, demolition, and construction, wildlife could be killed or displaced by the operation of heavy equipment. Less mobile and more secretive animals, such as reptiles, amphibians, and small mammals, could incur greater direct mortality than more mobile animals, such as birds and larger mammals, which would be displaced to adjacent habitats. Land-clearing during the spring and early summer nesting period could be more detrimental to avian reproductive success than clearing conducted during non-nesting periods.

Migratory birds and their active nests are afforded protection under the Migratory Bird Treaty Act (see Section 4.2.4). Numerous migratory bird species are expected to use habitats in the study area for nesting, as a winter refuge, or as a stopover site during annual migrations. The Proposed Action could affect these species. Migratory birds would be expected to flee land-clearing activities and thus avoid direct mortality. Construction activities, including vegetation clearing, would be conducted in a manner to avoid impacts on migratory birds. In the event that potential impacts cannot be avoided, BPA will work with USFWS to determine additionally required mitigation measures.

Human activities and elevated noise levels during construction could temporarily displace wildlife from areas near the construction activity. Construction activities that would generate noise include the operation of heavy equipment such as bulldozers, excavators, backhoes, and dump trucks. Noise would also result from the movement of workers, materials, and equipment. Noise levels would be loudest near construction activity, but would diminish with increasing distance from the source. As noted in Section 3.12. Noise and Public Health and Safety, construction-associated noise should not be discernable above background levels beyond 1,000 to 2,000 feet from the construction area. These noise increases would generally be limited to daytime hours when active construction is occurring. Wildlife would likely avoid the construction zone during periods of active construction, and some wildlife in adjacent areas could be temporarily displaced. However, it is not unusual for wildlife to habituate to noise and human presence if no direct harassment occurs. Thus, the overall potential for impacts on wildlife from noise and human presence during construction are expected to be low, temporary, and limited to the construction area and immediately adjacent habitats.

Most of the study area would not be physically disturbed during site development and could, therefore, receive displaced wildlife. Generally when wildlife is displaced into adjacent habitats, increased competition for available space and resources in these areas can depress local population levels (an indirect impact). As construction is completed and disturbance levels decline, habitats adjacent to disturbed areas again become suitable for use by wildlife. Considering the small area of undeveloped habitat (9.6 acres) to be disturbed by the Proposed Action, and the limited extent and duration of noise disturbance, the potential for displacement impacts on wildlife populations is low.

A small, temporary increase in local traffic would be generated over the 16-month construction period as discussed in Section 3.11, Transportation. Approximately 1,200 truck trips would be expected to supply concrete, imported fill, and pavement; remove debris; and deliver other materials during the construction period. In addition, about 16 full-time employee positions would be created to fulfill construction needs. These project-associated increases in traffic could result in a small, temporary increase in traffic-related wildlife mortalities. Considering the low additional volume of traffic expected during construction, it is unlikely that local wildlife could suffer significant population declines from increased vehicular traffic.

Operational

Human activities, noise, and traffic associated with operation of the proposed hatchery would also result in low impacts on wildlife. Three full-time positions would be staffed by employees who live on the site, and four part-time jobs would be staffed by employees who commute from the surrounding area. A maximum of five supply deliveries per month would be incurred to support proposed hatchery operations, and up to 40 truck trips would be required annually in the spring to transport smolts for outstocking. Operation of the proposed hatchery would include wellhead water supply pumps, recirculation pumps, mechanical chillers, and a backup generator—all housed in buildings or dedicated weather/acoustical enclosures. Most wildlife species that use the study area would be expected to habituate to these low levels of noise and activity. However, some temporary wildlife displacement could occur during high activity periods, such as during spring smolt outstocking. The small increase in traffic on local roadways could contribute to a small incremental increase in traffic-related wildlife mortalities.

Water diversion to support proposed hatchery operations has the potential to affect high value wetland and riparian habitats used by wildlife. Under the Proposed Action, water for proposed hatchery operations would be supplied by seven of the nine existing artesian wells, with peak water demand for the hatchery expected from November through April (Idaho Department of Fish and Game 2010). Discharge into the artesian well overflow channels that empty into Crystal Springs Pond would be temporarily interrupted when flow is diverted into the proposed hatchery supply system. This change in hydrology could affect wetland and riparian habitat that has developed along the overflow channels. This effect would be minimized by plumbing the wells so that discharge into the overflow channels would continue when not in use by the proposed hatchery. Discharge during non-peak water demand months (May through October) should be sufficient to maintain existing wetland/riparian habitats.

Implementation of the mitigation described below would help minimize the potential effects on wildlife. However, some disturbance would occur and would be low to moderate depending on the extent of the disturbance.

No wildlife species classified as threatened or endangered by the USFWS or the IDFG are expected to occur in the study area. Consequently, there would be no impacts on listed wildlife species under the Proposed Action.

3.9.3. Mitigation—Proposed Action

Fish and Aquatic Species

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.

- 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 discharge of these substances to the receiving waters.
- Use therapeutic chemicals only when necessary and 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.

Wildlife

If the Proposed Action is implemented, IDFG would carry out the following mitigation measures to avoid or minimize impacts on wildlife resources. Additional measures aimed at mitigating additional impacts that could adversely affect wildlife are discussed in Sections 3.4, Vegetation, 3.6, Wetlands, and 3.12, Noise and Public Health and Safety.

- Explain wildlife-related mitigation measures to construction contractors and inspectors during a preconstruction meeting covering environmental requirements.

- Avoid clearing native habitats during the avian breeding season (March through July). If clearing cannot be avoided during these times, survey the clearing zone prior to activity to determine whether any active nests of migratory birds are present. If active nests are detected, develop a plan to avoid impacts until young have fledged.

3.9.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Fish and Aquatic Species

Although mitigation would minimize the disturbance of fish and other aquatic species during construction, some low level of disruption would remain. Operation of the proposed hatchery is not expected to adversely impact fish or aquatic species. Bull trout and other ***piscivorous*** fish downstream of the smolt release sites are likely to benefit from additional smolts released, since the additional smolts would increase their prey base.

Wildlife

Implementation of the mitigation measures described above would reduce impacts on wildlife resources, but would not completely eliminate them. Some less-mobile species of wildlife could be killed incidentally by equipment during construction, and a small increase in traffic-related wildlife mortalities could occur. A small amount of permanent habitat loss, primarily low value wildlife habitats, would result with project construction. Noise, activity, and vegetation removal during construction would cause a temporary loss of wildlife habitat in and near the construction zone. These minimal losses to wildlife and wildlife habitat are not expected to adversely affect the viability or survival of local wildlife populations. Therefore, unavoidable impacts on wildlife resources, after mitigation, would be low to moderate.

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 (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. 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. Therefore, the Proposed Action would not result in any changes to contribute to a cumulative impact associated with broodstock collection.

Additional restoration projects in the area include the Fort Hall and Salmon Creek Habitat Restoration projects, both of which would have beneficial impacts on locally occurring aquatic habitat and species. The Crystal Springs project would have the same beneficial impacts as the Proposed Action (i.e., contributing to restoration of the Snake River sockeye DPS). Therefore, the cumulative impacts on fish and aquatic species would be beneficial. Operation of these other facilities would depend on the same broodstock collection facilities as the Proposed Action, resulting in no additional impact.

Wildlife

Wildlife resources in the project vicinity have been extensively altered as large areas of natural landscape were converted to intensively farmed and irrigated cropland, and grazing land for livestock. Portions of the Snake River and adjacent landscape were flooded to construct American Falls Dam and Reservoir, providing flood control, abundant irrigation water, and recreation to this area. In addition to farming and ranching impacts, the study area was modified to support the existing hatchery and past cannery operations. The cumulative loss, degradation, and fragmentation of wildlife habitat from these actions have contributed to declines in wildlife populations and biodiversity in the project vicinity. Numerous federal and state habitat restoration projects have been implemented in the vicinity of the proposed hatchery to mitigate the effects of these actions. Projects involving riparian, wetland, and range restoration have been beneficial to wildlife resources.

Farming and ranching activities would continue to represent the land use activities affecting wildlife resources the most. Federal and state programs involving habitat restoration would continue to benefit wildlife. No new major construction projects are planned for areas near the proposed hatchery. The Proposed Action would contribute to cumulative wildlife impacts in the project vicinity through the permanent removal of small areas of wildlife habitat, temporary disturbance to and displacement of wildlife and from wildlife killed incidentally during construction and from associated traffic. The potential for these incremental cumulative impacts on wildlife resources to occur is considered low.

3.9.6. Environmental Consequences—No Action Alternative

Fish and Aquatic Species

Under the No Action Alternative, there would be no redevelopment of the existing hatchery. Local aquatic habitat in Crystal Springs Pond and Boom Creek would not be affected. Sockeye salmon recovery would be slower under the No Action Alternative because supplementation would continue at current levels instead of the 500,000 to 1 million smolts/year anticipated under the Proposed Action. Furthermore, the existing hatchery would not be operational and additional time would likely be required to plan and permit a replacement hatchery. Incidental capture of bull trout at broodstock collection facilities would continue and would be the same as under the Proposed Action.

Wildlife

Under the No Action Alternative, the existing hatchery would not be modified. Maintenance of existing hatchery facilities would continue in a manner similar to existing conditions, as would recreational use of Crystal Springs Pond. Potential impacts limited to minor disturbance from recreational use and very limited periodic maintenance activities would continue. Because wildlife impacts associated with the No Action Alternative would be temporary and localized, these impacts would be low.

3.10. CULTURAL RESOURCES

Cultural resources include prehistoric and historic archaeological sites, historic structures, and traditional cultural properties (properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and those that meet the NRHP criteria). The National Historic Preservation Act of 1966, as amended (NHPA), requires that these resources be inventoried and evaluated for eligibility for listing in the NRHP and agencies to evaluate and consider effects of their actions on these resources. Cultural resources are evaluated for eligibility in the NRHP using four criteria commonly known as Criterion A, B, C, or D, as identified in 36 CFR Part 60.4(a–d). These criteria include an examination of the cultural resource's age, integrity, and significance in American culture, among other things. A cultural resource must meet at least one criterion to be eligible for listing in the NRHP.

Laws and regulations protecting cultural resources are discussed in more detail in Chapter 4.

3.10.1. Affected Environment

Affected Historical Communities

This information is intended to portray the following groups of people as they appeared in the mid-19th century. At and immediately following contact with Euro-American cultures, these societies were significantly altered as a result of population losses from exotic diseases, encroachment on territory and resources, and partial assimilation into European culture.

The study areas lie within the traditional historical territory of the Northern Shoshone, Bannock, and Paiute tribes. The Springfield Hatchery site is immediately west of the Fort Hall Indian Reservation and north of the American Falls Reservoir. The territory of the Northern Shoshone and Bannock tribes roughly coincides with the political boundaries of the state of Idaho, south of the Salmon River. The terms *Northern Shoshone* and *Bannock* are general terms used to distinguish Shoshones of the upper Columbia River drainage from the Western Shoshone of Nevada and Utah and the Eastern Shoshone of western Wyoming. These distinctions are based on variations in location and access to different resources, which affected subsistence strategies and social and cultural traditions.

The Bannock were Northern Paiute speakers who migrated from Oregon into the Snake River plains where they lived among Shoshone speakers. Influences that differentiated the Bannock from the Northern Paiute to the west included access to horses and buffalo and participation in cultural events, such as buffalo hunts.

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.

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 the pedestrian survey of the study area, no archaeological resources or traditional cultural properties were identified. This area has been dramatically altered by the construction of the Crystal Springs Hatchery facilities. Therefore, it is unlikely that intact archaeological resources would be identified within this area. The northern end of the property, where the three new residences and access roads would be constructed, is currently an overgrown agricultural field that has been historically plowed.

Because of the limited surface visibility in this area, three shovel test probes excavated to determine if cultural materials were present below ground surface. In addition, two meandering transects were walked in this area. During the course of this testing, no artifacts were identified.

During the course of this field survey, one historic structure was identified: the existing Crystal Springs Hatchery facility and raceways. Little information is readily available about the Crystal Springs Hatchery; however, it has been rumored to have been one of the largest privately owned hatcheries in the west. The original structure was built in 1950 by a private landowner and was in use until the mid-1980s (Figure 3.10-1). 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, 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 is not considered a ***historic property*** under the NHPA.

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

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. 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.

3.10.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Under the Proposed Action, there would be no unavoidable impacts remaining after mitigation.

3.10.5. Cumulative Impacts—Proposed Action

As mentioned above, cultural resources within and surrounding the study area have been affected by agriculture and other development. Because the Proposed Action would not affect historic properties, it would be not contribute to a cumulative impact on cultural resources.

3.10.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, no modifications would be made to the existing hatchery building other than routine maintenance. Cultural resources would remain unaffected. Sockeye production would not significantly increase, and tribal ceremonial and subsistence use of this traditional cultural resource would likely be unchanged from current conditions.

3.11. TRANSPORTATION

3.11.1. Affected Environment

The study area for transportation includes the proposed hatchery site, area roadways used to access the proposed hatchery site, and outstocking locations. The proposed hatchery site is accessed from Edwards Road, an east–west roadway. To the east and running north–south is Judge Road, which is used to access Springfield Road/Idaho State Highway 39 (Idaho 39). To the west, Edwards Road connects with the north–south Crystal Springs Road, which provides direct access to the town of Springfield. All of these roadways are classified by Bingham County as local roads, and have two travel lanes. The outstocking locations likely would be accessed using state and federal highways, such as Idaho State Highway 75 (Idaho 75) and U.S. Route 93 (U.S. 93), and U.S. Forest Service roads, including Redfish Lake Road, Forest Road 208, and Alturas Creek Road.

Roadways immediately adjacent to the proposed hatchery site are rural and experience light traffic. Much of the traffic in the area consists of agricultural equipment and travel associated with the scattered rural residences. Volumes on the state and federal highways are greater

because they carry more intercity and inter-region traffic. On Idaho 39, 2010 average daily traffic ranged from 1,200 vehicles to 3,000 vehicles in the Springfield vicinity (Idaho Transportation Department 2011a). Average daily traffic on Idaho 75 in the same year ranged from 640 vehicles to 14,500 vehicles; on U.S. 93 the range was from 1,000 vehicles to 5,400 vehicles (Idaho Transportation Department 2011b). Traffic on U.S. Forest Service roads is largely recreational.

3.11.2. Environmental Consequences—Proposed Action

The Proposed Action has the potential to result in direct short-term impacts on transportation from increased traffic generated by construction vehicles. During construction, heavy trucks carrying construction materials to and from the proposed hatchery site would temporarily elevate traffic on Edwards Road and the surrounding roadways. It is estimated that approximately 1,200 truck trips would occur spread out over the 16-month construction period. Large construction equipment traveling to the proposed hatchery site may also periodically block traffic on area roadways causing very short-term delays for other vehicles, including farm equipment.

The temporary increase in construction-related traffic on adjacent roadways would represent a minor increase in daily traffic volume compared with existing roadway use and is not expected to substantially degrade traffic operations on the local roads. Although the presence of large construction vehicles or trucks containing materials could result in periodic traffic delays, potential traffic delays would be brief and infrequent. Therefore, transportation impacts during construction would be low.

During hatchery operations, eggs would be transferred to the proposed hatchery by a single delivery truck in the fall of each year. In addition, the 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. There would be no more than three truck trips per day on weekdays, with no trips on the weekends. Because of the infrequent nature of these trips and the relatively higher volume of traffic on area highways, operational traffic impacts would be low.

In addition, four new part-time jobs would be created, which would result in several commuter trips per week. Supplies would be delivered two to three times per month, with a maximum of five deliveries per month. General office and residential waste disposal would be provided by a periodic garbage pickup. These additional trips would add a small amount of daily traffic to local roadways. Because there is capacity to accommodate additional traffic in the area and because the additional trips would be minimal, these transportation impacts during operations would also be low.

No additional transportation would be required for the Proposed Action.

3.11.3. Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG will implement the following mitigation measures to avoid or minimize transportation impacts on residents.

- Provide appropriate contact information for contractor liaisons and IDFG staff to local residents for any concerns or complaints during construction.

- Keep construction activities and equipment clear of residential driveways, to the greatest extent possible.
- Employ traffic control flaggers and post signs along roads warning of construction activity and merging traffic for temporary interruptions of traffic, where needed.

3.11.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

During construction, potential unavoidable impacts would consist of minor delays and interruptions of local traffic in the study area. These short-term impacts would cease once construction is completed and are considered to be low. Some additional traffic would be generated during operation of the proposed hatchery; however, the additional traffic would be minimal and these impacts would be low.

3.11.5. Cumulative Impacts—Proposed Action

The Proposed Action would result in minimal increases in traffic during construction and operation. No known development or additional construction projects are known at this time, and the transportation facilities are adequate for existing traffic. Therefore, the Proposed Action would not result in a contribution to any cumulative impacts on transportation.

3.11.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, no improvements to the existing facilities would occur. There would continue to be low impacts from traffic associated with ongoing maintenance and operations at the hatchery site. In addition, approximately 30 trips per year for outstocking activities would generate low traffic impacts, similar to existing conditions.

3.12. NOISE AND PUBLIC HEALTH AND SAFETY

3.12.1. Affected Environment

Noise Affected Environment

The study area for noise includes the proposed hatchery site and adjoining land within 1,000 feet of the proposed hatchery site, and land within 500 feet of public roads that would be used to deliver materials to the proposed hatchery.

Noise is generally considered as sound that is loud, disruptive, unexpected, or otherwise undesirable. Environmental noise is commonly quantified in terms of ***A-weighted decibels*** (dBA), an overall frequency-weighted sound level that approximates the frequency response of the human ear. Table 3.12-1 contains examples of common activities and their associated noise levels in dBA.

Table 3.12 1. Common Activities and Associated Noise Levels

Activity	Noise Level (dBA)
Bedroom at night	25
Refrigerator	40
Moderate rainfall on vegetation	50
Normal conversation indoors	60
Gas lawnmower 100 feet away	70
Truck 10 feet away	80
Loud live band music	110

The ability to perceive a new noise source intruding into background conditions depends on the nature of the intruding sound and the background sound. For situations where the nature of the new sound is similar to the background sound (e.g., new traffic noise added to background traffic noise) a noise of 3 dBA is just noticeable, a change of 5 dBA is clearly noticeable, and a change of 10 dBA is perceived as doubling or halving sound level. For situations where the nature of the new intruding sound is different from background sound (e.g., construction noise in an otherwise quiet setting), the new sound (including sporadic "clanks" from construction equipment) can be perceived even if it only raises the overall noise level by less than 1 dBA.

Sensitive noise receptors in the study area consist of the closest off-site residences (the closest of which is roughly 2,000 feet away from the study area), and fishermen along the shoreline of Crystal Springs Pond (who could be within 100 feet of temporary construction equipment, within 300 feet of permanent water supply well pumps, and within 500 feet of the permanent hatchery equipment). The existing and proposed dwellings in the proposed hatchery site would be occupied by paid IDFG staff members, who are not considered to be noise-sensitive receptors. Existing noise sources likely consist of local agricultural operations, and traffic on local roads. Background noise levels in rural and agriculture areas are roughly 45 dBA during the day and 35 dBA at night (U.S. Environmental Protection Agency 1971).

There are no federal regulations applicable to noise generated by the Proposed Action. Idaho has not established state-wide regulations limiting noise emissions from commercial facilities. Similarly, Bingham County has not established a noise control ordinance that limits noise emissions. However, the County's zoning ordinance requires that facilities subject to Conditional Use Permits must be designed to prevent noise nuisance to nearby dwellings, and the Bingham County Comprehensive Plan specifies that new industrial development must be designed to control the negative aspects of noise.

Public Health and Safety Affected Environment—Infrastructure

The study area for infrastructure includes the earthen embankment that impounds Crystal Springs Pond, the outlet structure at Crystal Springs Pond, and the existing culvert under Edwards Road. The existing earthen embankment that impounds Crystal Springs Pond was constructed in roughly 1987, and the concrete outlet structure for Crystal Springs Pond was

constructed in roughly 2006. These structures are the only structures associated with the existing hatchery that could result in flood damage of the adjacent facilities if they were to fail.

Public Health and Safety Affected Environment—Hazardous Materials

The study area for hazardous materials includes the proposed hatchery site and adjoining land within 1,000 feet of the proposed hatchery, and land within 500 feet of public roads that would be used to deliver materials to the proposed hatchery. The study area for hazardous materials also includes surface soil and groundwater within 100 feet of the proposed hatchery boundary, and surface water in Boom Creek within 0.25 mile downstream of the facility boundary. This zone could be affected if a large fuel spill occurred at the hatchery during construction or operation.

The study area previously included a trout hatchery, which was served by cars and trucks that used fuel and also used nutrients and antibiotics that were stored on site. It is possible that minor incidental spillages of these chemicals could have occurred at the existing hatchery. Therefore, soil and groundwater beneath the existing hatchery could contain elevated concentrations of certain chemical constituents.

3.12.2. Environmental Consequences—Proposed Action

Noise Environmental Consequences

The noise analysis evaluated two sets of sensitive noise receptors: individuals in or around the closest off-site residences (the closest of which is 2,000 feet away) and onsite fishermen at Crystal Springs Pond. The loudest noise emissions would occur during temporary demolition and reconstruction of the existing hatchery facilities. Construction activity would be required within roughly 100 feet of areas used by recreational fishermen. The sound emissions produced by conventional construction equipment (expressed as dBA at a 50-foot distance) typically range from about 75 to 90 dBA, 78 dBA for a dump truck, 80 dBA for an excavator, 85 dBA for a backhoe, and 87 dBA for a bulldozer (Federal Transit Administration 2006).

The intensity of sound attenuates, or diminishes, by about 7.5 dBA as distance doubles or where vegetation is present to absorb noise (Federal Transit Administration 2006). The zone of effect is considered to extend from the source of the noise to the point at which the noise attenuates to ***ambient*** or existing background levels.

Based on the Federal Transit Administration spreading noise model for attenuation over distance, assuming an ambient noise level of 45 dBA, a bulldozer operating at the hatchery site (87 dBA at 50 feet) could be discernible above ambient noise from about 1,000 to 2,000 feet away from the construction zone. The closest residences are more than 2,000 feet from the proposed construction zone. Therefore, it is unlikely the temporary construction noise would be discernible at the closest off-site residences and noise impacts on residents would be low. The existing and proposed onsite residences would be occupied by paid IDFG staff, so they are not considered to be sensitive noise receptors.

Fishermen at Crystal Springs Pond could be within 100 feet of the closest construction zones (i.e., trenching activity for the new water supply piping). Noise emissions from a typical trenching device are roughly 80 dBA at a 50-foot reference distance, so fishermen close to the temporary trenching might be exposed to 73 dBA. Trenching activity near the shoreline might also temporarily scare fish away from the immediate vicinity, but the fish would presumably return to the area soon after the construction activity was completed. Large construction equipment at the main hatchery facility would be as close as 500 feet from the closest fishermen. A bulldozer or large excavator at the hatchery would generate noise levels of roughly 85 dBA at a 50-foot reference distance, so fishermen closest to that facility would be exposed to temporary noise levels of roughly 62 dBA. Construction noise levels during pipeline trenching activity along the south shoreline of Crystal Springs Pond would be noticeably elevated above existing conditions and potentially disruptive to recreational fishermen; however, these impacts would be temporary and limited to localized areas near the trenching activity. Therefore, the temporary noise impacts on recreationists during construction would be moderate.

The permanent noise sources during facility operations would include small wellhead pumps supplying artesian spring water to the facility; large recirculation pumps at the hatchery facility; mechanical water-chilling equipment at the hatchery facility; a 500-kilowatt (kW) diesel-powered backup generator (that would be tested occasionally during normal business hours); and occasional trucks traveling on public roads either delivering supplies to the hatchery or carrying smolts to the receiving waters. The wellhead water supply pumps for the proposed hatchery would either consist of normal agricultural in-well turbine pumps that are inherently quiet, or at-grade centrifugal pumps inside weather enclosures that include noise reduction. The large recirculation pumps, backup generator, and the mechanical water chillers at the hatchery would likely be inside the building or in dedicated weather/acoustical enclosures. These acoustical enclosures would reduce ambient noise levels at sensitive-noise-receptors to near-background levels, so their noise impact would be low (see Section 3.12.3, Mitigation, for recommended acoustical specifications for the weather enclosures). Proposed Action-related truck traffic volumes on public roads close to existing residences would be a small fraction of the background traffic volumes, so the Proposed Action would cause only a small increase in roadway noise. Therefore, the permanent noise impacts during operation would be low.

Public Health and Safety Environmental Consequences—Infrastructure

The Proposed Action would not modify the existing earth embankment that impounds Crystal Springs Pond, nor would it alter the water depth or storage volume in the pond. Therefore, the Proposed Action would not affect the structural stability of the existing embankment, nor would it increase the potential risk of failure of that embankment during a major earthquake.

New raceways for the Proposed Action would be constructed by excavating within the existing raceways in level ground, then constructing structural concrete basin walls within the excavation. This type of construction would not be subject to earthquake-related failures that could cause the raceway contents to flood into nearby streams. Potential earthquake-related failure of buildings would be prevented by constructing the buildings according to the seismic building codes described in Section 3.8, Geology and Soils.

Because of these considerations, the Proposed Action would not result in impacts related to potential safety risks caused by infrastructure failure.

Public Health and Safety Environmental Consequences—Hazardous Materials

Construction and operation of the Proposed Action would require the use and storage of potentially hazardous materials that could pose safety risks to the human and natural environment if they were accidentally spilled. Construction-related activities would require the use of diesel fuel for construction equipment, paints and solvents, and cement and asphalt. In addition, lead-based paint could be encountered during demolition of the existing structures. Operation of the proposed hatchery would likely require the use of vehicle fuel, iodophor, formalin, and antibiotics.

As described in Section 3.5, Water Quality, an NPDES permit would be required for construction-related activities and operation. The terms of this permit would require implementation of a Stormwater Pollution Prevention Plan (SWPP Plan), which would include a Spill Control, Containment and Countermeasures Plan (SPCC Plan). The SPCC Plan would require all potentially toxic materials to be stored and used in a manner that minimizes the potential for accidental spills. In addition, the SPCC Plan would include measures for appropriate and timely cleanup of any spills. Therefore, after implementation of this federally required practice, risk of exposure from spills would be low.

Under operational conditions, potentially hazardous chemicals would be stored according to the SPCC Plan, applicable county building codes, and federal regulations for fuel storage tanks. Because these chemicals will be stored in a manner to prevent spills from occurring and in a manner that prevents any spilled material from migrating into soil or water, the potential safety impacts of using these chemicals would be low.

3.12.3. Mitigation—Proposed Action

Noise Mitigation Measures

If the Proposed Action is implemented, IDFG will implement the following mitigation measures to avoid or minimize noise impacts.

- Limit noise emissions from the wellhead water supply pumps to no more than 69 dBA at a 50-foot reference distance.
- Limit outdoor noise emissions from the proposed hatchery's water recirculation pumps and mechanical water chillers to no more than 73 dBA at a 50-foot reference distance.
- Limit outdoor noise emissions from the backup diesel generator to no more than 73 dBA at a 50-foot reference distance.
- Employ a liaison who would be available to provide information, answer questions, and address concerns during project construction.
- Schedule all construction work during daylight hours.
- Locate stationary construction equipment as far away from noise-sensitive receptors as possible.

- Require sound-control devices on all construction equipment powered by gasoline or diesel engines that are at least as effective as those originally provided by the manufacturer.
- Operate and maintain all construction equipment to minimize noise generation.

Public Health and Safety Mitigation Measures—Infrastructure

No mitigation measures are required.

Public Health and Safety Mitigation Measures—Hazardous Materials

If the Proposed Action is implemented, IDFG will implement the following mitigation measures to minimize impacts from hazardous materials:

- Implement the SPCC Plan that is required to prevent chemical spills under the NPDES permit. Store flammable and potentially toxic chemicals in designated areas designed to contain any accidental spills.
- Prepare a Safety Plan in compliance with state requirements before starting construction; specify how to manage hazardous materials, such as fuel and any toxic materials found in work sites; include a Fire Prevention and Suppression Plan, and detail how to respond to emergency situations. Keep the Safety Plan on site during construction and maintain and update, as needed.
- Require the construction contractor to hold safety meetings with workers at the start of each work week to review potential safety issues and concerns.
- Require monthly meetings, attended by the construction contractor and IDFG staff, to discuss safety issues.
- During operation, store flammable and potentially toxic chemicals in designated areas designed to contain any accidental spills.

3.12.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

The potential noise and public health and safety impacts would be minimized after the implementation of the mitigation measures described above; however, certain impacts are unavoidable. Temporary construction-related noise impacts affecting recreationalists at Crystal Springs Pond would be moderate. In addition, although the potential for exposure to hazardous materials would be minimized, a low risk from accidental spills during construction and operation would remain.

3.12.5. Cumulative Impacts—Proposed Action

There are no major construction projects planned for the immediate vicinity near the proposed hatchery. Because noise dissipates rapidly with distance and contaminant spills generally affect areas close to the spill site, the contribution of the Proposed Action to cumulative noise and public health and safety impacts would be low.

3.12.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing hatchery would not be modified. Recreational use of Crystal Springs Pond and maintenance of the existing hatchery facilities would continue similar to existing conditions. Therefore, there would be no change from current levels of noise or public health and safety impacts under the No Action Alternative, which would continue to be low.

3.13. SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.13.1. Affected Environment

Socioeconomics

The study area for socioeconomics consists of two economic areas, which are regions defined by the Bureau of Economic Analysis (BEA) for which socioeconomic data is organized according to markets for labor, products, and other economic information (Johnson and Kort 2004). The two Economic Areas that could be affected by the Proposed Action include Economic Area-77, Idaho Falls and Economic Area-172, Twin Falls (Bureau of Economic Analysis 2009). Economic Area-77 comprises the counties of Bingham, Bonneville, Butte, Clark, Custer, Fremont, Jefferson, Lemhi, and Madison. Economic Area-172 comprises the counties of Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls. The proposed hatchery site and Redfish Lake are located within Economic Area-77. Alturas and Pettit lakes are located in Economic Area 172.

Population and Housing

Economic Area-77 and Economic Area-172 had 2009 estimated populations of 237,794 and 179,994, respectively (U.S. Census Bureau 2009a). Combined, these two areas make up 27% of the state's population. The largest city in the combined area is Idaho Falls, which is located in Bonneville County. It had a population of 50,730 in 2000. From 2000 to 2009, Economic Area-77 grew at an estimated combined rate of about 2% and Economic Area-172 grew at an estimated combined rate of 1%, compared with 2% population growth for the state as a whole during the same period (U.S. Census Bureau 2009a). The proposed hatchery site is located in Bingham County, which had a 2009 population of 44,668 and grew at a rate of 0.7% from 2000 to 2009.

There are over a dozen hotels and motels in the nearby city of Pocatello, as well as campsites and recreational vehicle (RV) parks in the nearby cities of Aberdeen and Pocatello. As indicated previously, there is one residence located in the proposed hatchery site, which is currently occupied by an IDFG employee and there are numerous rural residences scattered in the surrounding area.

Employment and Income

About 302,374 people age 16 and over were employed in some capacity in the study area in 2009 (Bureau of Labor Statistics 2009). The unemployment rate in the study area in 2009 was 6.6%. In 2009, per-capita personal income in the study area was $30,823, or 78% of the average for Idaho (Bureau of Economic Analysis 2009).

The main industries in the study area are wholesale and retail trade, government services, professional services, and farming (Bureau of Economic Analysis 2011). Employment in industries that support recreation and tourism, including sportfishing, represents a smaller proportion of the overall study area, about 8% of employment and 2% of income, but comprise a somewhat larger share of the jobs and income in parts of the study area.

Government Revenue

Property tax provides a notable source of revenue for Bingham County. IDFG owns the property for the proposed hatchery location and is exempt from paying property taxes; however, IDFG pays a fee in lieu of taxes (FILT) for this property. IDFG's most recent FILT payment to Bingham County (for Tax Year 2010) was $6,277 (Martin pers. comm.). The county also receives sales tax disbursements from the state.

Economic Value of Fish

As described in Chapter 2, Project Alternatives, sockeye salmon from the proposed hatchery would be delivered into outstocking locations, which are located in Custer and Blaine counties. For this reason, these counties are discussed in greater detail below with respect to potential impacts associated with commercial and recreational fisheries.

Economists estimate the value of fish in several ways:

- its market value, when people pay money to purchase commercially caught fish;
- its non-market value, measured through anglers' expenditures on trips and equipment to participate in recreational fishing and through the difference (i.e., ***consumer surplus***) between what they are willing to spend and what they actually spend; and
- its non-market value to people who are willing to pay to ensure the long-term survival of the species for their own or future generations' well being (i.e., ***existence and bequest value***).

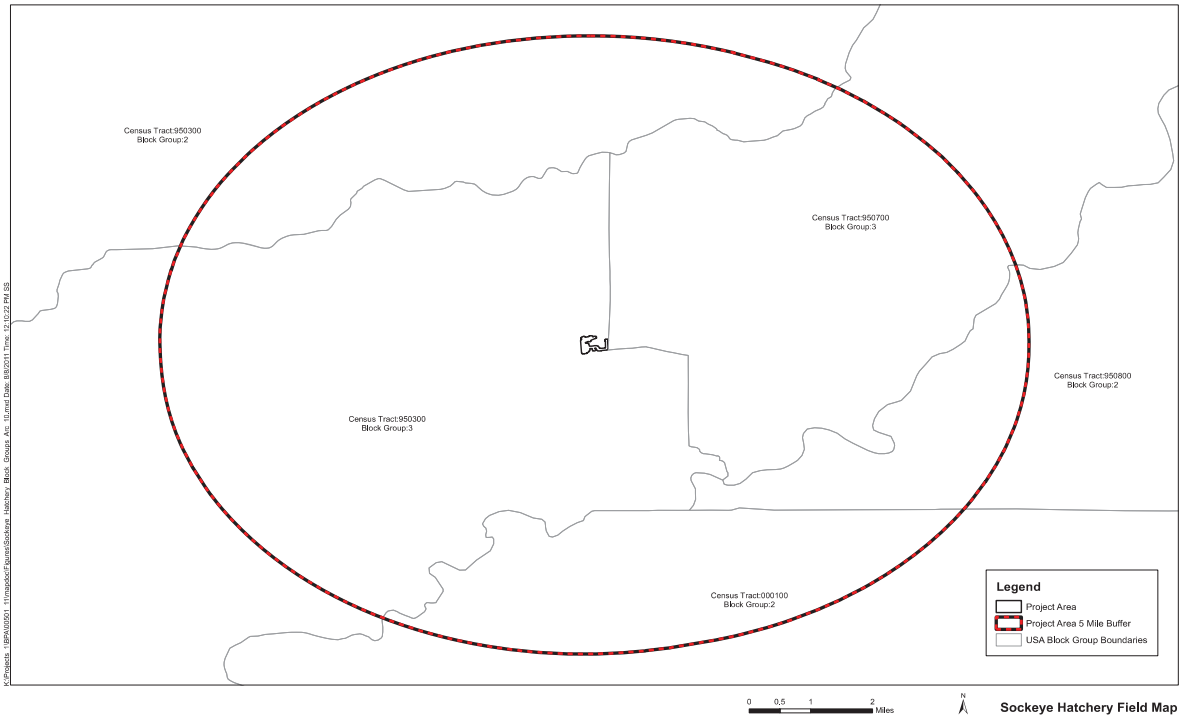
Consumer surplus is important because it registers improvements in economic well-being: if someone can pay just a little to enjoy a fishing experience worth more, then he or she is economically better off. Custer and Blaine counties rank in the top 10 for sport fishing, based on angler spending. In 2003, there were an estimated 107,984 sportfishing trips in Custer County and 89,035 trips in Blaine County; anglers spent an average per trip of $304 and $197, respectively (Idaho Department of Fish and Game 2004). The average consumer surplus per person per day fishing in the study area is about $59 (Loomis 2005, adjusted to 2010 dollars).

Existence and bequest value are more difficult to measure, but several studies have estimated that, depending on the magnitude of increases in salmon populations in the Columbia River and Snake River systems, household willingness to pay ranges from $84 to $635 per year (Loomis 1999, adjusted to 2010 dollars).

Environmental Justice

The study area for environmental justice is a 5-mile radius surrounding the proposed hatchery site. The study area overlaps with five census block groups as shown in Figure 3.13-1.

Figure 3.13-1. Environmental Justice Study Area



Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, issued by President Clinton in 1994, requires that each federal agency develop an environmental justice strategy that identifies and addresses "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (59 Federal Register 7629 [February 11, 1994]). The president specifically directed agencies to analyze the effects of potential actions on minority and low-income communities through the NEPA review process (Council on Environmental Quality 1997).

The Council on Environmental Quality (Council on Environmental Quality 1997) directs environmental justice analyses to consider concentrations of ethnic and racial minority populations and low-income populations that the Proposed Action could affect. Geographic areas where ethnic and racial minorities exceed 50% of the population must be identified. Geographic areas where the percentage of the ethnic and racial minority population is "meaningfully greater" than the percentage in the surrounding area should also be identified. Low-income populations are identified using the U.S. Census Bureau's definition of a poverty area, where 20% of the population is below the federal poverty level, based on their income in 1999 (U.S. Census Bureau 2009b).

Minority Populations

For the purposes of this analysis, minority populations consisting of Latino/Hispanic origin, American Indian, and two or more races were determined in the environmental justice study area. As indicated by the data and summarized in Table 3.13-1, block groups 9508/2 and 0001/2

Table 3.13-1. Minority and Low-Income Populations

Census Tract/Block Group	Percent (%) Minority	Percent (%) Low Income
9503/2	5	**22**
9503/3	0	3
9507/3	10	18
9508/2	**82**	**32**
0001/2	**48**	18
Idaho State	11	14
Bingham County	16%	15%

Source: U.S. Census Bureau 2009a, 2009b.

have large minority populations, 82% and 48%, respectively, when compared to the state population as a whole at about 11%. This is largely a result of the Native American population in the nearby Fort Hall Indian Reservation.

Low-Income Populations

The U.S. Census Bureau uses a set of dollar value thresholds that vary by family size and composition to determine the poverty level. In 2009, block groups 9503/2 and 9508/2 had income below the poverty level, as compared to 14% of the statewide population (U.S. Census Bureau 2009b).

3.13.2. Environmental Consequences—Proposed Action

Socioeconomics

Population and Housing

Because construction activities associated with the Proposed Action would occur in phases over approximately 16 months, it is not anticipated that the duration of construction work would be long enough to induce any permanent changes to population in the study area. Construction would require approximately 16 workers. Most of the construction workforce likely would come from Boise and reside temporarily within the project vicinity. These workers would have an indiscernible effect on the overall population of the study area. The workers from out of the area would require temporary lodging in the local area during the 16-month construction period. Construction workers likely would occupy RV parks and hotel/motels of which there is expected to be sufficient temporary lodging to accommodate this small increase in demand over the construction period. Therefore, the potential for impacts on population and housing from construction would be low.

Operation of the proposed hatchery would require four permanent employees and four part-time employees. Assuming these positions are hired from people currently residing outside of the study area, the Proposed Action would result in a very small increase in the study area's population, relative to its current population. Even if all workers move to the study area with

dependents, they would have an indiscernible effect on the study area population. Permanent employees would live in onsite housing to be constructed as part of the Proposed Action. The increase in demand for permanent housing from any workers not housed on site would not have a discernable effect on the supply of housing in the study area. Therefore, the potential for impacts on population and housing from operation would be low.

Employment and Income

As discussed above, the temporary increase in jobs during construction would represent a very small proportion of the current workforce in the study area. Therefore, the temporary impact on the labor market in the study area would be virtually indiscernible and would be very low. For those people who obtain construction jobs, especially if they are currently unemployed, the individual impact would be positive.

Construction of the Proposed Action is expected to cost $12.7 million. This cost would include expenditures on materials and equipment and expenditures on labor, some of which would be spent locally in the study area. These local expenditures would have ripple effects on the economy, as workers and businesses receiving income would re-spend some of the money locally, the workers and businesses who receive that money would also re-spend some locally, and so on. These direct and indirect expenditures would represent a very small proportion of the total annual income in the study area, and the impact would be temporary and low.

During operation, the Proposed Action would employ the equivalent of four people full-time per year. An additional four part-time jobs would be created and would be staffed by employees who would commute from the surrounding area. This increase in employment would not have a discernable long-term effect on the labor market in the study area, but would represent a positive impact for those people who receive jobs, especially if they would otherwise be unemployed. This potential for this impact, while positive, would be very low.

Government Revenue

The Proposed Action would have no impact on property taxes, because the land would continue to be owned and operated by IDFG, which is exempt from paying local taxes. The Proposed Action may change the status of some parts of the property from being subject to FILT to being exempt. Based on the current county tax rate (from which the FILT payment is derived), IDFG's current FILT payment would decrease by approximately $177 if this change in status occurs (Martin pers. comm.). The Proposed Action also may generate a small increase in sales tax revenue to the state from purchases by the contractor and by the workers. This could result in a small increase in the amount of sales tax revenue disbursed to Bingham County by the state. The potential for impacts associated with changes in government revenue would be low.

Economic Value of Fish

The Proposed Action is expected to produce between 500,000 and 1 million sockeye salmon each year. At some future date, these additional fish could increase both the quantity and quality of fishing opportunities in the outstocking locations. This could provide economic benefits to the economy through increased expenditures on recreational fishing. It also could provide benefits to the larger economy of the Pacific Northwest region by improving commercial and recreational

fishing throughout the Columbia and Snake River systems. To the extent that the increases in fish improve the quality of the existing fishing opportunities and create new opportunities, it could generate more consumer surplus for individual anglers, improving their overall economic wellbeing. To the extent that the increased fish populations improve the long-term health and resilience of Idaho's Snake River Sockeye runs, the Proposed Action could improve the economic wellbeing of people who care about their continued survival. While the socioeconomic impacts would be beneficial, they would be low.

Environmental Justice

The potential impacts associated with construction of the Proposed Action would primarily affect the immediate area surrounding the proposed hatchery site. There may be some disruptions to traffic and from noise and construction dust that could occur in the area immediately surrounding construction, but impacts would be borne equally by all and would not disproportionately affect environmental justice populations. Operation of the Proposed Action would have some low impacts associated with water quality and low beneficial effects associated with fishing opportunities; however, similar to construction impacts, operational impacts would not disproportionately affect environmental justice populations. The Shoshone Bannock tribes, which would benefit from the increased production of fish, are partners and supporters of the sockeye recovery effort. Therefore, the potential for impacts disproportionately affecting environmental justice populations would be low.

3.13.3. Mitigation—Proposed Action

As discussed above, most socioeconomic impacts would be indiscernible and potentially positive and no impacts on environmental justice populations are expected. Therefore, no mitigation for socioeconomics or environmental justice populations is anticipated.

3.13.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

Minor socioeconomic impacts could occur as a result of the Proposed Action associated with small temporary increases in the demand for housing, negligible changes associated with government revenue, and minor beneficial impacts associated with commercial and recreational fisheries.

3.13.5. Cumulative Impacts—Proposed Action

Other construction projects in the study area have resulted in minor contributions to the local economy. In addition, these projects have also resulted in some construction-related impacts that could temporarily affect population and housing, employment and income, government revenue, and environmental justice populations. Because the impacts of the Proposed Action would largely be temporary and low, the Proposed Action would not noticeably contribute to a cumulative impact on population and housing, employment and income, government revenue, and environmental justice populations.

3.13.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing hatchery would remain in its current state; therefore, impacts related to construction would not occur and would not generate any impacts on population and housing or government tax revenue compared with existing conditions. The onsite caretaker would continue to live and maintain the property, but no additional jobs would be created, and the socioeconomic impacts would be low. Similar to the Proposed Action, there would be low to no impacts that would disproportionately affect environmental justice populations.

3.14. PUBLIC FACILITIES AND SERVICES AND ENERGY

3.14.1. Affected Environment

Public Facilities and Services

The study area for public facilities and services includes Bingham County. Services in this analysis include emergency services, waste disposal services, water supply and treatment, and schools.

The Aberdeen/Springfield Fire District (ASFD) and Blackfoot/Snake River Fire District (BSRFD) provide fire-protection services to the study area. The Shelley/Firth Fire District, Bonneville Fire District, and the Fort Hall Fire District provide fire-protection services elsewhere in Bingham County, and have mutual aid agreements with the ASFD and BSRFD in the event that additional support is required. The ASFD has two stations and approximately 30 trained firefighters and emergency medical technicians (EMTs), who are all volunteer staff. The ASFD responds to both structural and wildland fires and provides emergency-medical services, but does not provide response for emergencies involving hazardous materials (hazmat). The BSRFD has 24 full-time employees, nearly all of which are EMT certified, and 10 to 15 of which volunteers. It provides wildland and structural fire-protection, emergency-medical services, and hazmat response.

The Bingham County Sheriff's Office provides law-enforcement services in Bingham County. The sheriff's office has 83 officers, 28 of whom are sworn deputies. There is one jail facility in the County. The Idaho State Police provide additional patrols and enforcement on the interstate, state, and secondary highways in the study area, and works with the sheriff's office to perform other law-enforcement duties as required. The closest incorporated community, the city of Aberdeen, also has a police department.

Bingham Memorial Hospital provides emergency medical services in Bingham County. Two other hospitals and four urgent care centers in Bingham County also provide non-emergency medical care. The nearest Level II Trauma Center, Eastern Idaho Regional Medical Center (EIRMC), is located approximately 45 miles away in the city of Idaho Falls, in Bonneville County. Air Idaho Rescue provides emergency flight services for critical illness and injury from Bingham County to EIRMC.

Household waste is handled through Bingham County municipal waste services, including a Central Transfer Station located in the city of Moreland, from which waste is hauled to either the Bannock County Landfill or Milner Butte Landfill in Cassia County, near the city of Twin Falls. Commercial demolition waste is handled through the Aberdeen Construction & Demolition Site.

Potable water is supplied to the study area via one of the nine artesian wells consistent with IDFG's existing water rights. Wastewater associated with the existing hatchery (the residence and office buildings) is treated by an onsite sewage treatment and disposal system.

Five school districts provide education for pre-kindergarten through twelfth grade. Several private schools also operate in the county. There are no schools located within the immediate vicinity of the study area.

Energy

The study area for energy includes the service area that encompasses the Proposed Action, which includes southern Idaho and eastern Oregon. Electricity is provided to the service area by Idaho Power, which serves 487,000 customers in southern Idaho and eastern Oregon. In 2010, Idaho Power sold 16,745,000 megawatt hours of electricity to its customers (Idaho Power 2011).

Diesel fuel and gasoline for construction equipment and delivery trucks is refined and distributed by several refineries in the mountain states region. In 2009, approximately 312 million gallons of Number 2 diesel fuel were sold in Idaho (Energy Information Administration 2011).

3.14.2. Environmental Consequences—Proposed Action

Public Facilities and Services

The Proposed Action could affect the supply of and demand for public facilities and services in the study area during both construction and operation. However, the potential impacts are likely to be small or indiscernible, relative to the current level of service.

Construction activities would result in minor temporary increases in construction-vehicle traffic on the county's roads. Increased traffic with large trucks and heavy loads could create local disruptions that could increase the demand for law-enforcement services. Potential injuries or accidents during construction and operation could also increase demand for law enforcement, fire-protection, or emergency medical services.

Immediate response to accidents related to the Proposed Action would be the primary responsibility of the Bingham County Sheriff's Office and the ASFD. If an emergency involved hazardous materials, the BSRFD or Fort Hall Fire District would be called to respond with a hazmat team. The likelihood of such an event is low and would be within the abilities of these service providers to respond (Aiklie pers. comm.; Manring pers. comm.; Sobieski pers. comm.; Valentine pers. comm.). Potential impacts on emergency service response would be low.

Construction activities would also generate construction and demolition waste. During operation, the Proposed Action would generate residential and office waste, which would be handled through Bingham County's municipal waste services. It also would generate non-

household solid waste that would be disposed of off site according to EPA requirements. Local landfill sites and transfer stations are currently not at capacity and would be able to handle additional waste (Prouse pers. comm.), so the Proposed Action would not have a long-term impact on the capacity of landfills to handle either household or other waste. Impacts would be low.

The Proposed Action would result in increased demand for potable water and wastewater treatment. However, potable water would be provided via one of the existing artesian wells consistent with IDFG's water right. Potential effects on groundwater would be low and are discussed further in Section 3.5, Water Quality and Water Quantity. Sewage associated with the proposed hatchery (i.e., residences and hatchery building) would be treated via onsite treatment and disposal systems. Water treatment associated with proposed hatchery effluent would be treated on site prior to discharge. Therefore, potential impacts on the provision of services associated with water supply and water treatment would be low.

Because the Proposed Action is unlikely to have a discernible effect on the study area's population, either during construction or operation, there would be low to no effects on population-dependent services, such as schools.

Energy

Construction of the Proposed Action would use approximately 66,000 gallons of diesel fuel for off-road construction equipment and haul trucks. Operation of the proposed hatchery would use an average of 6,300 gallons per year of diesel fuel for on-road vehicles. These required diesel fuel purchases are only a small fraction of the 312 million gallons of diesel fuel that were sold in Idaho in 2009. Therefore, construction and operation of the Proposed Action would have a low impact on the availability of diesel fuel in Idaho.

Operation of the Proposed Action would require an average of 1,850 megawatt hours of electricity from Idaho Power. That required electricity purchase is a small fraction of the 16.7 million megawatt hours of electricity that were sold in Idaho in 2010 (Idaho Power 2011). Therefore, operation of the Proposed Action would have a low impact on Idaho's electricity availability. The mitigation measures proposed below would further reduce energy consumption by approximately 15% to 20%.

3.14.3. Mitigation—Proposed Action

Public Facilities and Services

If the Proposed Action is implemented, IDFG will implement the following measures to avoid or minimize impacts related to public facilities and services:

- Coordinate with local law enforcement, fire protection, and other emergency responders to ensure they are prepared to address any emergencies that may arise during construction and operation.
- Coordinate the routing and scheduling of construction traffic with the relevant county and state road staff to minimize interruptions to local traffic.

Energy

If the Proposed Action is implemented, IDFG will implement the following measures to avoid or minimize impacts related to energy:

- Where possible, use high-efficiency light fixtures (e.g., LED, compact fluorescent, high-efficiency fluorescent bulbs).
- Where possible, install automatic lighting controls, including occupancy sensors and lighting control panels.
- Use skylights, windows, and/or opaque wall panels for natural lighting of the large early rearing room and occupied spaces.
- Use chilled water energy recovery via water-to-water heat exchangers.
- Use premium efficiency pump motors on process water systems and heating, ventilation, and air conditioning (HVAC) units.
- Use artesian well water flow for the proposed hatchery water supply to the greatest degree practical.
- Install low-flow plumbing fixtures for domestic uses to reduce well pumping.
- Install a central flow monitoring and control system.

3.14.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

There would be no unavoidable impacts from the Proposed Action remaining after mitigation. Although minor increases in the demand for public services and energy would remain, these impacts would be low and would be adequately supplied as discussed above.

3.14.5. Cumulative Impacts—Proposed Action

Other projects in the study area, including the Fort Hall Habitat Restoration Project, Salmon River Habitat Restoration Project, the Crystal Springs Hatchery Project, and Lost Trout Farms Project, have resulted in low impacts on local public services and energy consumption. Because the impacts of the Proposed Action would be low and existing capacity for the provision of public services and energy exists, the Proposed Action would not noticeably contribute to a cumulative impact on public facilities and services or energy use.

3.14.6. Environmental Consequences—No Action Alternative

Under the No Action Alternative, no improvements to the existing hatchery would be made. Some operation and maintenance activities could result in low impacts on public facilities and services from ongoing operation of the Snake River Captive Broodstock Program. These impacts would be similar to those described above. Energy use would continue similar to existing conditions and would be met by existing energy supplies.

3.15. AIR QUALITY

3.15.1. Affected Environment

Air Quality

The study area for air quality includes the proposed hatchery site, parcels adjacent to the proposed hatchery site, which could be affected by fugitive dust during construction, and areas adjacent to public roads that would be used by project-related delivery trucks. The entirety of Bingham County is also included in the air quality study area because regional air quality could be affected by cumulative emissions from all sources within the county.

EPA and IDEQ both have responsibility for air quality in the state of Idaho. Under the Clean Air Act, EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution (U.S. Environmental Protection Agency 2011a; 42 USC 4701 *et seq.*). These standards focus on criteria pollutants, which are pollutants of particular concern for human health and the environment.

The key air pollutants of concern for the study area and the Proposed Action are listed below.

- **Particulate matter.** Particulate matter is generated by industrial emissions, residential wood combustion, motor vehicle tailpipes, and fugitive dust from roadways and unpaved surfaces. Two forms of particulate matter are regulated by EPA: particulate matter less than 10 micrometers in size (PM10) and particulate matter less than 2.5 micrometers in size (PM2.5). PM2.5 has a greater health effect than PM10 at locations far from the emitting source because it remains suspended in the atmosphere longer and travels farther. IDEQ does not monitor particulate matter in the study area. PM 10 and PM2.5 concentrations in the study area are likely to be less than the NAAQS because the area is sparsely developed and traffic levels are relatively low.
- **Ozone.** Ozone is primarily a product of more concentrated motor vehicle traffic during warm, sunny weather. Ozone would not be emitted by the proposed hatchery, but it would form in the atmosphere via a reaction of substances emitted by the facility (nitrogen oxides and volatile organic compounds from equipment such as backup generators, oil-fired space heating, gas stoves in the residences, lawnmowers, and tailpipes from commuter vehicles and haul trucks). Ozone is a regional pollutant caused by an atmospheric photochemical reaction of cumulative emissions. IDEQ does not monitor ozone in the study area. Ozone concentrations in the study area are likely to be less than the NAAQS limits because the area is sparsely developed and traffic levels are relatively low.

In addition to the above criteria air pollutants, the Proposed Action would also emit carbon monoxide and sulfur dioxide. These criteria pollutants would be emitted at low rates that have little potential to cause ambient concentration issues at the facility boundary or at nearby recreational areas.

Existing localized sources of criteria pollutants in the study area include vehicles on state and local highways, residential home heating (particularly wood burning), agricultural practices (particularly tilling, outdoor burning and re-suspension of dust and fine particles), and re-suspension of road dust from traffic on unmaintained roadways. Regional air pollutant concentrations in Bingham County are generated by the urbanized area near Pocatello and by traffic on regional interstate freeways.

Bingham County is in attainment with the NAAQS (Idaho Department of Environmental Quality 2011). This means that the concentrations of criteria pollutants in the area are historically below (i.e., in attainment with) the limits described in the NAAQS. Attainment status is a federal designation determined by EPA based on the NAAQS. Because the Proposed Action would occur in an area that is currently in attainment for meeting the NAAQS and because no stationary sources of air emissions would occur, construction activities associated with the Proposed Action are exempted from state regulation.

Background Information on Climate Change

Greenhouse gases are chemical compounds in the atmosphere that absorb and trap infrared radiation as heat, which causes warming of the planet through a greenhouse-like effect. Human activities are causing an increase in atmospheric concentrations of GHGs. Increasing concentrations of GHGs could increase the earth's temperature up to 7.2 degrees Fahrenheit (°F) by the end of the 21st century (U.S. Environmental Protection Agency 2010).

The principal GHGs emitted through human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (U.S. Environmental Protection Agency 2010). Each of these GHG constituents exhibits its own "global warming potential." CO_2 is the most prevalent GHG emitted, so the emission rates for a mixture of GHG constituents is commonly combined into the equivalent amount of CO_2 or CO_2 equivalents (CO_2e). The burning of fossil fuels accounts for 81% of all GHG emissions in the United States. CO_2 enters the atmosphere as a result of land use changes; burning of fossil fuels, including coal, natural gas, oil, and wood products; and manufacturing of cement. By 2005, CO_2 levels had increased to 379 parts per million, a 36% increase, compared with pre-industrial levels of 280 parts per million, as a result of human activities (Intergovernmental Panel on Climate Change 2007). Appendix D provides additional information on CO_2 and other GHGs, including GHG emission calculation assumptions and methods.

Global atmospheric GHG concentrations are a product of emissions (release) and removal (storage) over time. Soils store carbon in the form of decomposing plant material, serving as a carbon reservoir on land. When soils are disturbed during construction, GHG emissions are released from the soil (Build Carbon Neutral 2010).

Trees and forests play an important role in the release and storage of carbon. Through photosynthesis, trees and other plants capture atmospheric CO_2 and store carbon in the form of sugars. As trees grow, they remove more carbon from the atmosphere. As they decay, or if they burn, this stored carbon is released back into the atmosphere. Under natural conditions, most dead trees are replaced with a new tree that grows in its place, creating a cyclical pattern of carbon storage and release. Loss of carbon storage in soil occurs when a vegetated area becomes permanently unvegetated (e.g., when it is developed with buildings or roads).

Federal Guidance for Climate Change Evaluations

EPA's mandatory reporting threshold for annual CO_2 emissions from stationary industrial sources is 25,000 metric tons of CO_2e. This threshold is roughly the amount of CO_2 generated annually by 4,400 passenger vehicles. If the industrial facility's emissions exceed this threshold, then the facility is required to report its GHG emissions to EPA, but the facility is not required to take any other action at this time (40 CFR 86, 87, and 89).

In 2010, the CEQ issued draft guidance for how federal agencies should address GHG emissions and climate change impacts in EAs and EISs (Council for Environmental Quality 2010). The guidance recommends the following:

- Federal agencies should estimate direct GHG emissions. If the direct emissions exceed 25,000 tons per year, the agency should consider conducting a rigorous climate change evaluation for the project. CEQ emphasizes that 25,000 tons per year is not an impact threshold but only an "evaluation threshold" that might warrant more rigorous evaluation.
- Federal agencies should consider the potential impacts of future climate change on the operation of a proposed action. For example, if a proposed action requires a reliable water supply source, the environmental document should consider whether future decreases in available water resources could affect the proposed action.

3.15.2. Environmental Consequences—Proposed Action

Air Quality

Air pollutant emissions would be generated during the temporary construction phase and long-term operational phase of the proposed hatchery. In significant amounts, these pollutants could be a public health hazard, especially for people with respiratory ailments; and could reduce visibility on roads, highways, and in scenic areas, to the detriment of public safety or enjoyment. In addition, vehicle emissions and combustion of fossil fuels during project operations as well as during construction could emit greenhouse gases.

Construction

Typical air pollutants from construction sites include fugitive dust, vehicle emissions, and particulate emissions from activities such as burning of cleared vegetation. Given the rural setting of the study area, the criteria pollutants that could increase as a result of project construction activities are carbon monoxide, ozone, and particulate matter. An increase in fugitive dust particulate matter would be the main air quality concern. Fugitive dust could be created during construction, travel on unpaved surfaces, and other ground-disturbing activities. Although construction activities could increase dust and particulate levels, impacts would be low because they would be temporary and would occur in localized areas. Particulate matter levels would be reduced by spraying water on unpaved surfaces. The closest neighboring buildings are roughly 2,000 feet from the proposed hatchery, so the small amounts of fugitive dust generated during the construction process would disperse to levels lower than the NAAQS. For these reasons, the temporary fugitive dust impacts during construction would be low.

The operation of heavy equipment during construction could result in temporary increases in carbon monoxide, carbon dioxide, sulfur oxides, oxides of nitrogen, and volatile organic hydrocarbons. The increase in vehicle emissions from construction equipment would be temporary and localized to specific work areas, and would change on a daily or weekly basis. The increase in vehicle and equipment emissions likely would be relatively small comparable to current emission levels found in agricultural and nearby rural areas. For these reasons, impacts on air quality from tailpipe emissions during construction activities would be low.

Operations

Air quality could be slightly affected during operation and maintenance of the proposed hatchery. Vehicle emissions resulting from periodic deliveries to the proposed hatchery and from shipments of smolts to the receiving locations would be temporary and localized. Grass and brush growing in and along the unpaved roadways would be maintained using a range of control methods, including manual removal, mechanical removal, or chemical removal. Vegetation may occasionally be burned off, but the amount of burning done at any one time would be small, and it is unlikely the smoke generated by this limited burning would cause air quality issues beyond the proposed hatchery boundary. For these reasons, impacts on air quality from operation and maintenance activities would be low.

Small amounts of organic, potentially odorous wastes (e.g., liquid waste containing fish feces and uneaten fish food) would be generated during operation of the proposed hatchery. These wastes would be stored only for limited periods of time to minimize their potential to generate odorous emissions. The collected wastes would be shipped off site for either disposal or reuse as a soil conditioning agent by local farmers. The closest neighboring homes are roughly 2,000 feet from the proposed hatchery, so odor impacts during operation would be low.

GHG Emissions from Proposed Action

Construction and operation of the Proposed Action could generate increased emissions of GHG from the following activities:

- During construction ("soil carbon" emissions produced through the removal or disturbance of natural vegetation and soils).
- During construction (tailpipe emissions from gasoline- and diesel-powered vehicles, including cars, trucks, construction equipment, and helicopters).
- During operation and maintenance (tailpipe emissions from gasoline- and diesel-powered vehicles for employee commuting, supply deliveries, and transport of smolts to the receiving waters).
- During operation (indirect GHG emissions generated at the fossil-fuel power plants used by Idaho Power to provide electricity to the regional grid, from which the hatchery will buy its power).

GHG emissions were estimated for each of these activities. The diesel fuel usage and GHG emissions of off-road construction equipment and on-road diesel-powered haul trucks were derived using the URBEMIS version 9.2.4 emission model, which predicts those values for northern California. For this analysis, it was assumed construction equipment and haul trucks in the Springfield area exhibit the same fuel economy as those same pieces of equipment in northern California. Detailed discussions of the assumptions and emission calculations are presented in Appendix D. Table 3.15-1 summarizes the initial construction emissions and long-term operational emissions. The initial construction emissions were amortized over a 10-year operating period to allow comparison with long-term operational emissions.

Table 3.15-1. Summary of GHG Emissions for Proposed Action

Emission Category	Total CO_2e (tons per year)
Construction Phase (2 years)	
Off-road construction equipment	389
Soil carbon loss (5 acres permanent vegetation loss)	221
Construction vehicles on public roads	355
Construction phase subtotal	965
Annual construction emissions amortized over 10-year operating period	97
Operational Phase	
Worker commute and facility deliveries	44
Egg and smolt hauling to receiving lakes	26
Electricity purchases	1,016
Operational phase subtotal	1,086
Total annual emissions (amortized construction emissions plus operational phase)	1,183
CEQ Evaluation Threshold	25,000

As shown in Table 3.15-1, the forecast long-term GHG emissions (including initial "soil carbon" emissions from ground disturbance, initial construction activity, long-term operational activity at Springfield hatchery, and indirect emissions from electricity purchases for operations) are only 1,183 tons per year of CO_2e. These emissions could be offset in part as the captive broodstock elements of the ongoing program are phased out. In addition, emissions could slightly change as resources dedicated to Sockeye rearing and outstocking activities at the Oxbow Fish Hatchery and Sawtooth Fish Hatchery were redirected. However, potential changes in emissions are difficult to estimate at this stage and it is likely the additional resources required to construct and operate the Springfield hatchery under the Proposed Action would result in greater emissions compared to the No Action Alternative. Regardless, the estimated emissions represent only a small fraction of CEQ's evaluation threshold (25,000 tons per year of CO_2e). Therefore, the potential impacts on GHG emissions and worldwide GHG concentrations are considered low even without the implementation of mitigation. Regardless, BPA acknowledges that emissions from the Proposed Action could contribute to cumulative worldwide GHG emissions. Therefore, the mitigation measures described in Section 3.15.3, Mitigation—Proposed Action, are proposed to reduce further GHG emissions caused by construction and operation of the Proposed Action.

Vulnerability and Adaptation: Potential Impacts of Future Climate Change on Future Operation of the Proposed Action

The consensus among the scientific community is that future worldwide climate change could alter existing meteorological patterns of local precipitation, local snowpack and snowmelt, local hydrology, and local groundwater recharge (Intergovernmental Panel on Climate Change 2007).

As a result, it is possible that worldwide climate change could affect the future seasonal patterns of groundwater flow from the artesian wells of the East Snake Plain aquifer, which would be used for water supply for the Proposed Action.

As described in Section 3.5, Water Quality and Water Quantity, water levels in the artesian wells of the East Snake Plain aquifer have been dropping gradually and are expected to drop considerably over the next 20 years as a result of several factors, including future changes in precipitation patterns. Under the Proposed Action, wellhead pumps would be installed to supplement the artesian floor and maintain the required water supply during peak months. As discussed in Section 3.5, Water Quality and Water Quantity, sufficient water supply exists to operate the Proposed Action, even in light of potential decreases in groundwater related to climate change.

Because the hatchery has feasible options to compensate for potential future decreases in water supply, the potential impacts caused by future climate change are considered low. Increased hatchery production provided for under the Proposed Action would help to offset potential declines in the natural population that may occur as a result of climate change.

3.15.3. Mitigation—Proposed Action

If the Proposed Action is implemented, IDFG will implement the following mitigation measures to minimize impacts on air quality and avoid or minimize impacts from GHG emissions.

- Transport all vegetation or other debris associated with construction clearing to an approved landfill. (Burning of all such material will not be done; some small-scale vegetation burning may be done for weed control on access roads).
- Use water trucks to control dust during construction, as needed.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.
- Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.
- Implement vehicle idling restrictions.
- Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.
- Locate staging areas in previously disturbed or graveled areas, where practicable, to minimize soil and vegetation disturbance.
- Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel that would not be necessary.
- Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.
- Reduce electricity use in the construction office by using compact fluorescent bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris where practicable.

3.15.4. Unavoidable Impacts Remaining After Mitigation—Proposed Action

There could be temporary increases in criteria pollutants during construction, and project-related trucks traveling on public roads would slightly increase regional emissions during operation of the proposed hatchery. Although these impacts could not be totally mitigated or avoided, they would not violate current air quality standards and would be considered low.

Unavoidable impacts would include slight increases in GHG emissions. Total direct and indirect GHG emissions are estimated to be up to 1,183 tons per year of CO_2e for direct fuel-related emissions and indirect emissions from regional electricity generation, which is used for operations and maintenance. This total is well below EPA's mandatory reporting threshold and much lower than CEQ's evaluation threshold. GHG emissions would be further reduced, as much as 15% to 20%, by the implementation of the mitigation measures described above (Reiser pers. comm.). Therefore, the impact on GHG concentrations from direct and indirect emissions is considered low.

3.15.5. Cumulative Impacts—Proposed Action

No new facilities are proposed near the proposed hatchery site. Traffic volumes along existing regional highways might increase as a result of regional population growth, but these population increases would be offset by EPA's nationwide requirements to reduce per-vehicle tailpipe emissions (U.S. Environmental Protection Agency 2011b). Therefore, air quality in rural Bingham County is expected to remain in attainment for criteria pollutants, and cumulative air quality impacts from the Proposed Action would be low.

All levels of GHG emissions play a role in contributing cumulatively to global GHG concentrations and climate change. However, given the low emissions caused from the Proposed Action, its contribution to global GHG concentrations is considered low.

3.15.6. Environmental Consequences—No Action Alternative

No improvements to existing facilities would be made under the No Action Alternative. Therefore, there would be no construction-related GHG emissions under this alternative. Some GHG emissions would continue on site as a result of ongoing maintenance of the existing facilities. These emissions would be low, accounting for less than 5% of the emissions projected from operation of the hatchery under the Proposed Action. Operational hatchery activities associated with the Snake River Sockeye Captive Broodstock Program would remain unchanged compared with existing conditions. Because increased sockeye production would not occur, it would be necessary to continue duplicating the captive broodstock components of the existing program and rearing and outstocking activities occurring at Oxbow and Sawtooth Fish Hatcheries would also continue. As indicated above, GHG emissions under the No Action Alternative are expected to be lower than the Proposed Action, and would therefore, also be low.

Chapter 4
Environmental Consultation, Review, and Permit Requirements

This chapter addresses statutes, implementing regulations, and executive orders applicable to the Proposed Action. This EA is being sent to tribes, federal agencies, state agencies, and state and local governments as part of the consultation process for the Proposed Action. Persons, tribes, and agencies consulted are included in the list in Chapter 5, Persons, Tribes, and Agencies Consulted, of this EA.

4.1. NATIONAL ENVIRONMENTAL POLICY ACT

This EA was prepared pursuant to regulations implementing NEPA (42 USC 4321 et seq.), which requires federal agencies to assess the impacts that their actions may have on the environment. NEPA requires preparation of an EIS for major federal actions significantly affecting the quality of the human environment. BPA prepared this Preliminary EA to determine if the Proposed Action would create any significant environmental impacts that would warrant preparing an EIS, or if a FONSI is justified.

4.2. FISH AND WILDLIFE

4.2.1. Endangered Species Act

The ESA (16 USC 1531 *et seq.*) establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the preservation of the ecosystems on which they depend. The ESA is administered by USFWS for terrestrial species and some freshwater fish species, and by NOAA Fisheries for anadromous fish and marine species.

Section 7(a) of the ESA requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. Section 7(c) of the ESA and other federal regulations require that federal agencies prepare a biological assessment (BA) addressing the potential effects of their actions on listed or proposed endangered species and critical habitats.

BPA consulted with the USFWS lists of fish, wildlife, and plant species in Bingham, Blaine, and Custer counties that are protected under the ESA (U.S. Fish and Wildlife Service 2011b) to determine which endangered or threatened species and critical habitat occur in the study area as defined in Sections 3.4, Vegetation, and 3.9, Fish and Wildlife, of this EA.

Based on the USFWS lists and reconnaissance-level surveys, BPA determined two species had the potential to occur and be affected by the Proposed Action: bull trout and bull trout critical habitat and Ute ladies'-tresses. BPA entered into pre-consultation with USFWS regarding potential effects on these species and critical habitat. Evaluation of the potential effects on ESA-listed species under the jurisdiction of NOAA Fisheries were addressed through separate

consultation on the Snake River Sockeye Captive Broodstock Program (National Oceanic and Atmospheric Administration Fisheries 2008) and will be further addressed through review and consultation on the Snake River Sockeye Draft Hatchery Genetic Management Plan (Idaho Department of Fish and Game and National Oceanic and Atmospheric Administration Fisheries 2010).

Pursuant to the requirements of Section 7(c) of the ESA, BPA prepared a BA and submitted it to USFWS. The BA addresses effects of the Proposed Action on bull trout and Ute ladies'-tresses. BPA determined the Proposed Action would not likely adversely affect either bull trout or Ute ladies'-tresses. BPA expects to submit the final BA to USFWS in November 2011, with a request to enter into formal consultation. BPA will request concurrence with the determination of effect. The potential effects on Ute's ladies'-tresses are discussed in greater detail in Section 3.4, Vegetation, of this EA. The potential effects on the Proposed Action on bull trout and critical habitat are discussed in greater detail in Section 3.9, Fish and Wildlife.

4.2.2. Fish and Wildlife Conservation

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 *et seq*.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. The Fish and Wildlife Coordination Act (16 USC 661 *et seq*.) requires federal agencies with projects affecting water resources to consult with USFWS and the state agency responsible for fish and wildlife resources. The analysis in Section 3.9, Fish and Wildlife, of this EA indicates that the alternatives would have low to moderate impacts on fish and wildlife, with implementation of appropriate mitigation. BPA is consulting with the USFWS regarding potential effects of the Proposed Action on fish and wildlife species and will implement the measures listed in this document and any other measures required by USFWS.

4.2.3. Essential Fish Habitat

Public Law 104–297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act. Under Section 305(b) (4) of the act, BPA is required to consult with NOAA Fisheries for actions that adversely affect EFH; in turn, NOAA Fisheries is required to provide EFH conservation and enhancement recommendations.

Within the study area defined in Section 3.9, Fish and Wildlife, EFH for Chinook salmon does occur. However, as discussed in Section 3.9, Fish and Wildlife, the Proposed Action would not result in any direct or indirect effects on EFH. Consultation for potential effects on ESA-listed fish are ongoing related to the existing Snake River Captive Broodstock Program and are covered under the 2008 FCFPS Biological Opinion.

4.2.4. Migratory Bird Treaty Act

The Migratory Bird Treaty Act, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 USC 703–712). Under the act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. The act classifies most species of birds as migratory, except for upland and non-native birds such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove. The Proposed Action would not

affect migratory birds through loss of habitat and would avoid potential effects on nesting birds by conducting ground disturbing activities outside of the nesting season. In the event that potential effects on nesting populations could not be avoided, BPA would work with USFWS to determine appropriate mitigation measures.

4.2.5. Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 directs federal agencies whose actions may negatively affect migratory bird populations to work with USFWS to develop an agreement to conserve migratory birds.

Construction, operation, and maintenance of the Proposed Action would result in no impacts on migratory birds, as a result of loss of habitat or direct mortality, as discussed in Section 3.9, Fish and Wildlife. The mitigation measures also described in this section would ensure potential impacts on nesting birds would be low.

4.2.6. Bald Eagle and Golden Eagle Protection Act

The Bald Eagle and Golden Eagle Protection Act (16 USC. 668–668d) addresses "take" of eagles, which includes both the disturbance of eagles or killing eagles. Bald and golden eagles do not occur in the proposed hatchery site. In addition, because the Proposed Action would not involve knowing take or other acts in wanton disregard of bald or golden eagles, implementation of the Proposed Action would not violate the provisions of the Bald Eagle and Golden Eagle Protection Act.

4.3. WETLANDS AND FLOODPLAINS

As part of the NEPA review, U.S. Department of Energy NEPA regulations 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.

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 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).

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.

4.4. STATE, AREA-WIDE, AND LOCAL PLAN CONSISTENCY

As indicated in Section 3.2, Land Use and Recreation, implementation of the Proposed Action would be consistent with applicable local land use planning and zoning in Bingham County. See Section 3.2, Land Use and Recreation, for further discussion.

4.5. CULTURAL AND HISTORICAL RESOURCES

Laws and regulations govern the management of cultural resources. A cultural resource is an object, structure, building, site, or district that provides irreplaceable evidence of natural or human history of national, state, or local significance, such as National Landmarks, archaeological sites, and properties listed (or eligible for listing) in the NRHP. Cultural resource-related laws and regulations include:

- Antiquities Act of 1906 (16 USC 431–433),
- Historic Sites Act of 1935 (16 USC 461–467),
- Section 106 of the NHPA (16 USC 470 et seq.), as amended,
- Archaeological Data Preservation Act of 1974 (16 USC 469 a–c),
- Archaeological Resources Protection Act of 1979 (16 USC 470 et seq.), as amended,
- Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.),
- Executive Order 13007 Indian Sacred Sites, and
- American Indian Religious Freedom Act of 1978 (PL 95-341, 92 Stat. 469, 42 USC 1996, 1996a.

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties. The NHPA provides a process, known as the Section 106 process that enables agencies to assess impacts on historic properties along with participation from interested and affected parties such as tribes, and then avoid, minimize, or mitigate for these impacts. Historic properties may be prehistoric or historic sites, including objects and structures that are included in or eligible for inclusion in the NRHP. Historic properties also include artifacts or remains within historic sites and properties of traditional and cultural importance to tribes.

To this end, BPA has provided information about the Proposed Action to and requested input on the level and type of proposed identification and evaluation efforts of the prehistoric resources from the Idaho State Historic Preservation Office (SHPO) and the following tribes:

- Nez Perce Tribe,
- Fort McDermitt Paiute-Shoshone Tribe,
- Shoshone Bannock Tribes of the Fort Hall Reservation, and
- Shoshone-Paiute Tribes of the Duck Valley Reservation.

4.6. NOISE AND PUBLIC HEALTH AND SAFETY

The Federal Noise Control Act of 1972 (42 USC 4901 *et seq.*) requires that federal actions, such as the Proposed Action, comply with state and local noise requirements. However, Idaho has not established state-wide regulations limiting noise emissions from commercial facilities. Similarly, Bingham County has not established a noise control ordinance that limits noise emissions. The county's zoning ordinance does require that facilities subject to Conditional Use Permits must be designed to prevent noise nuisance to nearby dwellings, and the Bingham County Comprehensive Plan specifies that new industrial development must be designed to control the negative aspects of noise. The analysis in Section 3.12, Noise and Public Health and Safety, of this EA indicates that the alternatives would have low to moderate noise impacts, with implementation of appropriate mitigation.

4.7. EXECUTIVE ORDER ON ENVIRONMENTAL JUSTICE

In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was released to federal agencies. This order states that federal agencies shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Proposed Action would not cause disproportionately high and adverse impacts on minority and low-income populations. Section 3.13, Socioeconomics and Environmental Justice, of this EA contains a discussion on environmental justice.

4.8. AIR QUALITY

The federal Clean Air Act, as amended (42 USC 7401 *et seq.*), requires the EPA and individual states to carry out a wide range of regulatory programs intended to assure attainment of the NAAQS. In Idaho, both the EPA and IDEQ have responsibility for air quality. Because the Proposed Action would occur in an area that is currently in attainment for meeting the NAAQS and because no stationary sources of air emissions would occur, construction activities associated with the Proposed Action are exempted for state regulation. Air quality impacts from hatchery construction and operation are expected to be low and mitigation measures are discussed in Section 3.15, Air Quality.

4.9. CLIMATE CHANGE

Gases that absorb infrared radiation and prevent heat loss to space are called GHGs. Models predict that atmospheric concentrations of all GHGs will increase over the next century, but the extent and rate of change is difficult to predict, especially on a global scale. As a response to concerns over the predicted increase of global GHG levels, various federal and state mandates address the need to reduce GHG emissions, including the following.

- The Clean Air Act is a federal law that establishes regulations to control emissions from large generation sources such as power plants; limited regulation of GHG emissions occurs through the New Source Review permitting program.
- The EPA has issued the *Final Mandatory Reporting of Greenhouse Gases Rule* that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to the EPA (U.S. Environmental Protection Agency 2010).
- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.

GHG emissions were calculated for Proposed Action activities that produce GHG emissions:

- during construction, "soil carbon" emissions produced through the removal and/or disturbance of natural vegetation and soils;
- during construction, through the use of gasoline and diesel powered vehicles, including cars, trucks, and construction equipment;
- during operation and maintenance, through the use of gasoline and diesel powered vehicles for employee commuting, supply deliveries, and transport of smolts to the receiving waters; and
- during operation, indirect GHG emissions generated at the fossil-fueled power plants used by Idaho Power to provide electricity to the regional grid, from which the proposed hatchery would buy its power.

GHG emissions would be below EPA's mandatory reporting threshold. The impact of the Proposed Action on GHG concentrations would be low, as discussed in Section 3.15, Air Quality, of this EA.

4.10. FARMLAND PROTECTION POLICY ACT

The Farmland Protection Policy Act (7 USC 4201 *et seq*.) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The purpose of this Act is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses. As discussed in Section 3.2, Land Use and Recreation, of this EA, the Proposed Action would not convert any area of agricultural land to non-agricultural uses.

4.11. HAZARDOUS MATERIALS

The application of several regulations that pertain to the management and use of hazardous materials to the Proposed Action are summarized below.

4.11.1. The Spill Prevention Control and Countermeasures Rule

The Spill Prevention Control and Countermeasures Rule includes requirements to prevent discharges of oil and oil-related materials from reaching navigable waters and adjoining shorelines (40 CFR Part 112). It applies to facilities with total above-ground oil storage capacity (not actual gallons on site) of greater than 1,320 gallons and facilities with below-ground storage capacity of 42,000 gallons. No onsite storage of oil or oil-related materials is proposed as part of the Proposed Action.

4.11.2. Comprehensive Environmental Response Compensation Liability Act, as Amended

The Comprehensive Environmental Response Compensation Liability Act, as amended, provides funding for hazardous materials training in emergency planning, preparedness, mitigation implementation, response, and recovery (42 USC 9601 *et seq.*). Eligible individuals include public officials, emergency service responders, medical personnel, and other tribal response and planning personnel. No hazardous materials sites are located within the Proposed Action.

4.11.3. Uniform Fire Code

The development of a Hazardous Materials Management Plan may also be required by local fire districts in accordance with the Uniform Fire Code. IDFG would develop and implement such a plan, if required.

4.11.4. Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act, as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of hazardous waste, and on owners and operators of treatment, storage, and disposal facilities (42 USC 6901 *et seq.*). Each facility owner or operator is required to have a permit issued by EPA or the state. Typical construction and maintenance activities have generated small amounts of these hazardous wastes: solvents, pesticides, paint products, motor and lubricating oils, and cleaners. Small amounts of hazardous wastes may be generated by the Proposed Action. These materials would be disposed of according to state law and the Resource Conservation and Recovery Act.

Chapter 5
Persons, Tribes, and Agencies Consulted

Those consulted include local, state, and federal agencies, public officials, tribes, landowners and trustees in the project vicinity, media, and others who expressed an interest in the Proposed Action. Specific individuals were contacted to gather information and data about the project area and applicable requirements, as part of consultation, or for permit applications.

5.1. FEDERAL AGENCIES

Environmental Protection Agency, Office of Water and Watersheds

National Oceanic and Atmospheric Administration, National Marine Fisheries Services

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service, Boise Office

5.2. STATE AGENCIES

Idaho Department of Fish and Game, Boise, Idaho Office

Idaho Department of Environmental Quality

State of Oregon House and Senate members for Districts encompassing the project area

5.3. TRIBES

Fort McDermitt Paiute-Shoshone Tribe

Idaho State Historic Preservation Office

Nez Perce Tribe

Shoshone Bannock Tribes of the Fort Hall Reservation

Shoshone-Paiute Tribes of the Duck Valley Reservation

5.4. LOCAL GOVERNMENTS

Bingham County Commissioner's Office

Idaho Association of Counties

5.5. NEWSPAPERS

Blackfoot – Blackfoot Morning News

Pocatello – Idaho State Journal

5.6. LANDOWNERS AND TRUSTEES IN THE PROJECT AREA

Barry Bradley

Houghland Farms, Inc.

Janette Powell

Ladd and Jane Carter

Michael J. Boran

Peter Thurston

Ronald and Paula Inskeep

Steven Glarborg

5.7. SOCKEYE RECOVERY PROGRAM TECHNICAL OVERSIGHT COMMITTEE

Andy Dittman
Andy Kohler
Barry Berejikian
Bob Griswold
Brent Snider
Brett Farman
Carlin McAuley, NMFS
Chris Kozfkay
Dan Baker
Dan Green
Debbie Frost
Derek Fryer
Des Maynard
Doug Engemann
Doug Taki
Duane Banks
Eric Stark
Ewann Berntson
Herron Thomas
Jeff Gislason
Jeff Heindel
Joe DeHerrera
Joe Krakker
Jonathan McCloud
Kurt Tardy
Lytle Denny
Mark Fritsch
Mark Strom
Matt Campbell
Matt Powell
Mike Edmondson
Mike Peterson
Mike Wastel
Paul Kline
Paul Krueger
Paul Moran
Paul Ocker
Penny Swanson
Ron Hardy
Timothy Hoffinagle
Tom Flagg
Tom Stuart
Travis Brown

Chapter 6
Glossary of Terms

Alluvial fan - The alluvial deposit of a stream where it issues from a gorge upon a plain or of a tributary stream at its junction with the main stream.

Ambient – Existing or present on all sides; encompassing.

Anadromous – Ascending rivers from the sea for breeding.

Aquifer - A wet underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be usefully extracted using a water well.

Artesian flow – The flow of water from a confined aquifer under positive pressure.

Artesian well - A well within a confined aquifer containing groundwater under positive pressure. This causes the water level in the well to rise to a point where hydrostatic equilibrium has been reached. Water may even reach the ground surface if the natural pressure is high enough, in which case the well is called a flowing artesian well.

A-weighted decibels - An expression of the relative loudness of sounds as perceived by the human ear.

Beneficial use - The uses of water necessary for the survival of or well being of man, plants and wildlife. Examples of BU include the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

Bequest value - Value on ensuring the availability of biodiversity and ecosystem functioning to future generations.

Broodstock - A group of mature individuals used in aquaculture for breeding purpose.

Conforming use – Land that is employed in compliance with zoning ordinances in a particular area.

Consumer surplus - The difference between the maximum price a consumer is willing to pay for something and the actual price paid.

Critical habitat - A specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and protection.

Cumulative impacts - Impacts on the environment, which result from the incremental impact of an action when added to other past, present, and future actions.

Delisting – The act of removing a species' designation from the Endangered Species Act.

Distinct Population Segment – The smallest division of a taxonomic species permitted to be protected under the Endangered Species Act.

Emergent wetland – A wetland that is usually dominated by perennial plants is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens.

Endemic – Being unique to a defined geographic location or habitat.

Environmental justice populations – Minority and low-income populations as identified by Executive Order 12898, which requires federal agencies to analyze the effects of their actions on segments of the population that may disproportionately adversely affected.

Escapement – The portion of an anadromous fish population that escapes commercial and recreational fisheries to reach its native spawning grounds.

Essential fish habitat - Bodies of water and substrate required for fish spawning, breeding, feeding, and a place where fish can grow to maturity.

Eutrophication – Increased rate of supply of nutrients to an ecosystem.

Evolutionary significant unit (ESU) –A Pacific salmon population that is reproductively isolated from other populations and that represents a significant component of the evolutionary legacy of the species.

Fluveolian - Of, relating to, or inhabiting a river or stream; produced by the action of a river or stream.

Forested wetland - Swampy, streamside forests, bottomlands, or wet woods.

Formalin - A generic term that describes a solution of 37% formaldehyde gas dissolved in water.

Full-term smolt - A young salmon that has completed the process of first migrating from fresh water to salt water.

Greenhouse gas - A gas in an atmosphere that absorbs and emits radiation, e.g., carbon dioxide.

Headbox - A device for controlling the flow of a suspension of solids into a machine.

Heterozygosity – The state of having different alleles at one or more corresponding chromosomal loci.

Historic property – A property that is eligible for listing or that is listed on the National Register of Historic Places based on specific criteria for which potential effects of an agency action must be evaluated pursuant to the National Historic Preservation Act.

Hydraulic head – A specific measure of water pressure above a specified reference point, typically measured as a water elevation level.

Hydrograph - A graph showing changes in the discharge of a river over a period of time.

Iodophor - A complex of iodine and a surface-active agent that releases iodine gradually and serves as a disinfectant.

Isolation baffles - A sound-proof enclosure or apparatus that prevents sound leakage into the outside environment.

Juvenile – A not yet fully mature animal or plant.

Low head - A low-head hydro project generally describes an installation with a fall of water less than 16 feet.

Mitigation – The act of making something less severe or harsh.

Non-native - Typically refers to a species living outside its native distributional range, which has arrived there by human activity.

Noxious weed – An invasive species of a plant that has been designated by agricultural authorities as one that is injurious to agricultural/horticultural crops, natural habitats, humans, or livestock.

Open water – Areas that are typically perennially wet with deeper water levels and often submerged vegetation.

Outplant – A site or field facility located away from the main site.

Piscivorous – Feeding on fishes.

Pool elevation – Water surface elevation above sea level.

Quaternary surficial – Of or relating to the last 2 million years of the Earth's surface.

Right of first refusal –A promise by an owner that if the owner decides to sell, the owner will give the holder of the right the chance to match the best price and terms the owner receives.

Ruderal – Growing where the natural vegetational cover has been disturbed by humans.

Secondary contact recreation – Waters that are suitable for partial body contact recreation, with minimal threat to public health due to water quality. An example of this would be fishing or boating.

Section 303(d) of the Clean Water Act – Under this section of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired water bodies that do not meet water quality standards even after installation of the minimum required levels of pollution control technology. This law requires these jurisdictions establish priority rankings for waters on the lists and develop total maximum daily load allocations for these waters.

Seismic fault – Fractures in the Earth’s crust prone to earthquakes.

Sheet erosion - A very slow form of erosion where “sheet wash”—a thin film of water——transports soil particles by rolling them along the ground.

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

Step down – Step down well test, the well is pumped at successively greater rates over short periods of time. During each step down the pumping level is held constant during any one step, but is increased during each successive step.

Stream channel – A long, narrow, sloping depression where a natural stream flows or may flow.

Swim-up fry – Recently hatched fish that have absorbed their yolk sac, are ready to start feeding, and rise to the surface to gulp air into the swim bladder.

Total dynamic head – The total height that a fluid is to be pumped.

Transmissivity – The rate at which groundwater flows horizontally.

Vegetation community – A grouping of similar plant life in a particular region.

Water residence time – The average time a water molecule will spend in a water body.

Chapter 7
References

7.1. WRITTEN REFERENCES

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7.2. PERSONAL COMMUNICATIONS

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APPENDIX A

2008 Columbia Basin Fish Accords Memorandum of Agreement between the State of Idaho and FCRPS Action Agencies

2008 Columbia Basin Fish Accords
Memorandum of Agreement between the State of Idaho and FCRPS Action Agencies

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MEMORANDUM OF AGREEMENT BETWEEN THE STATE OF IDAHO, THE BONNEVILLE POWER ADMINISTRATION, THE U.S. ARMY CORPS OF ENGINEERS, AND THE U.S. BUREAU OF RECLAMATION

I. INTRODUCTION

The Bonneville Power Administration ("BPA"), the U.S. Army Corps of Engineers ("Corps") and the U.S. Bureau of Reclamation ("Reclamation") (collectively, "Action Agencies") and the State of Idaho ("Idaho" or "State") have developed this Memorandum of Agreement ("Agreement" or "MOA") through good faith negotiations to address for the term of the Agreement issues associated with the direct and indirect effects of construction, inundation, operation and maintenance of the Federal Columbia River Power System ("FRCPS")[1] and Reclamation's Upper Snake River ("Upper Snake") Projects,[2] on the fish and wildlife resources of the Columbia River Basin. The Action Agencies and Idaho intend to provide for a long-term agreement that provides benefits to all the Parties. Specific reasons for this Agreement include the following:

- To address legal mandates for the FCRPS and Upper Snake Projects under the Endangered Species Act ("ESA"), the Northwest Power Act ("NPA"), and the Clean Water Act ("CWA").
- To address the Parties' mutual concerns for certainty and stability in the funding and implementation of projects for the benefit of fish and wildlife affected by the FCRPS and Upper Snake Projects, affirming and adding to the actions proposed in the draft FCRPS and Upper Snake Biological Opinions ("BiOps"); and
- To foster a cooperative and partnership-like relationship in implementation of the mutual commitments in this Agreement

II. HYDRO COMMITMENTS

A. Hydro Performance

A.1. Performance Standards, Targets, and Metrics:

Idaho concurs in use of the hydro performance standards, targets, and metrics as described in the Main Report, Section 2.1.2.2 of the Action Agencies' August 2007

[1] For purposes of this Agreement, the FCRPS comprises 14 Federal multipurpose hydropower projects. The 12 projects operated and maintained by the Corps are: Bonneville, the Dalles, John Day, McNary, Chief Joseph, Albeni Falls, Libby, Ice Harbor, Lower Monumental, Little Goose, Lower Granite, and Dworshak dams. Reclamation operates and maintains the following FCRPS projects: Hungry Horse Project and Columbia Basin Project, which includes Grand Coulee Dam.

[2] For purposes of this Agreement, the Upper Snake River Projects (Upper Snake) are Minidoka, Palisades, Michaud Flats, Ririe, Little Wood River, Boise, Lucky Peak, Mann Creek, Owyhee, Vale, Burnt River and Baker.

FCRPS Biological Assessment (FCRPS BA)(pages 2-3 through 2-6) and the draft FCRPS BiOp at RPA 51 (pages 63-64 of 85). Idaho and its representatives may recommend to the Action Agencies actions that may exceed performance standards, which will be considered and may be implemented at the discretion of the Action Agencies.

A.2 Performance and Adaptive Management:

The Parties agree that the BiOps will employ an adaptive management approach, including reporting and diagnosis, as described in Section 2.1 of the Action Agencies' FCRPS BA. The Parties agree that if biological or project performance expectations as described in the FCRPS BA are not being met over time as anticipated, diagnosis will be done to identify causes, and remedies will be developed to meet the established performance standard. The performance standard for species or the federal projects will not be lowered during the terms of the BiOps (although as provided in the FCRPS BA, tradeoffs among Snake River and lower Columbia River federal dams are allowed). The Parties recognize that new biological information will be available during the term of this Agreement that will inform the methods and assumptions used to analyze the effects of hydro operations on fish species covered by this Agreement. The Parties will work together to seek agreement on methods and assumptions for such analyses building on analyses performed in development of the FCRPS BiOp as warranted.

As described in the draft FCRPS BiOp, a comprehensive review will be completed in June 2012 and June 2015 that includes a review of the state of implementation of all actions planned or anticipated in the FCRPS and Upper Snake BiOps and a review of the status and performance of each ESU addressed by those BiOps. The Parties agree that they will jointly discuss the development, analyses and recommendations related to these comprehensive evaluations and, in the event performance is not on track, to discuss options for corrective action.

A.3. Research, Monitoring, and Evaluation.

Maintaining and improving research, monitoring, and evaluation programs is critical to informed decision making on population status assessments and improving management action effectiveness. The Parties agree that the program of research, monitoring, and evaluation provided in the draft FCRPS and Upper Snake BiOps and this Agreement provide a comprehensive RM&E program that addresses critical uncertainties. The Action Agencies will implement status and effectiveness research, monitoring and evaluation sufficient to robustly track survival improvements and facilitate rebuilding actions accomplished, in part, through projects and programs identified in the FCRPS BA and the draft BiOp. The Parties further agree that the Action Agency effort should be coordinated with implementation partners including other fishery managers.

B. Spill/Transport

The Parties agree that the spill and fish transportation measures proposed in the draft BiOps, subject to adaptive management as provided in the FCRPS BA, satisfy ESA and

NPA requirements with respect to salmon and steelhead affected by the FCRPS and Upper Snake Projects.

C. Dam Breaching

Idaho supports the adequacy of the combined package of the BiOps and this Agreement, and therefore agrees that breaching some or all of the Snake River FCRPS dams is not necessary to satisfy the ESA, NPA or CWA.

D. Flow Actions

The Parties agree to the flow and water management actions in the draft FCRPS and Upper Snake BiOps and further recognize the need for such actions to be consistent with the Snake River Water Rights Act of 2004, Pub. L. No. 108-447, Div. J, Tit. X, 118 Stat. 2809, 3431. In particular, concerning the relationship between the FCRPS BiOp and the Council's Fish and Wildlife Program and Mainstem Amendments with respect to Hungry Horse and Libby Dams, the Parties support implementing the Water Management strategies for *Summer reservoir operations at Hungry Horse and Libby, Grand Coulee and Dworshak Dams* contained in the Council's Mainstem Amendments to the Columbia River Basin Fish and Wildlife Program as to such Montana facilities.

E. Emergency Operations for Unlisted Fish

The Action Agencies agree to take reasonable actions to aid non-listed fish during brief periods of time due to unexpected equipment failures or other conditions and when significant detrimental biological effects are demonstrated. Where there is a conflict in such operations, operations for ESA-listed fish will take priority.

III. HABITAT AND HATCHERY COMMITMENTS

A. BPA Funding for Habitat

A.1 General Principles:

- Habitat projects funded under this Agreement are linked to biological benefits based on limiting factors for ESA-listed fish. See Attachment B.
- Projects funded under this Agreement are consistent with recovery plans and subbasin plans now included in the Council's Program. More specific linkages will be documented as a function of the BPA contracting process.
- Projects may be modified by mutual agreement over time based on biological priorities, feasibility, science review comments, or accountability for results.

A.2 Types of Projects

BPA is committing to funding a suite of projects and activities that are summarized in Attachment A. The projects or actions are all designed to address ESA-listed salmon and

steelhead, in support of the draft FCRPS BiOp and Council program implementation in Idaho.

B. Funding for Hatchery Actions

B.1. General Principles:

- BPA's funding will be in addition to and not replace funding for hatcheries provided by other entities, including but not limited to funding provided by Congress pursuant to the Mitchell Act,
- If the hatchery action identified in Attachment A is not able to be implemented as originally proposed but the need for the hatchery to meet FCRPS BiOp commitments remain, BPA and Idaho will seek a replacement in accordance with the principles in Section III.E below. Otherwise, if the hatchery action identified in Attachment A is not able to be implemented, the Action Agencies are not obligated to fund a replacement or alternative project. Unused hatchery funds may be shifted to non-hatchery projects only upon the Parties' mutual agreement.

B.2. Expense and Capital Hatchery Actions:

BPA will make available funding for a sockeye conservation hatchery (new facility construction and/or expansions of existing facilities), as described in Attachment A. Most of this funding is anticipated to qualify as capital funding. The remaining amount is anticipated to be expense funding to provide for planning expenses or other non-capital activities associated with hatchery design, construction, and implementation. Starting with the FY 2010 rate period, BPA will collaborate with Idaho to develop a capital spending plan in advance of each new rate period that arises during the Agreement, so as to ensure that adequate rate period capital budgets are available for funding the capital actions in this Agreement.

C. General Provisions For All Projects

C.1. All projects funded pursuant to this Agreement shall:

- Be consistent with the Council's Program (including sub-basin plans), as amended, otherwise compliant with the NPA's science and other review processes; applicable ESA recovery plans; and applicable data management protocols adopted by the Action Agencies.
- For BPA funded commitments, be consistent with BPA's then applicable policies, including but not limited to BPA's *in lieu* policy and BPA's capital policy.
- For BPA funded commitments, report results annually (including ongoing agreed upon monitoring and evaluation) via PISCES and/or other appropriate databases.
- Remain in substantive compliance with any applicable project contract terms.

C.2. In addition, for non-hatchery projects identified as providing benefits to listed ESA fish, Idaho shall:

- provide estimated habitat quality improvement and survival benefits from the project to a population or populations of listed salmon and steelhead based on key limiting factors;
- identify these benefits based on expert determination; and
- support and defend these estimates of habitat improvement and survival benefits with scientific, policy, and legal arguments.

C.3. In addition, for hatchery projects, Idaho shall, prior to capital funding:

- Identify the biological benefits associated with a hatchery project based on expert determination and will support and defend these estimates of biological benefits;
- Obtain a NOAA determination that the hatchery project will not impede and where possible will contribute to recovery.
- Secure or assist in securing all necessary permits for hatchery construction and operation.

C.4. The Parties will coordinate their RM&E projects with each other and with regional RM&E processes (particularly those needed to ensure consistency with the FCRPS BiOp RM&E framework), as appropriate and agreed to among the Parties.

C.5. For actions on federal lands, Idaho will consult with the federal land managers and obtain necessary permits and approvals.

D. Council and ISRP Review

D.1. As described in Section III.C.1, above, all projects funded by BPA pursuant to this Agreement must be consistent with the Council's Program and follow the NPA's science and other review processes. The Parties agree that, subject to Section III.C.1, BPA funding commitments in this Agreement and the associated projects to be implemented by Idaho are consistent with the Council's Program.

D.2. The Parties recognize that the Council's Program is a maturing program, which through several decades of implementation has established a continuing framework for mitigating the impacts of hydroelectric development in the Columbia River Basin. The Parties acknowledge that nothing in this Agreement precludes any Party from making recommendations to the Council about modifications to the Council or ISRP review processes to facilitate project implementation under this Agreement or generally.

D.3. The Parties further acknowledge Idaho's desire to not include ongoing projects in this Agreement, with the exception of those ongoing projects contained in Attachment A that are being expanded "Ongoing projects" means projects proposed by Idaho, recommended by the Council, and funded by BPA during the FY 07-09 period pursuant

to BPA's FY 07-09 programmatic fish and wildlife decisions.[3] The Action Agencies agree that this Agreement does not preclude Idaho from seeking funds to continue such ongoing projects or for new projects through the Council's Program and that all requests for such funds will be considered by BPA in accordance with the NPA. Requests for such funds shall be not be predicated, or otherwise justified, in whole or part on grounds inconsistent with the forbearance and adequacy commitments in Section IV.A and B. As a result, the Parties acknowledge that Idaho may continue to seek funding for ongoing or new projects from BPA pursuant to the NPA for habitat, hatchery, and research, monitoring and evaluation (RM&E) activities to protect, mitigate, and enhance resident fish and terrestrial life inside and outside the anadromous zone in Idaho. The Parties recognize that any questions over the applicability of this Agreement to projects concerned with resident fish in the anadromous zone, to the extent that a project may affect anadromous fish, will be resolved in accordance with Section IV.F. Idaho also may continue to seek funding for ongoing or new projects from BPA in addition to funding provided pursuant to this Agreement for habitat, hatchery, or RM&E activities to protect, mitigate, and enhance anadromous fish in the anadromous zone, and BPA shall comply with applicable NPA requirements in determining whether to fund such requests; provided that, as provided in the forbearance and adequacy provisions in Section IV.A and B, any such funding determinations shall not be subject to judicial or other challenge.

E. Replacement Projects and Adaptive Management

E.1. General Principles:

- This section does not apply to hatchery projects unless, as described above, the original proposed hatchery action is not able to be implemented but the need for hatchery to meet FCRPS BiOp commitments remains.
- The Parties agree that a project identified in this Agreement may not ultimately be implemented or completed due to a variety of possible factors, including but not limited to:
    - Problems arising during regulatory compliance (e.g., ESA consultation, NEPA, NHPA review, CWA permit compliance, etc);
    - The project does not meet BPA's in lieu policy or does not meet BPA's capital policy;
    - New information regarding the biological benefits of the project (e.g., new information indicating a different implementation action is of higher priority, or monitoring or evaluation indicates the project is not producing its anticipated benefits);
    - Changed circumstances (e.g., completion of the original project or inability to implement the project due to environmental conditions); or
    - Substantive non-compliance with the implementing contract.

[3] The ongoing projects are: BPA Project Nos. 198806500, 198909800, 199005500, 199107200, 199107300, 199202603, 199206100 , 199206103, 199303501, 199401500, 199404700, 199505700, 199505701, 199608600, 199700100, 199800200, 200002800, 200700300, 200717000, 200733200, 200739400, 200739900, 200740200, 200740300, and 200799000.

- Should a project not be implemented due to one or more of the above factors, the Action Agency and Idaho will promptly negotiate a replacement project.

E.2. Replacement Projects:

- A replacement project should be the same or similar to the one it replaces in terms of target species, limiting factor, mitigation approach, geographic area and/or subbasin and biological benefits.
- A replacement project will not require additional Council or ISRP review if the original project has been reviewed.
- A replacement project should have the same or similar planning budget as the one it replaces (less any expenditures made for the original project). Such budget must address carry-forward funding whose amount and calculation will be subject to the Parties' mutual agreement.

E.3. Adaptive Management

In addition to project-specific adaptation described above, the Parties may mutually agree to adaptively manage this shared implementation portfolio on a more programmatic scale based on new information or changed circumstances.

F. Inflation, Ramp Up, Planning v. Actuals, Carry-over:

F.1. Inflation.

Beginning in fiscal year (FY) 2010, BPA will provide an annual inflation adjustment of 2.5 percent.

F.2. Treatment of Ramp-up of new/expanded work:

In recognition of the need to "ramp up" work (timing of Agreement execution, contracting, permitting, etc), the Parties agree that average BPA spending for the new/expanded projects in fiscal year 2008 is expected to be approximately one-third of the average planning level shown for the project in Attachment A; and for fiscal year 2009, it is expected to be up to 75 percent of the average planning level shown for the project in Attachment A, with full planning levels expected for the projects in Attachment A starting in fiscal year 2010.

F.3. Assumptions regarding Planning versus Actuals

Historically, the long-term average difference between BPA's planned expenditures for implementing the expense component of the Power Council's Fish and Wildlife Program, and actual spending (what BPA is invoiced and pays under the individual contracts), has been about seven percent, with the actual spending averaging 93 percent of planned spending. While BPA will plan for spending up to 100 percent of the funding commitments described in this Agreement, nevertheless, due to a variety of factors,

BPA's actual expenditures may be less. As a result, the Parties agree that provided BPA's actual spending for the totality of project commitments in this Agreement averages 93 percent of the planning amount annually, BPA is in compliance with its funding commitments. If BPA is not meeting the 93 percent average annually due to circumstances beyond the Parties' control, BPA will not be in violation of this Agreement, but the Parties will meet to discuss possible actions to remove the impediments to achieving 93 percent. The Parties also agree that, for the reasons given above regarding ramp up, new projects and projects expansions during their FY08 and FY09 ramp up phase will be excluded from this calculation.

F.4. Unspent funds, and pre-scheduling/rescheduling.

Annual project budgets may fluctuate plus or minus 20 percent in relation to the planning budgets for each project, to allow for shifts in work between years (within the scope of the project overall), if work will take longer to perform for reasons beyond the sponsors' control (reschedule), or can potentially be moved to an earlier time (preschedule). Fluctuations within an overall project's scope of work, but outside of the 20 percent band, can also occur if mutually agreeable for reasons such as, but not limited to, floods, fires, or other *force majeure* events.

Generally speaking, unspent project funds that are carried over per the reschedule/preschedule provisions above (i.e., within +/- 20 percent of the annual project budget and within the project's scope of work) may be carried forward from one contract year (i.e., Year 1), to as far as two contract years (i.e., Year 3) into the future before such funds are no longer available. There are two exceptions to this reschedule/preschedule criteria and the limitation on carry-forward.

First, as an additional limitation on carry-forward, for project expansions and new projects (which describes all the projects in Attachment A), if actual total FY08 and FY09 spending is less than the sum of 33 percent of the FY08 budget and up to 75 percent of the FY09 budgets reflected in Attachment A for the project due to circumstances within Idaho's control, then the difference between what is actually spent in FY08 and FY09, and the sum of 33 percent of the FY08 budget and up to 75 percent of the FY09 budgets reflected in the spreadsheet, cannot be carried over into FY10.

Second, to the extent that the projects proposed for funding in this Agreement involve the acquisition of interests in land or water from willing sellers, BPA and Idaho may, by mutual agreement, adjust the 20 percent fluctuation band for the budgets for such projects to accommodate the uncertainties of negotiations with sellers. In addition, BPA may extend the two year carry-forward limit for such projects, provided that Idaho provides at least six months notice of the potential need for such an extension, and provided further that BPA may decline to extend the carry-forward limit to avoid a "bow wave" of spending in any given year, or towards the end of this Agreement's term, or on any other reasonable ground.

IV. FORBEARANCE, WITHDRAWAL, AND DISPUTE RESOLUTION

A. Effects on Litigation

A.1. The Parties will discuss the appropriate means of alerting the district court in *NWF v. NMFS* of this Agreement (if needed) and will undertake any agreed-upon approach within14 calendar days of the effective date of this Agreement.

A.2. Idaho covenants that during the term of this Agreement:

a. Idaho will not initiate, intervene in, or support in any manner ESA, NPA, CWA, or Administrative Procedure Act ("APA") suits against the Action Agencies or NOAA regarding the legal sufficiency of the FCRPS proposed action, FCRPS BiOp, Upper Snake BiOp and/or conforming implementing Records of Decision (RODs) absent consent of all federal defendants.

b. Idaho will not initiate, intervene in, or support in any manner ESA, NPA, CWA or APA suits against the Action Agencies or NOAA regarding the effects on fish resources or water quality resulting from the operations or existence of the FCRPS and Upper Snake Projects that are specifically addressed in the FCRPS PA, FCRPS BiOp, Upper Snake BiOp and/or conforming implementing RODs absent consent of all federal defendants. Water quality for purposes of this provision includes only water temperature and total dissolved gas requirements and therefore excludes all other matters, such as (by way of illustration and not limitation) the Corps' program under 33 U.S.C. § 1344 and toxics clean up regulation. Nothing in this Agreement, including without limitation Section II.D regarding flow and water management, shall preclude Idaho from enforcing, to the extent permitted by federal law, the provisions of state water quality statutes, currently the Idaho Environmental Protection and Health Act (Idaho Code §§ 39-101 to -175C) and the Idaho Water Quality Act (Idaho Code §§ 39-3601 to -3639), or rules promulgated under such statutes, with respect to any effect from the operation the FCRPS and Upper Snake Projects, except effects on total dissolved gas or water temperature when an FCRPS Project is operated consistently with the draft FCRPS BiOp.

c. Idaho's participation in ongoing and future BPA rate proceedings (ratemaking, approval, or review) will be consistent with the terms of this Agreement.

d. Idaho shall not advocate against, either directly or through parties not subject to the Agreement, the adequacy of the FCRPS and Upper Snake BiOps and the Action Agencies' implementation of the BiOps and this Agreement. The term "advocate" does not include (1) reporting data or results from projects or activities that have been undertaken pursuant to, or are otherwise consistent with, this Agreement; or (2) producing or testifying concerning such data or results when compelled by law to do so—e.g., by virtue of judicial process or compliance with state public record statutes.

e. These commitments apply to state agencies, boards, commissions or other Executive Branch entities, and any person that acts as an agent or representative of same. Subject to Section IV.C.3, the Parties agree that Idaho's appointees to the Council are excluded from the obligations under this Agreement to the extent that such exclusion is necessary to enable Idaho's appointees to perform their responsibilities under the NPA.

B. Affirmation of Adequacy

B.1. This Agreement builds upon and expands the commitments of the Action Agencies called for in the FCRPS and Upper Snake BiOps. The Parties support this package of federal and Agreement actions as an adequate combined response of these entities to address the government's duties to mitigate for the FCRPS effects under applicable environmental laws and regulations for the ten year duration of the BiOps. This includes requirements for:

- conserving listed salmon and steelhead, including avoiding jeopardy and adverse modification of critical habitat under the ESA;
- protection, mitigation, enhancement and equitable treatment of fish and wildlife under the NPA; and
- CWA provisions related to water temperature and total dissolved gas requirements for FCRPS dams to the extent compliant with the draft FCRPS BiOp and subject to the enforcement authority retained in Section IV.A.2.b.

B.2. Idaho further agrees that the Action Agencies' commitments under this Agreement and the BiOps as to hatchery projects are adequate for 30 years from the effective date of this Agreement, except that after year 15 of the 30 year forbearance for hatcheries, there is a change in the status of an evolutionarily significant unit (e.g., a new listing) or if after year 15 there is new information or changed circumstances that indicate additional hatchery actions are needed to assist in mitigating impacts of the FCRPS consistent with current science and applicable law, Idaho is not precluded from seeking additional funding from the Action Agencies for hatcheries. This commitment continues beyond termination of this Agreement's other provisions on September 30, 2018.

B.3. Idaho's determination of adequacy under applicable law is premised on several important assumptions and understandings with which the federal parties to this Agreement concur:

- The specific actions identified in this Agreement are carried out and/or funding for such actions is provided by the federal parties in a timely manner;
- Other actions not specifically identified in this Agreement, but committed to in the FCRPS BiOp are carried out in a timely manner;
- The biological performance and status of the species affected by the development and operation of the FCRPS and Upper Snake hydroprojects are diligently and comprehensively monitored and analyzed, and reported to Idaho and others as provided the BiOps; and

- Adaptive management will be used as described in the section 2.1 of the Action Agencies' FCRPS BA to ensure achievement of performance objectives for the FCRPS.

C. Council Program Amendment Process and Other Provisions

C.1. During the term of the Agreement, the Parties will submit comments or recommendations for Council Program amendments that are consistent with and are intended to effectuate this Agreement.

C.2. If third parties recommend an amendment to the Program that any Party believes is contrary to this Agreement, the Party is not precluded by the terms of this Agreement from asserting any arguments it may have as to whether such an amendment is lawful or unlawful under the NPA, or any other law, provided in so doing they act consistent with the terms of this Agreement.

C.3. Idaho's Council representatives participated in the development of this Agreement. Nothing in the Agreement, however, is intended to affect, or shall be construed as affecting, consideration by such representatives of recommendations from parties other than Idaho when discharging their duties under the NPA. Similarly, nothing in this Agreement is intended to affect, or shall be construed as affecting, the Action Agencies' rights under Section IV.E with respect to withdrawal or Section IV.F with respect to dispute resolution in the event that the Council takes action inconsistent with Idaho's commitments under this Agreement.

D. Good Faith Implementation and Support

Best effort good-faith implementation and support of this Agreement is the general duty to which all Parties agree to be bound. Nonetheless, the Parties understand that from time to time questions or concerns may arise regarding a Party's compliance with the terms of this Agreement. In furtherance of the continuing duty of good faith, each Party agrees that the following specific actions or efforts will be carried out:

D.1. On a continuing basis, it will take steps to ensure that all levels of their government/institution is made aware of the existence of this Agreement and the specific commitments and obligations herein, and emphasize the importance of meeting them;

D.2. Each Party will designate a person to be initially and chiefly responsible for coordinating internal questions regarding compliance with the Agreement;

D.3. Each Party will make best efforts to consult with other Parties prior to taking any action that could reasonably be interpreted as inconsistent with any part of this Agreement. To assist in this, the Parties will designate initial contact points. The formality and nature of the consultation will likely vary depending circumstances. The initial contact points are initially charged with attempting to agree on what form of consultation is required. In some instances, the contact between initial contact points

may suffice for the consultation, while in others, they may need to recommend additional steps. The Parties agree that consultations should be as informal and with the least amount of process necessary to ensure that the Parties are fulfilling the good-faith obligation to implement and support the Agreement.

D.4. If a Party believes that another Party has taken action that contrary to the terms of the Agreement, or may take such action, it has the option of a raising a point of concern with other Parties asking for a consultation to clarify or redress the matter. The Parties will endeavor to agree upon any actions that may be required to redress the point of concern. If after raising a point of concern and having a consultation the Parties are unable to agree that the matter has been satisfactorily resolved, any Party may take remedial actions as it deems appropriate, so long as those remedial actions do not violate the terms of the Agreement.

E. Changed Circumstances, Renegotiation/Modification, Withdrawal

E.1. The Parties assume that NOAA will issue final BiOps for the FCRPS and Upper Snake whose provisions, including any reasonable and prudent alternative, will be consistent with the draft BiOps insofar as material to this Agreement. If a Party believes that a material difference exists between the draft and final BiOps for either the FCRPS or Upper Snake, the provisions of Section E.3 apply.

E.2 If any court, regardless of appeal, finds that the BiOp or agency action is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law, and subsequently remands the BiOp to NOAA Fisheries this Agreement shall remain in force. If any court, regardless of appeal finds that the BiOp or agency action is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law, the Parties will seek to preserve this Agreement, and will meet promptly to determine the appropriate response as described below:

(a) In the event that a portion(s) of this Agreement is in direct conflict with the court order or resulting amended BiOp, the Parties shall meet and agree on an appropriate amendment to that section, or, if such amendment is not possible under the terms of the court order or resulting amended BiOp, then a substitute provision shall be negotiated by the Parties.

(b) If the court-ordered FCRPS operations or resulting amended BiOp require additional actions that are either financially material to an Action Agency or that materially constrain the Corps or Reclamation from meeting FCRPS purposes, Section IV.E.5 shall apply.

(c) The Parties will participate in any court-ordered process or remand consultation in concert with Sections IV.D and IV.E.

(d) The Parties intend that determinations of materiality will only be made in cases of great consequence.

E.3. In the event of the occurrence of any of the material effects in Section E.2, or in the event of material non-compliance with the Agreement not resolved by dispute resolution,

the affected Party or Parties shall notify the other Parties immediately and identify why the event is considered material. The Parties shall utilize dispute resolution if there is a disagreement as to whether the event is material. In addition, prior to any withdrawal, the Parties shall first make a good faith effort to renegotiate mutually agreeable modifications to the Agreement. If renegotiation is not successful, the affected Party may notify the other Parties in writing of its intent to withdraw by a date certain. If renegotiation is not successful, at the time the withdrawal is effective, all funding commitments and/or other covenants made by the withdrawing Party cease, and the withdrawing Party shall have no further rights or obligations pursuant to the Agreement. A withdrawing Party reserves any existing legal rights under applicable statutes, including all arguments and defenses, and this Agreement cannot be used as an admission or evidence in support of or against any such argument or defense.

E.4. The provisions of this Agreement authorizing renegotiation, dispute resolution and withdrawal provide the sole remedies available to the Parties for remedying changed circumstances or disputes arising out of or relating to implementation of this Agreement.

E.5. Any Party may request renegotiation or withdraw for reasons other than those enumerated above subject, however, to the provisions in Section IV.E.3.

E.6. If one Party withdraws from the Agreement, any other Party has the option to withdraw as well, with prior notice.

E.7. Savings. Notwithstanding Section IV.E.3, in the event of withdrawal, BPA will continue providing funding for projects necessary for support of BiOp commitments (as determined by the Action Agencies), and may provide funding for other on-going projects or programs that the Parties mutually agree are important to continue.

F. Dispute Resolution

F.1. Negotiation

1.a. The Parties shall attempt in good faith to resolve any dispute arising out of or relating to implementation of this Agreement in accordance with this section and without resort to administrative, judicial or other formal dispute resolution procedures. The purpose of this Section IV.F.1 is to provide the Parties an opportunity to fully and candidly discuss and resolve disputes without the expense, risk and delay of a formal dispute resolution.

1.b. If the Parties are unable to resolve the dispute through informal dispute resolution, then the dispute shall be elevated to negotiating between executives and/or officials who have authority to settle the controversy and who are at a higher level of management than the person with direct responsibility for administration of this Agreement. All reasonable requests for information made by one Party to the other will be honored, with the Action Agencies treating “reasonable” within the context of what would be released under the Freedom of Information Act.

1.c. In the event a dispute over material non-compliance with the Agreement has not been resolved by negotiation, the affected Party may seek to withdraw, without further renegotiation, in accordance with Section IV.E.3.

F.2. Mediation

In the event the dispute has not been resolved by negotiation as provided herein, the disputing Parties may agree to participate in mediation, using a mutually agreed upon mediator. To the extent that the disputing Parties seeking mediation do not already include all Parties to this Agreement, the disputing Parties shall notify the other Parties to this Agreement of the mediation. The mediator will not render a decision, but will assist the disputing Parties in reaching a mutually satisfactory agreement. The disputing Parties agree to share equally the costs of the mediation.

G. Modification

The Parties by mutual agreement may modify the terms of this Agreement. Any such modification shall be in writing signed by all Parties.

V. MISCELLANEOUS PROVISIONS

A. Term of Agreement

The term of this Agreement will extend from its effective date through the end of fiscal year 2018 which is midnight on September 30, 2018.

B. Applicable Law

All activities undertaken pursuant to this Agreement must be in compliance with all applicable laws and regulations. No provision of this Agreement will be interpreted or constitute a commitment or requirement that the Action Agencies take action in contravention of law, including the APA, ESA, CWA, National Environmental Policy Act, Federal Advisory Committee Act, Information Quality Act, or any other procedural or substantive law or regulation. Federal law shall govern the implementation of this Agreement and any action, whether mediated or not.

C. Authority

Each Party to this Agreement represents and acknowledges that it has full legal authority to execute this Agreement.

D. Effective Date & Counterparts

The effective date of this Agreement shall be the date of execution by the last Party to provide an authorized signature to this Agreement. This Agreement may be executed in counterparts, each of which is deemed to be an executed original even if all signatures do not appear on the same counterpart. Facsimile and photo copies of this Agreement will have the same force and effect as an original.

E. Binding Effect

This Agreement shall be binding on the Parties and their assigns and successors. Each Party may seek dispute resolution in accordance with Section IV.F, or to withdraw in accordance with Section IV.E.3 if the dispute is not resolved.

F. No third party beneficiaries are intended by this Agreement.

G. All previous communications between the Parties, either verbal or written, with reference to the subject matter of this Agreement are superseded, and this Agreement duly accepted and approved constitutes the entire Agreement between the Parties.

H. Waiver, *Force Majeure*, Availability of Funds

H.1. The failure of any Party to require strict performance of any provision of this Agreement or a Party's waiver of performance shall not be a waiver of any future performance of or a Party's right to require strict performance in the future**.**

H.2. No Party shall be required to perform due to any cause beyond its control. This may include, but is not limited to fire, flood, terrorism, strike or other labor disruption, act of God or riot. The Party whose performance is affected by a *force majeure* will notify the other Parties as soon as practicable of its inability to perform, and will make all reasonable efforts to promptly resume performance once the *force majeure* is eliminated. If the force majeure cannot be eliminated or addressed, the Party may consider withdrawal pursuant to Section IV.E.3.

H.3 The actions of the Corps and Reclamation set forth in this Agreement are subject to the availability of appropriated funds. Nothing in this Agreement shall be construed to require the obligation or disbursement of funds in violation of the Anti-Deficiency Act.

I. Notice

I.1. Any notice permitted or required by the Good Faith provisions of this Agreement, Section IV.D, may be transmitted by e-mail or telephone to a Party's initial contact points, as that person is defined pursuant to the Good Faith provisions.

I.2. All other notices permitted or required by this Agreement shall be in writing, delivered personally to the persons listed below, or shall be deemed given five (5) days after deposit in the United States mail, addressed as follows, or at such other address as any Party may from time to time specify to the other Parties in writing. Notices may be delivered by facsimile or other electronic means, provided that they are also delivered personally or by mail. The addresses listed below can be modified at any time through written notification to the other Parties.

Notices to BPA should be sent to:

Vice President, Environment Fish & Wildlife
Mail Stop KE-4
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

Notices to the U.S. Army Corps of Engineers should be sent to:

U.S. Army Corps of Engineers, Northwestern Division
Chief, Planning, Environmental Resources and Fish Policy Support Division
1125 NW Couch Street
Suite 500
P.O. Box 2870
Portland, OR 97208-2870

Notices to the U.S. Bureau of Reclamation should be sent to:

Deputy Regional Director
Bureau of Reclamation
Pacific Northwest Region
1150 N. Curtis Rd., Suite 100
Boise, ID 83706

Notices to the State of Idaho should be sent to:

Administrator
Office of Species Conservation
300 North 6th Street, Suite 101
Boise, ID 83702

J. List of Attachments

Attachment A—BPA Funding for Idaho projects for FCRPS BiOp MOA (spreadsheet)
Attachment B—Narrative description and benefits of projects

SIGNATURES

/s/ Stephen J. Wright — *May 2, 2008*

Stephen J. Wright — Date
Administrator and Chief Executive Officer
Bonneville Power Administration

/s/ Steven R. Miles, P.E. — *May 2, 2008*

Steven R. Miles, P.E. — Date
Colonel, U.S. Army Corps of Engineers
Division Commander

/s/ Tim Personius — *May 2, 2008*

(for) J. William MacDonald — Date
Regional Director
U.S. Bureau of Reclamation
Pacific Northwest Region

/s/ C.L. "Butch" Otter — *May 1, 2008*

C.L. "Butch" Otter — Date
Governor
State of Idaho

ATTACHMENT A

BPA FUNDING FOR IDAHO PROJECTS FOR FCRPS BIOP MEMORANDUM OF AGREEMENT

#	PROJECT NAME	STATUS	BPA PROJECT No.	EXPENSE ($) 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
	SALMON & STEELHEAD ESA PROJECTS: EXPENSE													
1	Upper Lemhi River Acquisition and Habitat Restoration: Acquisition	New			$ 4,000,000	$ 5,000,000	$ 3,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,000,000
2	Upper Lemhi River Acquisition and Habitat Restoration: Restoration activities	New		$ -	$ -	$ -	$ -	$ 1,000,000	$ 1,000,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000	$ 3,200,000
3	Sockeye Conservation Hatchery Development: Planning *1	Expanded	200740200	$ 500,000	$ 500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,000,000
4	Sockeye Conservation Hatchery Development: O&M	Expanded	200740200	$ -	$ 100,000	$ 700,000	$ 717,500	$ 735,437	$ 753,823	$ 772,669	$ 791,985	$ 811,785	$ 832,080	$ 6,215,279
5	Pahsimeroi River Habitat Project	New		$ 700,000	$ -	$ 700,000	$ 700,000	$ 700,000	$ 700,000	$ 1,050,000	$ 1,050,000	$ 950,000	$ 950,000	$ 7,500,000
6	Water Transactions Fund	Expanded	200201301	$ 700,000	$ -	$ 700,000	$ 700,000	$ 700,000	$ 700,000	$ 1,050,000	$ 1,050,000	$ 1,000,000	$ 1,000,000	$ 7,600,000
7	Lower Clearwater River/Potlatch River Watershed Management Plan Implementation	New		$ 500,000		$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 750,000	$ 750,000	$ 500,000	$ 500,000	$ 5,000,000
8	Lower Lemhi River Habitat Restoration Project: Easements	New		$ -	$ -	$ -	$ -	$ 2,500,000	$ 2,500,000	$ -	$ -	$ -	$ -	$ 5,000,000
9	Lower Lemhi River Habitat Restoration Project: Habitat restoration	New		$ -	$ -	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 1,000,000
10	Nutrient Enhancement Project	New		$ -	$ -			$ 333,333	$ 333,333	$ 333,333	$ 333,333	$ 333,333	$ 333,333	$ 1,999,998
11	Steelhead Viability Assessments for ESA Recovery Metrics *2	Expanded	199005500	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 1,500,000
	YEARLY Totals:			$ 2,550,000	$ 4,750,000	$ 7,875,000	$ 5,892,500	$ 6,743,770	$ 6,762,156	$ 4,531,002	$ 4,550,318	$ 4,170,118	$ 4,190,413	$ 52,015,277

*1 Additional funds to BPA's 07-09 decision to support the PA

*2 Additional funds to BPA's 07-09 decision to support the PA

#	PROJECT NAME²	STATUS	BPA PROJECT No.	Capital ($) 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
	SALMON & STEELHEAD ESA PROJECTS: CAPITAL													
12	Sockeye Conservation Hatchery Development: Purchase	Expanded	200740200	$ 2,375,000	$ 2,375,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,750,000
13	Sockeye Conservation Hatchery Development: Construction	Expanded	200740200	$ -	$ 3,000,000	$ 5,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,500,000
	YEARLY Totals:			$ 2,375,000	$ 5,375,000	$ 5,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,250,000

ATTACHMENT B
IDAHO-BPA Project List
FOR IDAHO-ACTION AGENCY MOA
Upper Salmon and Clearwater Drainages

Priority	Project Title and Project Nos. as listed in Attachment A)	Project Description
1	Upper Lemhi River Acquisition and Habitat Restoration, Project Nos. 1 and 2	This project would permanently protect and restore chinook and steelhead habitat in the upper Lemhi River Watershed through the acquisition and protection of appropriate habitats in the Upper Lemhi Watershed and through the implementation of on-the-ground habitat improvements. Idaho would seek to obtain property that includes the mainstem Lemhi River in the heart of Chinook salmon spawning and rearing habitat and/or several critical tributaries. The goal would be to obtain habitat that would provide : • Year round access to up to 84 miles of previously inaccessible good quality spawning and rearing tributary habitat. • Up to an additional 190 miles of tributary habitat seasonally reconnected. • Up to 14 miles of mainstem Lemhi River and Big Springs Creek habitat upgraded via increased flows and riparian restoration. The draft FCRPS BiOp (Table 3-a and 3-b in Attachment B.2.2-2 Tributary Habitat Action Tables) has listed the following limiting factors for Lemhi River chinook salmon and steelhead: 1. Low stream flows 2. Water quality (high stream temperatures) 3. Fish passage (barriers and entrainment into irrigation ditches) 4. Substrate (sediment). Table 5 in the draft FCRPS BiOp Habitat RPA's identifies a 7% increase in freshwater survival for chinook salmon and 3% for steelhead for the 2007 – 2009 actions. However, the only BPA funded project identified in the draft BiOp currently implementing on-the-ground habitat projects in the Lemhi is the Fish Screening and Passage Improvements (The Screen Shop Program, BPA project 199401500). Specific actions designed to address the identified limiting factors and survival gaps include modifying, consolidating, and/or removing existing diversions to eliminate passage barriers and increase stream flow, installing fish screens on diversions, reconnecting tributaries, riparian habitat enhancement and fencing, culvert removal and/or replacement, instream habitat enhancement, channel reconfiguration, et al.
2	Conservation Hatchery Development,	This project would result in the acquisition and development of a new conservation hatchery facility designed to produce up to one million Snake River sockeye salmon smolts annually for reintroduction back to the habitat.

	Project Nos. 3, 4, 12 and 13	The flexibility to accommodate additional conservation hatchery programs as well as localized broodstock development programs would be incorporated into the design of the facility. The draft FCRPS (RPA Hatchery Strategy 2, Action 42) includes language specifically directing the Action Agencies to fund expansion of the safety-net program to increase sockeye salmon smolt releases to between 500,000 and 1 million fish annually. Anadromous adults that return to the program from increased reintroduction efforts will be used in controlled hatchery spawning events as well as released to the habitat to spawn naturally.
3	Pahsimeroi River Habitat Project, Project No. 5	This project would permanently protect and restore chinook and steelhead habitat in the lower Pahsimeroi River Watershed (downstream of Big Creek). The draft FCRPS BiOp (Table 3-a and 3-b in Attachment B.2.2-2 Tributary Habitat Action Tables) has listed the following limiting factors for Pahsimeroi River chinook salmon and steelhead: 1. Low stream flows 2. Water quality (high stream temperatures and excessive nutrients) 3. Fish passage (barriers and entrainment into irrigation ditches) 4. Substrate (sediment) 5. Poor riparian conditions (riparian area and LWD recruitment). Table 5 in the draft FCRPS BiOp Habitat RPA's identifies a 41% increase in freshwater survival for chinook salmon and 9% for steelhead resulting from the 2007 – 2009 actions. Specific actions designed to meet the identified limiting factors and survival improvements include conservation easements, acquisitions, modifying, consolidating, and/or removing existing diversions to eliminate passage barriers and increase stream flow, installing fish screens on diversions, reconnecting tributaries, riparian habitat enhancement and fencing, culvert removal and/or replacement, instream habitat enhancement, channel reconfiguration, spring, tributary, and mainstem channel restoration, et al.
4	Water Transactions Fund, Project No. 6	This program will use the Idaho Water Resource Board (IWRB) expertise to develop projects to address the primary limiting factor in the Lemhi and Pahsimeroi Basins, the lack of flow. Projects would be selected to address the freshwater survival improvements stated in the Biological Opinion (7% for chinook and 3% for steelhead in the Lemhi Drainage and 41% for chinook and 9% for steelhead in the Pahsimeroi Drainage). The projects would also be coordinated with existing planning documents (Subbasin Plan, Lemhi Conservation Plan, Nez Perce Settlement, etc.) and USBWP tech team input. The program would provide water to reconnect tributaries in the Lemhi and Pahsimeroi as well as increase flow in mainstem Lemhi and Pahsimeroi

		reaches to improve fish passage conditions and increase the quantity and quality of habitat. The IWRB has developed experience acquiring water in the Upper Salmon Basin through participation in the Water Entity/Columbia Basin Water Transactions Program (BPA Project Number 200201301) with funding from BPA and the Pacific Coast Salmon Recovery Fund. Water acquisition tools include short and long-term leases, permanent purchases, partial season leases, and diversion reduction agreements. The Board is also developing a sub-account in their Revolving Development Account to hold CBWTP-BPA funds for annual payments to irrigators. This mechanism provides financial accountability and IWRB coordination of policy and regulatory requirements necessary for effective water transactions. The program costs include: • Direct and indirect transaction costs for water acquisitions (leases, agreements, associated fees and charges) • Program management and negotiations for developing transactions • Monitoring programs to document effectiveness of transactions.
5	Lower Clearwater/Potlatch River Watershed Management Plan Implementation, Project No. 7	This project would accelerate the on-the-ground implementation of the recently completed Watershed Management Plan. Actions would focus on the primary limiting factors identified by NOAAF when it designated this watershed as the key watershed in the Clearwater for steelhead recovery and the limiting factors identified in the draft BiOp (Attachments B.2.2-2-Tributary Habitat Action Tables, Table 3-a. Snake river Steelhead 2007-2009 BPA Tributary Habitat Actions). These include: Riparian Areas and LWD Recruitment – impaired riparian condition and function; Stream substrate – elevated stream bed instability and elevated sediment; Floodplain connectivity and function – reduced floodplain connectivity, altered floodplain; and Channel structure. Specific actions designed to address these limiting factors include riparian and floodplain restoration and enhancement, riparian and floodplain conservation easements, acquisitions, reconnecting tributaries, removing migration barriers, instream habitat enhancement, summer streamflow improvement, et al.
6	Lower Lemhi River Habitat Restoration Project, Project Nos. 8 and 9	This project would permanently protect and restore chinook and steelhead habitat in the lower Lemhi River Watershed. The project would result in year round access to 66 miles of previously inaccessible good quality chinook and steelhead spawning and rearing habitat. The draft FCRPS BiOp (Table 3-a and 3-b in Attachment B.2.2-2 Tributary Habitat Action Tables) has listed the following limiting factors for Lemhi River chinook salmon and steelhead: Low stream flows Water quality (high stream temperatures) Fish passage (barriers and entrainment into irrigation ditches)

		Substrate (sediment). Table 5 in the draft FCRPS BiOp Habitat RPA's identifies a 7% increase in freshwater survival for chinook salmon and 3% for steelhead for the 2007 – 2009 actions. However, the only BPA funded project identified in the draft BiOp currently implementing on-the-ground habitat projects in the Lemhi is the Fish Screening and Passage Improvements (The Screen Shop Program, BPA project 199401500). Specific actions designed to meet the identified limiting factors and survival gaps include conservation easements, acquisitions, modifying, consolidating, and/or removing existing diversions to eliminate passage barriers and increase stream flow, installing fish screens on diversions, reconnecting tributaries, riparian habitat enhancement and fencing, culvert removal and/or replacement, instream habitat enhancement, channel reconfiguration, spring, tributary, and mainstem channel restoration, et al.
7	Nutrient Enhancement Project, Project No. 10	This project is a pilot study intended to pave the way for a larger-scale effort being spearheaded by NOAA scientists in collaboration with IDFG. The purpose of the larger study is to quantify the population-level benefits of nutrient addition and to determine the extent to which this technique can aid recovery. The objective of this project are: 1. Develop the expertise and experience with commercially available nitrogen nutrient sources to conduct nutrient enhancement projects in Idaho and secondarily and 2. Determine if the addition of such nutrients can measurably increase chinook and steelhead productivity in central Idaho streams (to be determined). Response variables include juvenile growth, density, and survival (to Lower Granite Dam and potentially to adult return). The approach will focus on release logistics and nutrient performance rather than fish monitoring. However, examination of a reduced set of fish parameters will enable a cursory evaluation of project success and lead the way for the more substantive assessments of larger proposed efforts. Ideally, this study would follow at least one year class of fish from emergence to emigration. This project will use a paired treatment/control approach on four streams in the Salmon or Clearwater river basins. Two streams will receive nutrients and two will serve as controls. Stream selection will involve preliminary measurement of stream chemistry to identify stream pairs with similar nutrient limitations. For this pilot study, we will target a 5-mile reach in streams with average summer flow of approximately 35 cfs.
8	Steelhead Viability Assessments for ESA Recovery Metrics, Project	This project focuses on status and trend monitoring of B-run steelhead populations in the Salmon and Clearwater drainages. The draft FCRPS BiOp has identified the need for additional monitoring for population productivity and abundance. RPA #50, bullet #5 states "Provide additional

	No. 11	status monitoring to ensure a majority of Snake River B-run steelhead populations are being monitored for population productivity and abundance." An existing project (199005500) will be modified to incorporate the objective of providing steelhead population status information, coordinated through the ongoing collaboration process to develop a regional strategy for RME. This project will collect life history, genetic, and abundance data for, and assess the status of, wild steelhead populations in Idaho to adequately address recovery objectives associated with the ESA (Viable Salmonid Population criteria: abundance, spatial structure, productivity, diversity).

APPENDIX B

Other BPA Projects in the Vicinity of the Proposed Springfield Sockeye Hatchery

Other Projects in the Project Vicinity

The following recently completed and reasonably foreseeable proposed projects are within the vicinity of the Springfield Sockeye Salmon Hatchery. These projects have been considered in the cumulative impact analyses for each environmental resource discussed in Chapter 3 of this EA.

Snake River Sockeye Captive Broodstock Program

The Snake River Captive Broodstock Program was founded in 1991 by the Idaho Department of Fish and Game and the National Marine Fisheries Service to prevent the extinction of Sockeye salmon. This project incorporates the use of hatchery facilities, captive broodstock technology, genetic support, and a comprehensive monitoring and evaluation plan to maintain the genetic resource and to continue rebuilding the number of Sockeye salmon in the natural environment.

Annually, the Snake River Captive Broodstock Program produces eggs, juveniles, and adults for reintroduction into natal waters (currently Redfish, Alturas, and Pettit lakes). The captive broodstock components are duplicated at facilities in Idaho (Eagle Fish Hatchery) and Washington (Manchester Research Station and Burely Creek Fish Hatchery).

Broodstock are collected at the Sawtooth Hatchery weir and at Redfish Lake. Eggs produced from annual spawning events at Eagle and Manchester hatcheries are transferred to either Oxbow Fish Hatchery in Oregon or to Sawtooth fish Hatchery in Idaho for continued culture and release. Although the Springfield Sockeye Hatchery would use fish collected as part of this program and would serve to broaden the goals of the program, the captive broodstock program is ongoing and would continue unrelated to construction and implementation of the Proposed Action.

Fort Hall Habitat Restoration Project

The Fort Hall Habitat Restoration Project began in 2009 as part of the Resident Fisheries Program in a partnership between the Bonneville Power Administration (BPA) and the Shoshone-Bannock Tribes. The Restoration Project included habitat enhancement, protection, and monitoring on the Fort Hall Indian Reservation in southeastern Idaho. Enhancement and protection work included sloping, fencing, planting wetland plugs along Spring Creek, and the repair of fences, rock barbs and wing dams. A study of the Fort Hall Bottoms was also conducted to monitor fish and wildlife populations. Additional work to develop a Geographic Information System overlay of critical fish and wildlife habitats is scheduled to continue into 2011. Additional work includes the monitoring of fish wildlife populations, the maintenance of fencing in the Bottoms area, genetic analysis of rainbow cutthroat hybrids, and the planting of 35,000 sagebrush plugs and 5,000 native riparian plants.

Salmon River Habitat Restoration Project

The Salmon River Habitat Restoration Project is a joint project in conjunction with the Shoshone-Bannock Tribes and the agencies involved in the Columbia Basin Fish Accord and 2008 Federal Columbia River Power System Biological Opinion. The Restoration Project occurred in 2009/2010 in southeastern Idaho and involved the reduction or elimination of man-

made impacts which included hydromodification and sediment delivery in order to enhance "*natural riparian function, stream temperatures and passage for all life stages of anadromous and resident fish in the Salmon Subbasin."* The work involved the realignment, connection and creation of a new channel and watershed for the rehabilitation of the Elk Creek Diversion. Future works includes the construction of two satellite facilities for the Fish and Wildlife Department, a fence maintenance agreement between Tribes and Montgomery Properties LLC to protect Panther Creek and Fourth of July Creek, and the continued restoration of the Salmon Subbasin on behalf of the Shoshone Bannock Tribes. Future work may also involve coordination with the US Army Corps of Engineers and Challis Bureau of Land Management on to enhance habitat for fish and return the Salmon River and its floodplain to healthy functioning, this project has many phases and is not currently underconstruction.

Crystal Springs Hatchery

The Crystal Springs Fish Hatchery and Programs for Snake River Chinook Salmon and Yellowstone Cutthroat Trout (Crystal Springs Hatchery) is currently being reviewed by the Northwest Power and Conservation Council as part of its three-step process (described in greater detail in Chapter 1 of this EA). The Crystal Springs Hatchery is being proposed in partnership between the Shoshone-Bannock Tribe and BPA to address decreasing populations of two species: Chinook salmon (*Oncorhynchus tschawytscha*) and Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*).

The Executive Summary of the Master Plan for the Crystal Springs Hatchery describes the intent of the program as follows:

> The Crystal Springs program is designed to help restore two native fish species of cultural and economic significance to the Tribes: Chinook salmon (*Oncorhynchus tschawytscha*) and Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*). Restoration will occur in geographically distinct regions of Idaho. Chinook salmon produced at Crystal Springs Hatchery will be acclimated and released in the Yankee Fork and in Panther Creek, both tributaries to the upper Salmon River. Yellowstone cutthroat trout produced at Crystal Springs Hatchery will be released in various streams on or near the Fort Hall Reservation.
>
> The proposed Chinook program is also designed to contribute to the recovery of the Snake River spring/summer Chinook Evolutionarily Significant Unit (ESU) by restoring a locally adapted hatchery and natural spawning population to the Yankee Fork and Panther Creek. While contributing to recovery is an important objective of the Tribes, regional efforts to recover the Major Population Group (MPG) have been largely directed at other systems in the upper Salmon. With other populations being the focus of species recovery, Yankee Fork and Panther Creek are suitable locations to establish populations that can support treaty-reserved tribal harvest, a very important Tribal program objective.
>
> The Tribes' goal for its proposed Yellowstone cutthroat trout program at Crystal Springs Hatchery is to (1) conserve the Yellowstone cutthroat trout population on tribal lands, (2) increase the abundance and range of pure Yellowstone cutthroat trout, and (3) provide hatchery fish for tribal and non-tribal harvest, thereby reducing human impacts on this

species. The program will implement a small-scale hatchery action to increase the distribution and abundance of Yellowstone cutthroat trout within a portion of the upper Snake River Basin. It is designed to produce fish that are as genetically and behaviorally similar to natural local populations as possible.

APPENDIX C

Water Quality Data

Key water quality parameters were measured during aquifer testing activities in November 2010

Average temperature (7 wells measured)	10.24° C
pH	6.9
Conductivity	565-595
Dissolved Oxygen (mg/L)	6.0 - 6.7
Dissolved Nitrogen (%)	107

Source IDFG 2010

Springfield Hatchery Wells Field Water Quality Parameter Data

Date	Time	Well No	Temp (°C)	pH	EC	SC	DO	TGP	BP
11/3/2010	14:00	3	10.9	6.92	405.5	565.4	6.7	648	657
11/3/2010	14:15	4	10.1	6.93	425.7	595.4	6.2	651	652
11/3/2010	14:08	5	10.1	6.93	412.9	576.4	6.5	652	657
11/4/2010	11:10	6	9.9	6.89	419.2	589.6	6	653	654
11/3/2010	15:10	7	10.5	6.92	408.6	564.9	6.2	650	657
11/3/2010	15:30	8	10.2	6.92	408	564.9	6.3	650	655
11/3/2010	15:35	9	10	6.93	405.7	568.7	6.2	650	657

EC = electrical conductivity (S/cm) SC = specific conductance (S/cm) DO = dissolved oxygen (mg/L) TGP = total gas pressure (mm Hg) BP = barometric pressure (mm Hg)

SPF Water Engineering, LLC. 2010

Springfield Hatchery Wells Laboratory Data

Analyte	Well 4	Well 9
Aluminum	<0.10	<0.10
Arsenic	<0.003	<0.003
Cadmium	<0.0005	<0.0005
Chromium	NA	NA
Copper	<0.01	<0.01
Iron	<0.05	<0.05
Lead	<0.005	<0.005
Magnesium	NA	NA
Manganese	<0.05	<0.05
Mercury	<0.0002	<0.0002
Nickel	<0.02	<0.02
Potassium	NA	NA
Silver	<0.001	<0.001
Sodium	NA	NA
Sulfur	NA	NA
Zinc	<0.01	<0.01
Nitrate (as N)	1.9	1.9
Ammonia (as N)	<0.04	<0.04
Nitrate + Nitrite (as N)	1.92	1.86
Nitrite (as N)	<0.01	<0.01
Total Kjeldahl Nitrogen (TKN)	<0.10	<0.10
Total Nitrogen	1.92	1.86
Alkalinity (CaCO3)	193	190
Fluoride	0.55	0.52
Sulfide	<0.05	<0.05
Total Dissolved Solids (TDS)	368	332
Total Suspended Solids (TSS)	<3	<3

Note: All values in mg/L; NA = not available at time of report preparation

SPF Water Engineering, LLC. 2010

State of Idaho water quality numeric standards

Beneficial use	Criteria		
	Dissolved oxygen	temperature	Turbidity
Cold water biota	>= 6.0 mg/l instantaneous	<= 22C, instantaneous; and <= 19C max daily avg	<= 50 NTU, instantaneous or, <= 25 NTU for > 10 consecutive days
Salmonid Spawning	1-day min >+ the greater of 6.0 mg/l or 90% saturation	<= 13C instantaneous and <9C max daily average	

State of Idaho water quality numeric standards (from Idaho Department of Environmental Quality Water Quality Standards and Wastewater Treatment Requirements)

Beneficial Use	Criteria				
	pH	Dissolved gas[1]	Chlorine[2]	Toxic substances[3]	Ammonia
Cold water biota	>=6.5 and 9.5	<=110% saturation	19.0 ug/l 1- hr avg 11.0 ug/L 4-day avg	<=CMC or CCC; <= Human health criteria	Varies[4]

[1]at atmospheric pressure at point of collectior

[2]total residual chlorine

[3]criteria from 40 CFR 13.136(b)(1) as modified by Section 250.07 of the Water Quality Standards And Wastewater Treatment Requirements;
CMC (Criteria Maximum Concentration) – maximum concentration for one hour, CCC C(criteria Continuous Concentration) –maximum concentration for four day

[4]varies according to temperature and pH

Effluent Limitations for the American Falls Reservoir Facility				
Facility Name	NPDES Permit Number	Parameter	Average Monthly (lbs/day)	Maximum Daily (lbs/day)
Crystal Springs Trout Farm	IDG130008	Net TSS	334.8	636.1
		Net TP	6.6	9.7
		Nitrogen[1]	36.9	61.5

[1]Total Kjeldahl nitrogen plus nitrate and nitrite

APPENDIX D

Greenhouse Gas Emissions Analysis Report

Project Greenhouse Gas Emissions Analysis Report
Springfield Sockeye Hatchery
ICF International
August 22, 2011

INTRODUCTION

Greenhouse gases (GHG) are chemical compounds found in the earth's atmosphere that absorb and trap infrared radiation, or heat, reradiated from the surface of the earth. The principal GHGs emitted into the atmosphere through human activities are carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), and fluorinated gases (U.S. Environmental Protection Agency 2010). The resulting build-up of heat in the atmosphere increases temperatures, warming the planet and creating a greenhouse-like effect (U.S. Energy Information Administration 2009b). Human activities are causing an increase in atmospheric concentrations of GHGs. Increasing levels of GHGs could increase the earth's temperature up to 7.2 degrees Fahrenheit (°F) by the end of the twenty-first century (U.S. Environmental Protection Agency 2010).

Carbon dioxide (CO2) is the major GHG emitted (U.S. Environmental Protection Agency2010; Houghton 2010). CO2 enters the atmosphere as a result of land use changes, through the burning of fossil fuels, including coal, natural, gas and oil, and wood products, and from the manufacturing of cement. CO2 emissions resulting from the combustion of coal, oil, and gas constitute 81% of all U.S. GHG emissions (U.S. Energy Information Administration 2009a). Before the industrial revolution, CO2 concentrations were roughly stable at 280 parts per million (ppm). By 2005, CO2 levels had increased to 379 ppm, a 36% increase, due to human activities (Intergovernmental Panel on Climate Change 2007).

Methane (CH4) is emitted during the production and combustion of fossil fuels, through intensive animal farming, and by the degradation of organic waste. Methane concentrations have increased 148% above pre-industrial levels (U.S. Environmental Protection Agency 2010).

Nitrous oxide (N2O) is emitted during agricultural and industrial activities, and during the combustion of fossil fuels and solid waste. Nitrous oxide atmospheric levels have increased 18% since the beginning of industrial activities.

Fluorinated gases, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6), are synthetic compounds emitted through industrial processes that use or manufacture these gases. They are used to replace ozone-depleting compounds such as chlorofluorocarbons in insulating foams, refrigeration, and air conditioning. Although they are emitted in small quantities, these gases have the ability to trap more heat than CO2 and are considered high

global-warming potential gases. Atmospheric concentrations of fluorinated gases have been increasing over the last two decades and are expected to continue (U.S. Environmental Protection Agency 2010).

Global atmospheric GHG concentrations are a product of emissions (release) and removal (storage) over time. Soils store carbon in the form of decomposing plant materials, serving as the largest carbon reservoir on land. When soils are disturbed, CO2, N20, and CH4 emissions increase (Build Carbon Neutral, 2010).

Through the process of photosynthesis, plants capture atmospheric carbon and store it in the form of sugars. As trees grow, carbon is removed from the atmosphere. As trees decay or are burned, the stored carbon is released into the atmosphere (Ecological Society of America 2008). Because forests and natural vegetation have an important role in carbon capture, storage and release, trees can be thought of as a temporary carbon reservoir. In a natural environment, tree and bush seeds would germinate and grow, storing carbon. Eventually the tree or bush would die and decay, releasing gaseous carbon. Under natural conditions, most dead trees are replaced with a new tree that would grow in its place, recreating a cyclical pattern of carbon storage and release. Peak solid carbon storage occurs when a tree is fully mature, and minimum solid carbon storage occurs immediately after the tree decomposes or burns. Loss of soil carbon storage also occurs when a forested area is permanently converted to a nonforested area, such as grasslands or a developed area such as building footprint or road surface.

REGULATORY THRESHOLDS FOR GREENHOUSE GAS EMISSIONS

EPA Mandatory Reporting Threshold

EPA's mandatory reporting threshold for annual CO2 emissions large stationary industrial sources is 25,000 metric tons of CO2 or CO2 equivalent (CO2e). Meeting or exceeding this threshold of emissions requires federal reporting of GHG emissions, but does not require any other action (Code of Federal Regulations, Title 40, Parts 86, 87, 89 et al.). This threshold is roughly the amount of CO2 generated by 4,400 passenger vehicles per year. GHG reporting protocols requires reporting of direct emissions (e.g., tailpipe) and indirect emissions (e.g., electricity use). Emissions from land use changes that result in the permanent removal of trees or vegetation are not considered as either direct or indirect emissions. Reporting of emissions resulting from land use changes is considered optional and, if reported, should not be added to direct or indirect emission calculations (The Climate Registry 2008). Although vegetation removal does not immediately emit GHGs and is not considered a direct emission, analysis of land use related emissions accounts for the permanent loss of a carbon storage reservoir when vegetation is permanently removed.

Council for Environmental Quality NEPA Guidance

The federal Council for Environmental Quality (CEQ) issued draft guidance for how federal agencies should address GHG emissions and climate change impacts in EAs and EISs (Council for Environmental Quality, 2010). The draft CEQ guidance recommends the following:

- Federal agencies should estimate direct GHG emissions. If the direct GHG emissions exceed 25,000 tons/year, then the agency should consider conducting a rigorous climate change evaluation for the project. CEQ emphasizes the 25,000 tons/year GHG value is not considered an impact threshold, but is only an "evaluation threshold" that might warrant more rigorous evaluation.

- Federal agencies should consider the potential impacts of future climate change on operation of the proposed action. For example, if the proposed action requires a reliable source of water supply, then the EA or EIS should consider whether future changes in available water resources could affect the proposed project.

PROJECT ACTIVITIES THAT WOULD CONTRIBUTE TO GHG EMISSIONS

Idaho Department of Fish and Game and BPA propose to upgrade the Springfield Hatchery. Implementation of Proposed Action would contribute to an increase in GHG concentrations through the following activities, each discussed in more detail below:

- during construction, "soil carbon" emissions produced through the removal and/or disturbance of natural vegetation and soils;

- during construction, through the use of gasoline- and diesel-powered vehicles, including cars, trucks, construction equipment, and helicopters;

- during ongoing operation and maintenance, through the use of gasoline- and diesel-powered vehicles for employee commuting, supply deliveries, and to transport smolt to the receiving waters.

- during operation, indirect GHG emissions would be generated at the fossil-fueled power plants used by Idaho Power to provide electricity to the regional grid, from which the hatchery will buy its power.

METHODS USED TO CALCULATE GHG EMISSIONS

Construction Assumptions and Calculation Methods

For purposes of calculating GHG emissions, construction for the Proposed Action was assumed to take 2 construction seasons as follows: facility grading (June-September 2012), Asphalt paving (September-October 2012), building erection (June-October 2013), and architectural coating (October-November 2013).

Structures to be constructed include three new single-family dwellings plus approximately 15,000 square feet of industrial buildings. The type and number of diesel-powered off-road construction equipment for each construction phase was estimated using the default assumptions from the URBEMIS2007 construction emission model (URBEMIS, 2011), supplemented by engineering judgment for certain specialized equipment. URBEMIS output reports listing the construction emission calculations are attached. Table 1 summarizes the number of pieces of off-road construction equipment that were assumed for the URBEMIS2007 model.

Table 1. Off-Road Construction Equipment Assumed for GHG Calculations

Fine Grading and Basin Excavation
1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day
1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day
1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day
Building Construction and Hatchery Construction
1 Well Drill Rig for pump installation (150 hp) operating at a 0.75 load factor for 2 hours per day
1 Cement and Mortar Mixers (50 hp) operating at a 0.56 load factor for 8 hours per day
1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
1 Excavators (168 hp) operating at a 0.57 load factor for 4 hours per day
2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 4 hours per day
2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
1 Trenchers (63 hp) operating at a 0.75 load factor for 4 hours per day
3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day
Site Paving
4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction-related haul trips for imported select fill, concrete, asphalt, and building materials were assumed to require a 100-mile round trip. Construction worker commute trips were estimated at 4,000 round trips (an average of 20 onsite workers for 200 construction days) with a 100-mile trip distance.

Fuel consumption rates are based off the average fuel economy for standard pick-up large diesel-powered delivery trucks of 8 miles per gallon (mpg) and gasoline-powered commute vehicles of 25 mpg. This is likely a conservative overestimation as more efficient vehicles may occasionally be used.

Emission factors for GHG constituents (CO2, CH4 and N20) emitted from diesel fuel combustion and gasoline combustion were derived from the California Climate Action Registry Protocol (The Climate Registry, 2008). The following Global Warming Potential (GWP) factors were used to convert the mass emission rates for each constituent to "equivalent carbon dioxide" or CO2-eq: CO2 = 1.0; CH4 = 21; N2O = 310.

Land clearing for the Proposed Action was assumed to permanently remove up to 5 acres of shrubland. The "soil carbon" emissions resulting from permanent removal of the shrubland were estimated using the Build Carbon Neutral Carbon Calculator (Build Carbon Neutral, 2010). The output report for the Build Carbon Neutral program used to estimate initial soil carbon losses due to permanent land clearing is shown in Attachment B.

The annualized CO2-eq GHG emissions generated during the one-time construction period were amortized over a 10-year operating period, for purposes of adding to the annual emissions from long-term facility operation.

Operations and Maintenance Assumptions

During operation and maintenance of the hatchery, the following activities would generate GHG emissions:

- The facility would use an average of 1,850 MW-hrs/year of electricity, provided by Idaho Power from its regional utility grid (Reiser personal communication). Idaho Power indicates roughly ½ of its produced electricity is generated by fossil-fuel power plants, with a resulting GHG emission factor of 1,092 pounds of CO2 per kW-hr of electricity (Idaho Power Company, 2011). The relatively small emission rates for the other GHG constituents emitted during coal combustion (CH4 and N2O) were estimated using emission factors from the California Climate Action Registry Protocol (The Climate Registry, 2008).

- Employee commutes were assumed to generate 624 round trips per year with an average distance of 100 miles. Employees were assumed to commute in vehicles with an average fuel economy of 25 mpg.

- Deliveries of supplies to the hatchery and waste hauling from the hatchery were assumed to generate 88 round trips per year with an average distance of 100 miles. Transport of smolt to the receiving waters was assumed to generate up to 60 haul trips per year, with one-way haul distances ranging from 231 miles to 248 miles. Diesel powered haul trucks were assumed to have a fuel economy of 8 mpg.

RESULTS

GHG emissions were calculated using the methodology described above. Emission calculation spreadsheets are shown in Attachment C. Initial construction-phase emissions were amortized over a 10-year period for purposes of comparing to long-term operational emissions. Table 2 summarizes the estimated GHG emissions. Emission rates are displayed for each of the GHG constituents (CO2, CH4 and N2O), and the overall weighted GHG emissions are expressed as tons/year of equivalent CO2-eq.

Table 2. Summary of GHG Emissions from Project Construction and Project Operation

Emission Category	Unweighted Emissions, tons/yr			Equivalent CO2-Eq Emissions, tons CO2eq/yr			
	CO2	CH4	N20	CO2	CH4	N20	CO2-eq
Initial Construction-Phase							
Subtotal Off-Road Construction Equipment	385	0.025	0.011	385	0.53	3.52	389
Subtotal Soil Carbon (5 acres permanent vegetation loss)	221	0	0	221	0	0	221
Subtotal Construction Vehicles on Public Roads	351	0.026	0.013	351	0.54	3.97	355
Total Initial Construction (2-years)	957	0.051	0.024	957	1.07	7.49	965
Annualized Construction Emissions Amortized Over 10-Year Operating Period	96	0.0051	0.0024	96	0.11	0.75	97
Long-Term Operational Phase							
Operational Worker Commute and Facility Deliveries	44	0.0034	0.0017	44	0.07	0.53	44
Operational Egg and Smolt Hauling to Receiving Lakes	26	0.0015	0.0007	26	0.03	0.21	26
Operational Electricity Purchases	1,010	0.011	0.017	1,010	0.23	5.36	1,016
Total Emissions from Operational Phase	1,080	0.016	0.020	1,080	0.329	6.094	1,086
Total Annualized Emissions	**1,176**	**0.021**	**0.022**	**1,176**	**0.44**	**6.84**	**1,183**
Draft Council for Environmental Quality NEPA Guidance "Evaluation Threshold"							**25,000**

Construction-Related GHG Emissions

Table 2 and Table 3 show the GHG emission calculations for worker commute vehicles and construction delivery trucks for the initial 2-year construction activities. The output report for the URBEMIS20007 model is provided in Attachment A. The output report for the Build Carbon Neutral program used to estimate initial soil carbon losses due to permanent land clearing is shown in Attachment B.

As listed in Table 2, initial construction would generate an aggregate total of 965 tons of equivalent CO2-eq during the 2-year construction period. Of this total amount, one-time vegetation removal would contribute soil carbon emissions of 221 tons of CO2. Amortized over a 10-year operational period, the aggregated construction activity would generate an estimated annualized emission rate of 97 tons/year of CO2-eq.

Table 3. GHG Emissions from Construction-Phase Commute Vehicles and Delivery Trucks

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	**Trips Per Year**	**One-Way Distance, miles**	**Annual Round-Trip VMT/year**	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Construction Worker Commute (Gasoline)	4000	50	400,000	25	16,000	8.81	8.15E-04	4.43E-04	1	21	310	155.06	1.43E-02	7.79E-03	155.06	0.301	2.414	157.77
Grubbing and Demolition Debris Hauling (Diesel)	30	50	3,000	8	375	10.15	5.80E-04	2.60E-04	1	21	310	4.19	2.39E-04	1.07E-04	4.19	0.005	0.033	4.23
Select Fill Hauling (Diesel)	345	50	34,500	8	4,313	10.15	5.80E-04	2.60E-04	1	21	310	48.15	2.75E-03	1.23E-03	48.15	0.058	0.382	48.59
Concrete Hauling Trucks (Diesel)	609	50	60,883	8	7,610	10.15	5.80E-04	2.60E-04	1	21	310	84.97	4.86E-03	2.18E-03	84.97	0.102	0.675	85.75
Building Material Delivery Trucks (Diesel)	200	50	20,000	8	2,500	10.15	5.80E-04	2.60E-04	1	21	310	27.91	1.60E-03	7.15E-04	27.91	0.033	0.222	28.17
Asphalt Hauling Trucks (Diesel)	108	100	21,667	8	2,708	10.15	5.80E-04	2.60E-04	1	21	310	30.24	1.73E-03	7.75E-04	30.24	0.036	0.240	30.51
Totals	**5,292**		**540,050**	--	**33,506**	--	--	--	--	--	--	**350.5**	**0.0255**	**0.01279**	**350.5**	**0.5358**	**3.966**	**355.0**
Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009																		
Select fill hauling: 3,450 cy in 10 cy trucks																		
Concrete hauling: 3,650 cy in 6 cy trucks																		
Asphalt hauling: 650 cy in 6 cy trucks																		

Operations and Maintenance Related GHG Emissions

Table 4 shows the annual emissions from on-road vehicles used for worker commuting and delivery trucks during the operational phase. Table 5 shows the operational-phase GHG emissions generated by haul trucks delivering eggs to the hatchery and smolt to the receiving waters. Table 6 shows the forecasts of monthly electricity forecasts for the facility. Table 7 shows indirect GHG emissions emitted from the Idaho Power fossil-fueled power plants used to produce the electricity the hatchery would purchase from Idaho Power.

As listed in Table 2, operation and maintenance of Proposed Action would result in an estimated 1,086 tons/year of equivalent CO2-eq. Of that total, the majority (1,016 tons/year) would result from indirect emissions from Idaho Power's fossil-fueled utility power plants used to produce the electricity the hatchery would purchase from Idaho Power.

Combined Direct Plus Indirect GHG Emissions From Construction and Operation

The project would generate a total of 1,183 tons/year of CO2-eq from the combination of amortized construction-phase emissions plus long-term operational emissions.

Table 4. GHG Emissions from Worker Commute and Supply Trucks for Operation and Maintenance

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	**Trips Per Year**	**One-Way Distance, miles**	**Annual Round-Trip VMT/year**	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Operational Worker Commute (Gasoline)	624	50	62,400	25	2,496	8.81	8.15E-04	4.43E-04	1	21	310	24.19	2.24E-03	1.21E-03	24.19	0.047	0.377	24.61
Operational Delivery Trucks (Diesel)	36	50	3,600	8	450	10.15	5.80E-04	2.60E-04	1	21	310	5.02	2.87E-04	1.29E-04	5.02	0.006	0.040	5.07
Waste Hauling Trucks (Diesel)	52	100	10,400	8	1,300	10.15	5.80E-04	2.60E-04	1	21	310	14.51	8.29E-04	3.72E-04	14.51	0.017	0.115	14.65
Totals	**712**		**76,400**	--	**4,246**	--	--	--	--	--	--	**43.7**	**0.0034**	**0.00172**	**43.7**	**0.0704**	**0.532**	**44.3**

Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009

Table 5. On-Road GHG Emissions From Egg and Smolt Deliveries

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	Deliveries Per Year	One-Way Distance, miles	Annual Round-Trip VMT/year	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Egg Deliveries	1	250	500	25	20	8.81	5.80E-04	2.60E-04	1	21	310	0.19	0.0000	0.0000	0.19	0.000	0.002	0.20
Redfish Lk	13	248	6,448	8	806	10.15	5.80E-04	2.60E-04	1	21	310	9.00	0.0005	0.0002	9.00	0.011	0.071	9.08
Alturas Lk	13	231	6,006	8	751	10.15	5.80E-04	2.60E-04	1	21	310	8.38	0.0005	0.0002	8.38	0.010	0.067	8.46
Pettit Lk	13	236	6,136	8	767	10.15	5.80E-04	2.60E-04	1	21	310	8.56	0.0005	0.0002	8.56	0.010	0.068	8.64
Totals	**39**		**18,590**	--	**2,324**	--	--	--	--	--	--	**25.9**	**0.0015**	**0.0007**	**25.9**	**0.0311**	**0.206**	**26.2**

Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009

Smolt shipments = "up to 40 per year" distributed evenly between the three receiving lakes

Table 6. Forecast Electricity Purchases

6a: Average kW of Electrical usage

Process	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Lighting and HVAC	200	200	200	200	200	200	200	200	200	200	200	200
Pumps - kw	90	90	135	135	135	135	180	45	45	45	45	90
Chiller and Booster Pumps - kw					50	50	50	50				

6b: Average Hrs/Day

Process	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Lighting and HVAC	12	12	12	12	12	12	12	12	12	12	12	12
Pumps - kw	24	24	24	24	24	24	24	24	24	24	24	24
Chiller and Booster Pumps - kw	24	24	24	24	24	24	24	24	24	24	24	24

6c: kW-hrs/Month and Annual kW-hrs/yr

Process	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Annual
Lighting and HVAC	72,000	72,000	72,000	72,000	72,000	72,000	72,000	72,000	72,000	72,000	72,000	72,000	864,000
Pumps - kw	64,800	64,800	97,200	97,200	97,200	97,200	129,600	32,400	32,400	32,400	32,400	64,800	842,400
Chiller and Booster Pumps - kw	0	0	0	0	36,000	36,000	36,000	36,000	0	0	0	0	144,000
											Total kW-hrs/yr		1,850,400
											Total MW-hrs/yr		1,850

Table 7. Indirect GHG Emissions from Purchasing Idaho Power Company Electricity

Annual Electricity Use, MWhr/year	Idaho Power EF, lbs/MW-hr			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
	CO2	CH4	N20	CO2	CH4	N20	CO2	CH4	N20	CO2	CH4	N20	CO2-eq
1,850	1092	1.17E-02	1.87E-02	1	21	310	1010	0.0108	0.0173	1010	0.227	5.356	1016

CO2 emission factor from Idaho Power 2011 Integrated Resource Plan

CH4 and N20 emission factors scaled from CO2 emission factor from Tables C.7 and C.8 of CCAR General Reporting Protocol, January 2009

Comparison to Federal Guideline Values

The sum of the amortized annualized construction emissions plus the annual operational emissions produces a total annual GHG emission rate of only 1,161 tons/year of CO2-eq. This GHG emission rate translates to the annual GHG emissions from 188 passenger vehicles. That grand total emission rate is only a small fraction of the 25,000 tons/year "evaluation threshold" recommended by the CEQ Greenhouse Gas Guidance.

Given this low amount of contribution, the impact of operation and maintenance activities on GHG emissions and worldwide GHG concentrations would be considered low.

VULNERABILITY AND ADAPTATION: POTENTIAL IMPACTS OF FUTURE CLIMATE CHANGE ON HATCHERY OPERATION

The consensus among the scientific community is that future worldwide climate change could alter existing meteorological patterns of local precipitation, local snow pack and snowmelt, local hydrology, and local groundwater recharge (Intergovernmental Panel on Climate Change 2007). As a result, it is possible that worldwide climate change could affect the future seasonal patterns of groundwater flowrate from the artesian wells from the East Snake Plain aquifer used as water supply for the Proposed Action.

As described in Section 3.5, Water Quality and Water Quantity, water levels in the artesian East Snake Plain aquifer have been gradually dropping and are expected to drop considerably over the next 20 years as a result of several factors, one of which is future changes in precipitation patterns. If required to compensate for these forecast aquifer changes, the hatchery plans to add wellhead pumps to additional artesian wells to maintain the required water supply.

Because the hatchery has feasible options to compensate for potential future decreases in water supply, the potential impacts caused by future climate change are considered to be low.

SUMMARY

GHG reporting protocols and accounting principles dictate direct emissions (e.g., tailpipe) and indirect emissions (e.g., electricity use) be reported cumulatively within associated documents.

Emissions resulting from biomass combustion or land-use changes, however, are considered optional for reporting and, if reported, should not be added to direct or indirect emission calculations (The Climate Registry 2008). Total direct and indirect GHG emissions associated with the combined construction and operation of the Proposed Action are only 1,183 tons/year of equivalent CO2-eq. That emission rate is only as small fraction of the 25,000 tons/year "evaluation threshold" recommended by the CEQ

Greenhouse Gas Guidance. Given this low amount of contribution, the Proposed Action's impact on GHG emissions and worldwide GHG concentrations would be considered low.

Regardless, BPA acknowledges that emissions from the Proposed Action could contribute to cumulative worldwide greenhouse gas emissions. Therefore, the mitigation measures described below are proposed to reduce the GHG emissions caused by construction and operation of the Proposed Action.

RECOMMENDED MITIGATION MEASURES

The following mitigation measures would reduce the Proposed Action's GHG emissions.

- Implement vehicle idling and equipment emissions measures.
- Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.
- Encourage the use of the proper size of equipment for the job.
- Use alternative fuels for stationary equipment at construction sites such as propane or solar, or use electrical power where practicable.
- Recycle or salvage nonhazardous construction and demolition
- Use local sources for rock for facility construction.

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ATTACHMENT A
URBEMIS 2007 CONSTRUCTION EMISSIONS OUTPUT REPORT

7/29/2011 3:20:25 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: Springfield Hatchery

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2013 TOTALS (tons/year unmitigated)	130.05
2014 TOTALS (tons/year unmitigated)	254.81

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

CO2

2013	130.05
Fine □rading 06/01/2013-09/01/2013	111.38
Fine □rading Dust	0.00
Fine □rading Off Road Diesel	106.40
Fine □rading On Road Diesel	0.00
Fine □rading □ or□er Trips	4.99
Asphalt 09/02/2013-10/02/2013	18.67
Paving Off-□as	0.00
Paving Off Road Diesel	14.63
Paving On Road Diesel	1.69
Paving □ or□er Trips	2.35
2014	254.81
Building 06/01/2014-10/31/2014	254.26
Building Off Road Diesel	208.32
Building Vendor Trips	26.54
Building □ or□er Trips	19.40
Coating 11/01/2014-12/31/2014	0.55
Architectural Coating	0.00
Coating □ or□er Trips	0.55

Phase Assumptions

Phase: Fine □rading 6/1/2013 - 9/1/2013 - Default Fine Site □rading Description

Total Acres Disturbed: 11.33

Ma□imum Daily Acreage Disturbed: 2.83

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truc Travel (VMT): 0

Off-Road E uipment:

1 E cavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 raders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Do ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Tractors/Loaders/Bac hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 ater Truc s (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 9/2/2013 - 10/2/2013 - Default Paving Description

Acres to be Paved: 2.83

Off-Road E uipment:

4 Cement and Mortar Mi ers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving E uipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Bac hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 6/1/2014 - 10/31/2014 - Default Building Construction Description

Off-Road E uipment:

1 Bore/Drill Rigs (150 hp) operating at a 0.75 load factor for 2 hours per day

1 Cement and Mortar Mi ers (50 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

1 E cavators (168 hp) operating at a 0.57 load factor for 4 hours per day

2 For lifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 enerator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 4 hours per day

2 Tractors/Loaders/Bac hoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 4 hours per day

3 □ elders (45 hp) operating at a 0.45 load factor for 8 hours per day

1 □ ater Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Architectural Coating 11/1/2014 - 12/31/2014 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential E□terior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential E□terior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

ATTACHMENT B
SOIL CARBON EMISSION CALCULATIONS FROM BUILD CARBON NEUTRAL CARBON CALCULATOR

Construction Carbon Calculator Results

Approximate net embodied CO2 for this project is

201 metric tons.

Your Entries

Total Square Feet	0
Stories Above Grade	NA
Stories Below Grade	NA
System Type	wood
Ecoregion	North American Deserts
Existing Vegetation Type	Shrubland
Installed Vegetation Type	Short Grass or Lawn
Landscape Disturbed (SF)	218,000
Landscape Installed (SF)	0

No building was detected so the calculation is only for the site - landscape disturbance and installation. If you meant to include a building please try again and make sure to enter a valid number for total square feet.

Construction Carbon Calculator formula version 0.03.5, last updated 2007.10.11. These results are an approximation. Your actual carbon footprint may vary. See assumptions for more information.

reduce & renew | calculate | offset | about the calculator | assumptions | faq | send feedback

About the Construction Carbon Calculator.

The Difference | How it Works | Why it Matters

What Makes this Calculator Different?

The Construction Carbon Calculator estimates embodied carbon. Embodied carbon is the carbon released when a product is manufactured, shipped to a project site and installed. This calculator looks at an entire project, and takes into account the site disturbance, landscape and ecosystem installation or restoration, building size and base materials of construction. It does this simply, requiring only basic information that is available to a project team very early in the design process.

The calculator provides an estimate that establishes a base number to clarify the carbon implications of the construction process - to be used as tool to address the reduction of that footprint. The results you obtain will be an estimation and approximate - accurate within 25%, plus or minus.

How it Works

This first version of the carbon landscape model conservatively estimates the potential of the landscape to release and sequester carbon. (Please see the assumptions for more detail.) The Calculator's estimation demonstrates the role of the immediate landscape in the site carbon footprint and how it should be considered in the whole site design.

The value of the building carbon model will also increase through user input and more data sets. The base model takes the overall building square footage and divides it evenly between floors. A higher carbon footprint per square foot has been assumed for stories below grade to account for excavation work and soil removal from the site.

A complete life cycle analysis will provide more precise carbon quantities. There are various cost consultants, environmental consultants and life cycle software programs that will allow an interested party to generate a more accurate estimate of embodied carbon, however, we are not aware of one that will also address landscape impacts.

We hope to further develop the formula (see next steps) and welcome suggestions on improving it.

Why It Matters

Why is embodied carbon important?

13-18% of the total embodied carbon footprint of any construction project (UNEP, 2007) and 100% of the total embodied carbon footprint of any landscape project is released the year the project is built or installed.

The remainder of the carbon footprint is the operational carbon released and the landscape carbon sequestered over the life of the project, typically 30 to 80 years.

Air travel represents about 13% of the total global transportation carbon footprint, and about 2% of the total overall global carbon footprint (Tufts, 2006). Embodied carbon in non-residential buildings contributes about 19% of the total overall global carbon footprint in the United Kingdom (BioRegional Development Group BedZed toolkit) making embodied construction carbon a significant percentage of the overall total. Embodied construction carbon is a more significant factor than air travel, and has an equally immediate impact.

Why is landscape significant? The ecoregion and the maintenance of landscaping both have an impact on the quantity of carbon that can be sequestered there. Certain landscapes, like wetlands, have the capacity to store significant amounts of carbon. This carbon is released when the landscape is disturbed or destroyed. Landscape should be considered in conjunction with the building and site design and can be a key element of carbon sequestration. This calculator is the first to allow landscape impacts to be quantified and applied to the full project embodied carbon footprint.

What about operational carbon? Operational carbon is a footprint that increases over the life of a building. Building design and the behavior of building occupants can greatly reduce that operational carbon footprint. The remaining carbon footprint can be addressed through the purchase of green power - power from renewable energy sources. Any carbon footprint not addressed this way can be offset. There are many carbon calculators and offset retailers that address operational carbon.

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Assumptions

Buildings, sites and construction processes vary widely – we've done our best to create an easy to use calculator for generating an estimate from averaged data. This will provide a rough approximation of the carbon load - not an exact one. Here are the assumptions made for the current iteration of the Construction Carbon Calculator. We welcome your feedback!

1. The calculator is accurate to about 25%, plus or minus. (This is similar to most operational carbon calculators.)
2. Landscape data are for soil organic carbon (SOC) only and do not include above ground biomass (trees, shrubs and grasses).
3. Disturbed soil retains an amount of residual carbon. This carbon factor has been accounted for in both the disturbed soil and the installed landscape accounting.
4. The land use categories are very broad and refer largely to mature natural landscapes - 5 years for grasslands, 10 years for shrublands and 30 years for forests.
5. The data are taken from a number of published references. Where there is a range for any vegetation type/ecoregion cell, the mid point is taken.
6. This takes no account of the variation of soil characteristics within each ecoregion.
7. This does not include data for conventional landscaped systems, which can vary considerably depending on inputs - the nearest vegetation type should be used (e.g. for a urban park use savanna/parkland; lawns use shortgrass/lawn).

8. Numbers have been built from a combination of project cost estimates including quantities and available web-based resources of embodied carbon intensity ratios of different building materials.

9. The building data takes into account site excavation, shell and core (structural systems, building envelope and building systems). Tenant improvements, interiors or furniture, fixtures or equipment have not been included in version 0.01.

10. These carbon cost estimates are based primarily on commercial or multi-family projects. Residential projects may vary from these results.

11. The building data is based on Life Cycle Balancing: Building Shell, Interiors, & Furnishings Sub-Systems: Nursing and Biomedical Sciences Building, the University of Texas at Houston Health Sciences Center from the Center for Maximum Potential Building Systems. They had the following factors for different building elements: Shell - 24%, Service Systems - 22%, Service Sector - 14%, Substructure - 5%, Other/ Miscellaneous - 17%. This is 70% of the total for a complete building including interiors, but covers the materials being quantified in our analysis. Our breakdown was slightly different, taking into account the specific building elements for which we were able to accumulate data, and extrapolating the unknown factors. Our factors were as follows: Shell Known - 12%, Shell Unknown - 12%, Service Systems - 22%, Service Sector - 14%, Substructure Known - 2%, Substructure Unknown - 3%, Other/ Miscellaneous - 5%.

12. Building square footage intensity values have been generated from cost estimate data for excavation, steel, concrete and wood and material carbon intensity ratios.

13. Wood values assume non-certified wood sources. The values for the wood represent the carbon released converting the wood from a natural forested state to an installed condition. Certified wood will compensate for the carbon released and allow the wood in a building to count as a carbon sink.

14. Some data sets used in developing version 0.01 were smaller than others. Averaged values were available for certain building structural types, but for others it was based on one or two actual buildings.

If you have some good ideas for improvements, we'd like to hear about it!

See also:

- References - sources used in development of the Construction Carbon Calculator formula.
- Next Steps - what we're planning for the future of this site, including expanded datasets and more detailed input options for the next version of the calculator.

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reduce & renew | calculate | offset | about the calculator | assumptions | faq | send feedback

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ATTACHMENT C
EMISSION CALCULATION SPREADSHEETS

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EMISSION CALCULATION SPREADSHEETS

Table X. Summary of Greenhouse Gas Emissions

Emission Category	Unweighted Emissions, CO2	CH4	N20	Equivalent CO2-Eq Emissions, CO2	CH4	N20	CO2-eq
Initial Construction-Phase							
Subtotal Off-Road Construction Equipment	385	0.025	0.011	385	0.53	3.52	389
Subtotal Soil Carbon (5 acres permanent vegetation loss)	221	0	0	221	0	0	221
Subtotal Construction Vehicles on Public Roads	351	0.026	0.013	351	0.54	3.97	355
Total Initial Construction (2-years)	957	0.051	0.024	957	1.07	7.49	965
Annualized Construction Emissions Amortized Over 10-Year Operating Period	96	0.0051	0.0024	96	0.11	0.75	97
Long-Term Operational Phase							
Operational Worker Commute and Facility Deliveries	44	0.0034	0.0017	44	0.07	0.53	44
Operational Egg and Smolt Hauling to Receiving Lakes	26	0.0015	0.0007	26	0.03	0.21	26
Operational Electricity Purchases	1,010	0.011	0.017	1,010	0.23	5.36	1,016
Total Emissions from Operational Phase	1,080	0.016	0.020	1,080	0.329	6.094	1,086
Total Annualized Emissions	**1,176**	**0.021**	**0.022**	**1,176**	**0.44**	**6.84**	**1,183**
Draft Council for Environmental Quality NEPA Guidance "Evaluation Threshold"							**25,000**

Egg Delivery and Fish Hauling GHG Emissions

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	Deliveries Per Year	One-Way Distance, miles	Annual Round-Trip VMT/year	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Egg Deliveries	1	250	500	25	20	8.81	5.80E-04	2.60E-04	1	21	310	0.19	0.0000	0.0000	0.19	0.000	0.002	0.20
Redfish Lk	13	248	6,448	8	806	10.15	5.80E-04	2.60E-04	1	21	310	9.00	0.0005	0.0002	9.00	0.011	0.071	9.08
Alturas Lk	13	231	6,006	8	751	10.15	5.80E-04	2.60E-04	1	21	310	8.38	0.0005	0.0002	8.38	0.010	0.067	8.46
Pettit Lk	13	236	6,136	8	767	10.15	5.80E-04	2.60E-04	1	21	310	8.56	0.0005	0.0002	8.56	0.010	0.068	8.64
Totals	**39**		**18,590**	--	**2,324**	--	--	--	--	--	--	**25.9**	**0.0015**	**0.0007**	**25.9**	**0.0311**	**0.206**	**26.2**

Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009

Smolt shipments = "up to 40 per year" distributed evenly between the three receiving lakes

Operational Commute and Delivery GHG Emissions

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	**Trips Per Year**	**One-Way Distance, miles**	**Annual Round-Trip VMT/year**	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Operational Worker Commute (Gasoline)	624	50	62,400	25	2,496	8.81	8.15E-04	4.43E-04	1	21	310	24.19	2.24E-03	1.21E-03	24.19	0.047	0.377	24.61
Operational Delivery Trucks (Diesel)	36	50	3,600	8	450	10.15	5.80E-04	2.60E-04	1	21	310	5.02	2.87E-04	1.29E-04	5.02	0.006	0.040	5.07
Waste Hauling Trucks (Diesel)	52	100	10,400	8	1,300	10.15	5.80E-04	2.60E-04	1	21	310	14.51	8.29E-04	3.72E-04	14.51	0.017	0.115	14.65
Totals	**712**		**76,400**	--	**4,246**	--	--	--	--	--	--	**43.7**	**0.0034**	**0.00172**	**43.7**	**0.0704**	**0.532**	**44.3**

Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009

Construction Commute and Delivery GHG Emissions

						EF, kg/gal			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
Destination	**Trips Per Year**	**One-Way Distance, miles**	**Annual Round-Trip VMT/year**	**Assumed Fuel Mileage, Miles/gal**	**Annual Fuel Usage, gal**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2**	**CH4**	**N20**	**CO2-eq**
Construction Worker Commute (Gasoline)	4000	50	400,000	25	16,000	8.81	8.15E-04	4.43E-04	1	21	310	155.06	1.43E-02	7.79E-03	155.06	0.301	2.414	157.77
Grubbing and Demolition Debris Hauling (Diesel)	30	50	3,000	8	375	10.15	5.80E-04	2.60E-04	1	21	310	4.19	2.39E-04	1.07E-04	4.19	0.005	0.033	4.23
Select Fill Hauling (Diesel)	345	50	34,500	8	4,313	10.15	5.80E-04	2.60E-04	1	21	310	48.15	2.75E-03	1.23E-03	48.15	0.058	0.382	48.59
Concrete Hauling Trucks (Diesel)	609	50	60,883	8	7,610	10.15	5.80E-04	2.60E-04	1	21	310	84.97	4.86E-03	2.18E-03	84.97	0.102	0.675	85.75
Building Material Delivery Trucks (Diesel)	200	50	20,000	8	2,500	10.15	5.80E-04	2.60E-04	1	21	310	27.91	1.60E-03	7.15E-04	27.91	0.033	0.222	28.17
Asphalt Hauling Trucks (Diesel)	108	100	21,667	8	2,708	10.15	5.80E-04	2.60E-04	1	21	310	30.24	1.73E-03	7.75E-04	30.24	0.036	0.240	30.51
Totals	**5,292**		**540,050**	**--**	**33,506**	**--**	**--**	**--**	**--**	**--**	**--**	**350.5**	**0.0255**	**0.01279**	**350.5**	**0.5358**	**3.966**	**355.0**

Emission factors: Table C.3 and Table C.6 of CCAR General Reporting Protocol, January 2009

Select fill hauling: 3,450 cy in 10 cy trucks

Concrete hauling: 3,650 cy in 6 cy trucks

Asphalt hauling: 650 cy in 6 cy trucks

GHG Emissions From Idaho Power Electricity Purchases

Electricity Use,	Idaho Power EF, lbs/MW-hr			GWP			Unadjusted Emiss, tons/yr			CO2-Eq Emissions, tons CO2eq/yr			
MWhr/year	CO2	CH4	N20	CO2	CH4	N20	CO2	CH4	N20	CO2	CH4	N20	CO2-eq
1,850	1092	1.17E-02	1.87E-02	1	21	310	1010	0.0108	0.0173	1010	0.227	5.356	1016

CO2 emission factor from Idaho Power 2011 Integrated Resource Plan

CH4 and N20 emission factors scaled from CO2 emission factor from Tables C.7 and C.8 of CCAR General Reporting Protocol, January 2009

Average kW of Electrical usage

Process	OCT	NOV	DEC	AN	FEB	MAR	APR	MAY	UN	UL	AU	SEP
Lighting and HVAC	200	200	200	200	200	200	200	200	200	200	200	200
Pumps - w	90	90	135	135	135	135	180	45	45	45	45	90
Chiller and Booster Pumps - w					50	50	50	50				

Average Hrs/Day

Process	OCT	NOV	DEC	AN	FEB	MAR	APR	MAY	UN	UL	AU	SEP
Lighting and HVAC	12	12	12	12	12	12	12	12	12	12	12	12
Pumps - w	24	24	24	24	24	24	24	24	24	24	24	24
Chiller and Booster Pumps - w	24	24	24	24	24	24	24	24	24	24	24	24

kW-hrs/Month and Annual kW-hrs/yr

Process	OCT	NOV	DEC	AN	FEB	MAR	APR	MAY	UN	UL	AU	SEP	Annual
Lighting and HVAC	72000	72000	72000	72000	###	72000	72000	72000	72000	72000	72000	72000	864,000
Pumps - w	64800	64800	97200	97200	###	97200	1E+05	32400	32400	32400	32400	64800	842,400
Chiller and Booster Pumps - w	0	0	0	0	###	36000	36000	36000	0	0	0	0	144,000
											Total kW-hrs/yr		1,850,400
											Total MW-hrs/yr		1,850

_WorkingFiles\Greenhouse Gas Calculations\[Springfield-Hatchery-GHG-Calcs_jmw_8-4-2011.xls]Springfield GHG