Northwest Power and Conservation Council



June 14, 2012

Mr. William C. Maslen
Manager, Fish and Wildlife Division
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Maslen,

On June 13, 2012 the Council approved the construction and operation of the *Springfield Sockeye Hatchery* associated with the *Snake River Sockeye Captive Propagation*, Project #**2007-402-00**. This recommendation is conditioned on IDFG addressing the ISRP recommendations (ISRP document 2012-7) prior to beginning fish culture activities in December 2013. The background and specific language associated with the recommendation by the Council is attached.

The Council appreciates the significant amount of effort made by the Idaho Department of Fish and Game and the Bonneville Power Administration during the development of this project, and we look forward to working with you to ensure this project is successful. If you have further questions, please call Mark Fritsch of the Central office staff.

Sincerely,

Tony Grover
Director, Fish and Wildlife Division

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**Steve Crow**
Executive Director

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**Attachment: Specific Language Approved by Council regarding the construction and operation of the Springfield Sockeye Hatchery, Project #2007-402-00 on June 13, 2012.**

**SIGNIFICANCE**

On April 26, 2012, the Idaho Department of Fish and Game (IDFG) submitted Step 2 and Step 3 documents to the Council for the *Springfield Hatchery Sockeye Program*, as part of Project #2007-402-00, *Snake River Sockeye Captive Propagation*.

The Master Plan (Step 1) associated with the sockeye program proposes to implement the next phase in the Snake River Sockeye Captive Broodstock Program by constructing the Springfield Hatchery near the town of Springfield in Bingham County, Idaho. The proposed hatchery addresses the needs as directed in the 2008 Federal Columbia River Power System (FCRPS) Biological Opinion and the 2008 Memorandum of Agreement (MOA) between the State of Idaho and the FCRPS Action Agencies.

The proposed hatchery will provide the capacity to expand the juvenile-fish production component of the program (up to 1 million smolts annually) for release in the Upper Salmon River Subbasin in the Sawtooth Basin. This production is intended to build on the success of the captive broodstock phase (Phase 1) and respond to population re-colonization goals in Redfish, Pettit, and Alturas lakes (Phase 2).

**BUDGETARY/ECONOMIC IMPACTS**

The costs presented in the combined Step 2 and Step 3 submittal are consistent with the Council's Major Project Review (Three-Step Review) Process. Future cost estimates for operations and capital construction from Step 1 (Master Plan) through the combined Step 2 and Step 3 submittal generally follow the principals for inflation and cost escalation described by the Independent Economic Analysis Board in their white paper on Project Cost Escalation Standards (IEAB document 2007-2). IDFG has chosen a design/build approach through the Step 2 preliminary and Step 3 final designs and worked with a technical team that represented construction firms, design engineers and fish culturists to develop the Step 3 final designs. This approach also utilized a value engineering process that has been incorporated into the final designs. It is important to note that the overall construction budget has not changed since the Master Plan was completed in 2010.

IDFG is proposing to construct new facilities at the Springfield, Idaho site. Cost estimates for facility planning and design, construction, acquisition of capital equipment, environmental compliance, operations and maintenance and research, monitoring, and evaluation are presented for each of the hatchery facilities. In addition, design and associated costs estimated for the Springfield Hatchery Sockeye Program has incorporated best management practices for culture of sockeye salmon.

Capital and expense funds for Springfield Hatchery development including planning and design, acquisition, construction, and operation and maintenance totaling $20,795,164[1] are reserved in MOA budgets between the State of Idaho and the FCRPS Action Agencies.

[1] This is for Fiscal Year 2008 - 2017 at $13,579,886 capital and $7,215,279 expense funds.

I. Project Costs

The total estimated cost for the Springfield Hatchery from Fiscal Year 2010 through Fiscal Year 2012 was about $6,095,481 and includes the master plan, land acquisition, conceptual, preliminary and final engineering designs and construction specifications, environmental review, and permitting estimates. Construction and management of all project elements for the Springfield Hatchery is estimated at about $13,579,886, assuming that project construction would be initiated in Fiscal Year 2012 and major construction and completion in Fiscal Year 2013. The cost estimates are in Fiscal Year 2012 dollars and should be considered final at +/- 10 to 15 percent.

The ongoing operations and maintenance (O&M) budgets for the project from Fiscal Year 2007 through Fiscal Year 2012 for the captive broodstock phase of the program averaged $1,700,929 (combined IDFG, SBT, NOAA and ODFW)[2]. The monitoring and evaluation (M&E) budgets associated with this phase from Fiscal Year 2007 through Fiscal Year 2012 averaged $971,470 (combined IDFG and SBT).

Future cost estimates reflect only O&M at Springfield Hatchery estimated to be about $550,059 annually. Related M&E expenses are estimated to be $143,806 annually. These estimates are in 2013 and 2014 dollars to reflect the anticipated construction and when these activities would be incurred, respectively. The combined Step 2 and Step 3 submittal shows these costs escalated at 2.5 percent annually through 2022.

The combined Step 2 and Step 3 provides a thorough summary of key project costs for Fiscal Year 2010 through Fiscal Year 2012 and a summary of future expenditures from Fiscal Year 2012 through Fiscal Year 2022 (see Attachment 1).

**BACKGROUND**

The current run of sockeye into the Snake River is one of three remaining populations in the Columbia River Basin; the other two populations, Okanogan Lake sockeye salmon and Wenatchee Lake sockeye salmon, are located in tributaries of the upper Columbia River.

Historically, five Sawtooth Basin lakes (Redfish, Alturas, Pettit, Stanley, and Yellowbelly) in the Upper Salmon River subbasin supported sockeye salmon. Historically, it was estimated that as many as 40,000 sockeye returned to the Upper Salmon River subbasin in some years. However, by 1962, sockeye salmon were no longer returning to Stanley, Pettit, and Yellowbelly lakes. By 1990, Redfish Lake was the only historical spawning and nursery lake still supporting a remnant anadromous run.

In response to this precipitous decline of Snake River sockeye salmon a petition was submitted in 1990 by the Shoshone-Bannock Tribes and in 1991 the sockeye were listed as endangered under the Endangered Species Act (ESA). In that same year, the IDFG initiated a captive broodstock program to maintain and prevent the extinction this species.

[2] All Snake River sockeye actions funded through the Program are addressed through Project #2007-402-00, *Snake River Sockeye Captive Propagation*.

The conservation efforts for Idaho sockeye focus on Redfish, Alturas, and Pettit lakes in the Sawtooth Basin located within the Sawtooth National Recreation Area. The lakes are glacial-carved and range in elevation from 6,512 to 7,014 feet, receive runoff from the Sawtooth and Smoky mountains, are considered ultra-oligotrophic, and lie in the headwaters area of the Salmon River watershed. The Salmon River flows into the Snake River, which in turn flows into the Columbia River, which drains into the Pacific Ocean. The Sawtooth valley is approximately 900 river miles from the mouth of the Columbia River. Redfish Lake is the largest of the three lakes, Pettit Lake is the smallest, and Alturas Lake is intermediate in surface area. Additionally, Redfish Lake supports the species' southernmost population within its recognized range.

Snake River sockeye rearing and spawning habitat in the Sawtooth Basin is considered to be in excellent condition as it is in an area that has experienced limited human impacts. Ongoing effects are related to recreational activities such as hiking, river rafting, fishing and hunting. A number of homes have been built around Redfish, Alturas and Pettit lakes and area parks, campgrounds and boat launches are popular destinations.

At the time of the initial listing in 1991, the greatest in-basin habitat problem faced by the ESU was probably the lack of access to any of the lakes but Redfish. The fish barriers on Alturas and Pettit Lake creeks (an irrigation intake and a concrete rough fish barrier, respectively) were modified to facilitate passage of anadromous sockeye into these historical habitats in the early 1990s.

Although access to the spawning and rearing lakes is now considered functional, large portions of the migration corridor in the mainstem Salmon River may periodically reach high temperatures in July and August and negatively impact the ability of adult sockeye salmon to reach spawning locations. To evaluate this uncertainty, the USFWS and NOAA's Northwest Fisheries Science Center have proposed a multi-year study to evaluate the migration survival of adult Snake River sockeye salmon from Lower Granite Dam to the Sawtooth Basin. Information generated by this project is expected to help inform decision making about when to consider trapping and transporting adult sockeye salmon to natal spawning areas. In addition, a project is being implemented, cooperatively between IDFG and NOAA that will characterize migration and survival of juvenile Snake River sockeye salmon between the upper Salmon River and Lower Granite Dam[3]. This project will provide information to managers on the relative success of juvenile release strategies employed by the sockeye salmon captive broodstock program.

In addition, the Salmon River Subbasin Plan identifies a list of problem statements, biological objectives, and strategies. The strategies and monitoring activities outlined in the Master Plan for the Springfield Hatchery sockeye program would contribute to meeting a number of the biological objectives identified in the Salmon River Subbasin Plan.

IDFG has submitted a proposed draft Snake River Sockeye Salmon Recovery Strategy to NOAA Fisheries for consideration in recovery planning. This strategy recommends incorporating hatchery facilities, captive broodstock technology, genetic support, and a comprehensive

[3] Project #2010-076-00, *Characterizing migration and survival for juvenile Snake River sockeye salmon between the upper Salmon River basin and Lower Granite Dam*. This project was recommended by the Council in June 2011, as part of the RME/AP category review.

monitoring and evaluation plan to maintain the current population and rebuild the number of naturally produced anadromous sockeye in the basin. NOAA's recovery plan for the Snake River sockeye salmon is anticipated in early 2014.

## I. History of the Snake River Sockeye Captive Broodstock Program

The IDFG initiated the captive broodstock and research efforts in 1991 and received Fish and Wildlife Program funding that same year (Project 1991-072-00). Initially, to guard against catastrophic loss at any one brood facility, the captive broodstock component of the program was duplicated at facilities in Idaho (IDFG Eagle Fish Hatchery) and Washington (NOAA Manchester Research Station and Burley Creek fish hatcheries) to provide eyed eggs to meet project conservation needs. The IDFG Sawtooth Hatchery and the ODFW Oxbow Fish Hatchery (near Cascade Locks, Oregon) currently provide 100 percent of the smolt production rearing space for this program. To date, broodstocks have been established from wild anadromous adults, wild residual sockeye salmon, hatchery-produced anadromous adults, and full-term hatchery-produced adults.

Current production of Snake River sockeye salmon is restricted, due to capacity, to broodstock maintenance at facilities in Idaho (IDFG Eagle hatchery) and Washington (NOAA facilities); insufficient incubation and rearing space continues to limit production of a necessary full-term smolt program. This limitation has prevented the current program from growing beyond the conservation phase.

Coordination of recovery efforts is carried out under the guidance of the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC), a team of technical experts representing the IDFG, NOAA Fisheries, and the Shoshone-Bannock Tribes. Further coordination takes place at the federal level through the ESA Section 10 permitting process. The Bonneville Power Administration provides coordination for the SBSTOC process.

Since 1995, the Shoshone Bannock Tribes have been supplementing nitrogen and phosphorus, and controlling non-native kokanee salmon competitors (i.e., for food resources) in the Sawtooth Basin lakes[4]. Based on annual water quality criteria and biological sampling, this management strategy appears to be increasing the carrying capacities of the lakes for rearing juvenile Snake River sockeye salmon as part of the recovery effort.

In 1999, the first hatchery-produced anadromous sockeye salmon returned to the program. In that year, seven age-3 adults (six males and one female) were trapped at weirs in the Sawtooth subbasin. In 2000, the program experienced its first significant return of hatchery-produced adults when 257 sockeye salmon returned to collection facilities on Redfish Lake Creek and the upper Salmon River at the IDFG Sawtooth Fish Hatchery. Between 2001 and 2011, over 3,490 hatchery-produced sockeye salmon adults returned to the Sawtooth Basin (Table 2).

[4] Project #1991-071-00, *Snake River Sockeye Salmon Habitat & Limnological Monitoring*. This project was merged to Project #2007-402-00 effective on 7/2/2007.

**Table 2. Hatchery and natural sockeye returns to Redfish Lake, 1999-2012.**

| Return Year | Total Return | Natural Return[5] | Hatchery Return | Observed (Not Trapped) | Naturals Kept for Broodstock | Hatchery Kept for Broodstock |
|---|---|---|---|---|---|---|
| 1999 | 7 | 0 | 7 | 0 | 0 | 7 |
| 2000 | 257 | 10 | 233 | 14 | 4 | 39 |
| 2001 | 26 | 4 | 19 | 3 | 0 | 9 |
| 2002 | 22 | 6 | 9 | 7 | 0 | 0 |
| 2003 | 3 | 0 | 2 | 1 | 0 | 2 |
| 2004 | 27 | 4 | 20 | 3 | 4 | 20 |
| 2005 | 6 | 2 | 4 | 0 | 2 | 4 |
| 2006 | 3 | 1 | 2 | 0 | 1 | 2 |
| 2007 | 4 | 3 | 1 | 0 | 3 | 1 |
| 2008 | 650 | 142 | 457 | 51 | 25 | 48 |
| 2009 | 833 | 85 | 732 | 16 | 63 | 84 |
| 2010 | 1,355 | 178 | 1,144 | 33 | 84 | 13 |
| 2011 | 1,118 | 150 | 1,100 | 18 | 80 | 26 |

The existing captive broodstock program has conserved[6] and stabilized the population and prevented an almost certain extinction of this species in Idaho. The adoption of state-of-the-art artificial propagation techniques for the conservation of endangered stocks allowed the program to produce large numbers of spawnable fish in the first generation and rapidly increase the abundance of offspring available for restoration releases in the Sawtooth Valley lakes.

## II. Springfield Sockeye Hatchery Master Plan for the Snake River Sockeye Program

As outlined above, the program is supported by a variety of facilities in three states. Adult collection facilities are in the upper Salmon River watershed; incubation and rearing facilities are at Eagle and Sawtooth hatcheries in Idaho, at the Manchester Research Station and Burley Creek Hatchery in Washington, and at Oxbow Hatchery in Oregon.

The Springfield Hatchery Master Plan, as reviewed and approved by the Council on April 12, 2011, addressed the next phase in the Snake River Sockeye Captive Brood Program through construction of a new sockeye smolt production hatchery and implementation of associated program management goals. The first phase of the program, the captive broodstock phase (Phase 1), has achieved sufficient success that the IDFG is proposing to initiate the next phase of population re-colonization (Phase 2). To address this next phase in recovery, increased production capacity is required to accomplish re-colonization of Sawtooth Basin lakes. The proposed Springfield Hatchery will not only centralize the production of sockeye, but also provide the needed flexibility to meet the capacity needs of the recovery effort. In the long term, the IDFG goal is to re-establish a natural population (i.e., local adaption phase) that can be de-listed and even provide treaty and sport harvest opportunities.

[5] Adult returns from natural production from Redfish, Alturus, and Pettit lakes.

[6] To date, the Snake River sockeye program's goal has been to conserve and slow the loss of the genetic diversity and prevent extinction. In fact, program genetic protocols have maintained over 95 percent of the original genetic diversity of the founding populations.

The biological goal described in the Master Plan is to increase the number of adults spawning naturally in the basin. The survival boost afforded by sockeye smolt releases from the proposed Springfield Hatchery is expected to produce adults in excess to the broodstock needs that would be used for this purpose. Currently, NOAA-Fisheries' interim delisting criteria for this population is 2,000 naturally produced sockeye over at least two consecutive generations. To meet draft NOAA Fisheries recovery criteria, 1,000 of these fish must be produced in Redfish Lake and 500 each in two additional lakes. IDFG proposes to achieve the 500 adult fish escapement target in Pettit and Alturas lakes, although it is important to note that actions in Alturas Lake[7] would be delayed pending completion of the formal recovery plan, anticipated in 2014.

The phased approach designed by IDFG is based on key criteria and escapement triggers that are built on the success of the current captive broodstock phase. The next phase outlined in the Master Plan is the local adaption phase (Phase 3) based on the production potential of the three key nursery lakes. The rationale behind this approach will ensure that the critical life history diversity and past efforts are respected.

In the re-colonization phase, the existing captive broodstock program will be transitioned to conventional hatchery production that uses anadromous adults as broodstock. Sufficient numbers of anadromous adults have been returning to begin developing this conventional hatchery program. The primary objectives of re-colonization will be for gene banking and generating anadromous adults to re-colonize available habitat. Adequate and consistent returns of anadromous adults will allow managers to eventually phase out the use of Redfish Lake captive broodstock (starting with the NOAA activities). Following success in Redfish Lake, re-colonization efforts will expand into Pettit and Alturas lakes.

Sockeye production will increase up to 1 million smolts (at 10-20 fish per pound). All fish released from the program will be marked by removal of the adipose fin. All fish are also genetically tagged (Parental-based tagging) and a portion PIT-tagged. These tags will allow managers to calculate harvest rates in fisheries and determine adult and juvenile survival rates through the FCRPS.

The 1 million sockeye smolts required for the re-colonization phase will be produced at the proposed Springfield Hatchery. Although this site is many miles from the Sawtooth Basin, it offers a number of advantages, such as having a high quality and available source of groundwater. In addition, hatchery effluent will not discharge to waters that support anadromous fish production, preventing potential viral and bacterial pathogens from hatchery operations entering streams that support ESA-listed populations. The preferred collection point for re-colonization-phase broodstock will initially be the Redfish Lake weir. Collecting fish here would prevent the program from collecting adults bound for Pettit and Alturas lakes. The re-colonization phase may also include the collection of anadromous adults at Lower Granite Dam;

[7] Information generated for Alturas Lake *O. nerka* suggests the possible presence of a remnant, native population that is genetically unique from anadromous and residual populations found in Redfish Lake. Because maintaining this diversity and capturing the benefits of local adaptation are critically important, the IDFG recommends proceeding cautiously when it comes to identifying an appropriate donor stock for Alturas Lake recovery efforts. Ultimately, actions will need to be consistent with NOAA's recovery plan for Snake River sockeye salmon (anticipated in early 2014).

this strategy is currently being evaluated as one possible means to increase the total number of potential spawners returning to the Sawtooth Basin.

*Facilities*

The proposed sequencing of the Snake River sockeye program from a captive broodstock program to the re-colonization phase and finally to the local adaptation phase in available habitats will require increasing the available rearing space for smolt production. The proposed method for this transition is to produce significant numbers of adults in excess to broodstock needs. The proposed smolt program at the Springfield Hatchery would be capable of meeting the up to the 1 million smolt goal identified in the FCRPS Biological Opinion and in the Idaho Fish Accord.

Program expansion at the Eagle Fish Hatchery was completed (2009) and modifications are currently underway at NOAA facilities to accommodate the increased number of captive spawners needed to source a Springfield smolt production program[8]. Captive broodstock rearing would be increased to approximately 1,000 – 1,200 adults annually to provide the estimated 1,300,000 eyed eggs needed to source both Springfield and existing in-basin release strategies.

As identified in the Springfield Sockeye Hatchery Master Plan and refined as part of the combined Step 2 and Step 3 review process, the new facilities required to accomplish this include a new hatchery building with offices, lab, restrooms, storage areas, vehicle maintenance, egg incubation stacks, and 22 indoor early rearing troughs. In addition, 22 outdoor raceways, a small pole building, three new residences for operators, and the refurbishing an existing residence into a bunkhouse for seasonal workers is part of the proposal.

As the number of returning anadromous adults increase over time in the re-colonization phase operations, captive broodstock production would decrease as spawning protocols begin to incorporate a greater number of anadromous spawners (ultimately transition to a "conventional" hatchery program using anadromous adults as broodstock). As this transition occurs, the existing brood facilities would be transitioned from NOAA facilities first, then the captive broodstocking efforts at Eagle Fish Hatchery; all captive broodstocking activities could potentially be eliminated when the five-year running average of hatchery- and natural-origin anadromous adults to the Sawtooth Basin exceeds 2,150 adults.

## III. Major Project Review (The Three-Step Process)

On December 12, 2010 the Council received a Master Plan from Idaho Department of Fish and Game intended to initiate the review process (i.e., Major Project Review) associated with a proposed hatchery master plan. The Master Plan (Step 1- conceptual phase) was titled

[8] On June 14, 2006 and August 14, 2007 the Council approved within-year requests for Eagle Fish Hatchery and ODFW Oxbow Hatchery modifications (addressing insufficient infrastructure to support the existing production objective) to meet the expectations of the FCRPS BiOp and the UPA for the Redfish Lake sockeye salmon. NOAA modifications were addressed as part of the process that consolidated the projects and addressed the UPA needs in 2008.

*Springfield Sockeye Hatchery Master Plan for the Snake River Sockeye Program* and is a component of Project 2007-402-00, *Snake River Sockeye Captive Propagation*.

On December 22, 2010 the Master Plan and the associated support documents were submitted to the Independent Scientific Review Panel (ISRP) for review, and on February 7, 2011 the ISRP provided its review summary and recommendation (ISRP document 2011-2). The ISRP found that the master plan met scientific review criteria "qualified."

The ISRP found the Master Plan to be well written and addressed a challenging situation in the recovery of these endangered species. Though the ISRP found the master plan met review requirements for proceeding to the following steps, the panel requested responses to six qualifying issues during the next review:

1. Clarify the plan for using anadromous hatchery, natural, and captive-reared adults for escapement and production at Springfield Hatchery during the transition from the proposed conservation phase to the re-colonization phase.

2. Provide a comparison of the program with release goals and explain the justification for the preferred alternative in terms of achieving the recovery and restoration goals of the anticipated Snake River sockeye recovery plan.

3. Discuss the characteristics ("quality") of the smolts to be produced and what will constitute a smolt with survival capability in terms of ecological fit?

4. Additional detail and understanding is needed to justify a plan for natural escapement when hatchery and natural adults are in the range of 800 to 1,200 fish.

5. Develop an experimental management plan, with sufficient monitoring, to evaluate lake carrying capacity. This should be incorporated into the trigger points and decision framework for determining smolt release numbers, natural escapement targets, and PNI.

6. The ISRP recommends that other species not be reared in the facility, in order to restrict opportunities for disease transmission.

On April 12, 2011, based on the ISRP review, the Council approved the Master Plan (Step 1) associated with the Springfield Sockeye Hatchery for the Snake River Sockeye Program. This recommendation was conditioned on the requirement that the IDFG address the six issues raised by the ISRP as part of the future step submittal.

On April 26, 2012, the Idaho Department of Fish and Game (IDFG) submitted to the Council, in accordance with the Council's Major Project Review and past decisions documents intended to address the combined Step 2 and Step 3 review requirements for the Springfield Hatchery Sockeye Program, as part of Project #2007-402-00, *Snake River Sockeye Captive Propagation*.

On May 23, 2012, the ISRP provided their review (ISRP document 2012-7) to the Council. The ISRP found the combined Step 2 and Step 3 submittal adequately addressed the review requirements stating that the project *Meets Scientific Review Criteria (Qualified).*

**ANALYSIS**
Though the ISRP found the information received met review criteria they qualified their review by requesting additional clarification and justification regarding three of the issue raised in their previous review (i.e., 1, 4 and 5). The qualifications were summarized as follows.

- the transition from Phase 1 - Captive Broodstock to Phase 2 - Re-introduction Program Scale (1 million smolts)
- Redfish Lake broodstock collection
- experimental management

Additional review comments provided by the ISRP associated with the qualifications provide additional understanding to the details the ISRP are requesting (e.g., Issue #2).

The ISRP states that these qualification should be addressed prior to the anticipated commencement of culture activities at the Springfield Hatchery (December 2013), but the initial construction activities in July 2012 should not be delayed.

As the ISRP noted in their current review the IDFG has drafted a plan for the Springfield Hatchery that represents a great deal of work and that their intentions with the qualifications (*additional considerations*) are just to make the plan that much better. The ISRP's review is very specific on edits and additional details needed to the plan and IDFG expects to address them and submit to the ISRP prior to March 2013.

Based the current and previous ISRP reviews and the quality of the plans submitted the Council recommends to Bonneville the construction and implementation of the Springfield Sockeye Hatchery. This recommendation is conditioned on IDFG providing the additional detail and clarity to the planning documents prior to the first sockeye eggs being received at the new hatchery in December 2013.

**Attachment 1: Ten year summary of cost to date and future costs, Fiscal Year 2010 to Fiscal Year 2022[9].**

| Program Area | Fiscal Year | | | | |
|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 - 2022 |
| **A. Land Purchases, Leases and Easements** | | | | | |
| A.1. Land Purchases, Leases and Easements | $4,750,000 | | | | |
| **B. Planning and Design** | | | | | |
| B.1. Step 1: Concept Engineering, Planning | $202,500 | | | | |
| B.2. Step 2: Prelim Engineering, Planning, Environmental Compliance | | $174,574 | $261,862 | | |
| B.3. Step 3: Final Engineering, Planning | | | $566,393 | | |
| **C. Construction** | | | | | |
| C.1. Estimated Construction Costs | | | $4,073,966 | $9,505,920 | |
| **D. Capital Equipment** | | | | | |
| D.1. Capital Equipment | | | | $102,110 | |
| **E. Environmental Compliance** | | | | | |
| E.1. Environmental Compliance | | $35,038 | $70,076 | $35,038 | |
| **F. Operations and Maintenance** | | | | | |
| F.1. Springfield Hatchery Programs | | | | $550,059 | $563,810 - $686,948 |
| **G. Monitoring and Evaluation** | | | | | |
| G.1. Monitoring and Evaluation Program | | | | | $143,806 - $175,214 |
| **Total Estimated Capital Costs** | $4,952,500 | $209,612 | $4,972,296 | $9,643,068 | |
| **Total Estimated Expense Costs** | | | | $550,059 | $707,616 - $862,162 |

**Notes and Assumptions:**

- A.1. Land Purchases, Leases and Easements
- B.1. Step 1 Planning (based on current expenditures to complete planning)
- B.2. Step 2 Planning based on percentage of estimated construction costs (escalated to FY 2011 dollars)
- B.3. Step 3 Planning based on percentage of estimated construction costs (escalated to FY 2012 dollars)
- C.1. Estimated Construction Costs assume 50% occurs in FY 2012 and 50% in FY 2013 (escalated from FY 2010 to mid FY 2012 dollars)
- D.1. Capital Equipment, estimated lump sum for equipment items not shown in construction estimate (escalated from FY 2010 to FY 2013 dollars)
- E.1. Estimated Environmental Compliance
- F.1. O&M Cost Springfield Hatchery Program (costs escalated at 2.5% annually from 2012 dollars) assumes start-up in FY 2013
- G.1. Monitoring and evaluation program (costs escalated at 2.5% annually from 2012 dollars) assumes start-up in FY 2014



[9] The cost reflects only the Springfield facilities and does not reflect the other facilities (e.g., Manchester) and M&E costs (SBT) that are key aspects of the Snake River sockeye program.